World Business Council for Sustainable Development

WORLD RESOURCES INSTITUTE

The Greenhouse Gas Protocol Initiative

the foundation for sound and sustainable climate strategies

Scope 3 Accounting and Reporting Standard

Supplement to the GHG Protocol
Corporate Accounting and Reporting Standard

DRAFT FOR ROAD TESTING

JANUARY 2010

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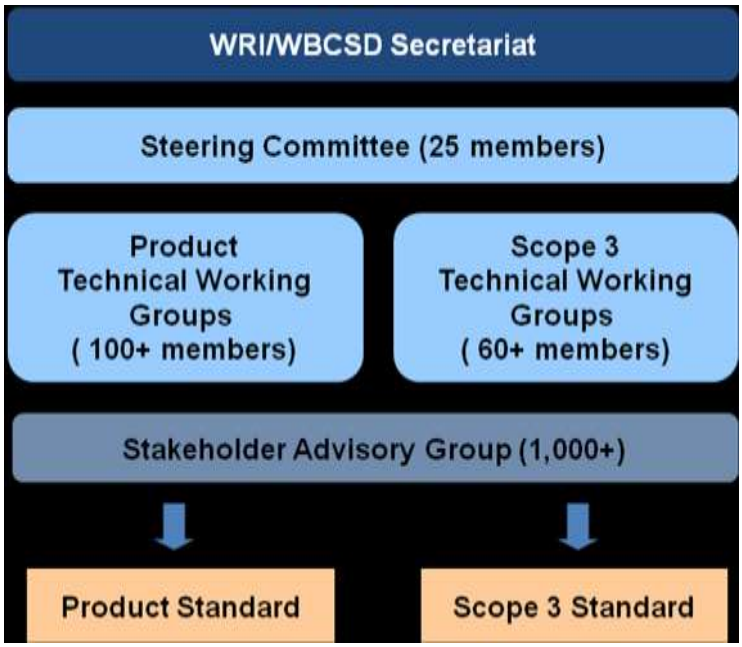
Introduction to Stakeholder Review Draft

Standard Development Process

The GHG Protocol Initiative follows a multi-stakeholder, consensus-based process to develop greenhouse gas accounting and reporting standards with participation from businesses, government agencies, nongovernmental organizations, and academic institutions from around the world.

This draft standard was developed between January and October 2009 by two technical working groups collectively comprised of over 70 members from a diversity of businesses, government agencies, NGOs, and academic institutions. The development was led and coordinated by WRI and WBCSD. A Steering Committee consisting of 25 organizations met three times between September 2008 and September 2009 to provide strategic and technical direction to the process.

Process Structure



Timeline

November 2007	✓ Survey and consultations to assess need for new standards
September 2008	✓ Steering Committee Meeting #1 (Washington DC) ✓ Technical Working Group Meeting #1 (London)
January 2009	✓ Working groups begin drafting
March 2009	✓ Steering Committee Meeting #2 (Geneva)
June 2009	✓ Technical Working Group Meeting #2 (Washington DC)
August 2009	✓ Stakeholder webinar and comment period
October 2009	✓ Steering Committee Meeting #3 (Washington DC)
November - December 2009	✓ First draft of standards released for stakeholder review ✓ Five stakeholder workshops (in Berlin, Germany; Guangzhou, China; Beijing, China; London, UK; Washington, DC, USA) ✓ Stakeholder comment period on first drafts
January - June 2010	▪ Road testing by over 40 companies
Summer 2010	▪ Public comment period on second drafts
December 2010	▪ Publication of final standards

Process for Revising the Draft Standard

In 2010, WRI and WBCSD, in collaboration with the Steering Committee and Technical Working Groups, will:

- Revise the draft standard based on feedback received during five stakeholder workshops and the stakeholder comment period (November 11 – December 21, 2009)
- Road test the draft standard with over 40 companies from a diversity of industry sectors and geographic locations during January to June 2010
- Revise the draft standard based on feedback received during road testing
- Circulate a second draft for public comment in mid-2010
- Revise the second draft based on feedback received
- Publish the final standard in December 2010

Part 1: General Requirements and Guidance for Scope 3 Accounting & Reporting

1. Introduction

The Greenhouse Gas Protocol Initiative (*GHG Protocol*) is a multi-stakeholder partnership of businesses, non-governmental organizations (NGOs), governments and others convened by the World Resources Institute (WRI), a U.S. based environmental NGO and the World Business Council for Sustainable Development (WBCSD), a Geneva, Switzerland-based coalition of over 200 international companies. Launched in 1998, the Initiative's mission is to develop internationally accepted accounting and reporting standards and guidelines for corporate greenhouse gas (GHG) emissions inventories and GHG projects, and to promote their use by businesses, governments, NGOs and other organizations.

The GHG Protocol Initiative has previously produced the following standards and guidelines:

- GHG Protocol *Corporate Accounting and Reporting Standard*[1] (2004)
- GHG Protocol for Project Accounting (2005)
- GHG Protocol *Land Use, Land-Use Change and Forestry Guidance for GHG Project Accounting* (2006)
- GHG Protocol *Guidelines for Quantifying GHG Reductions from Grid-Connected Electricity Projects* (2007)

The GHG Protocol launched a new initiative in 2008 to develop two new standards for:

- Product life cycle accounting and reporting
- Corporate scope 3 (value chain) accounting and reporting

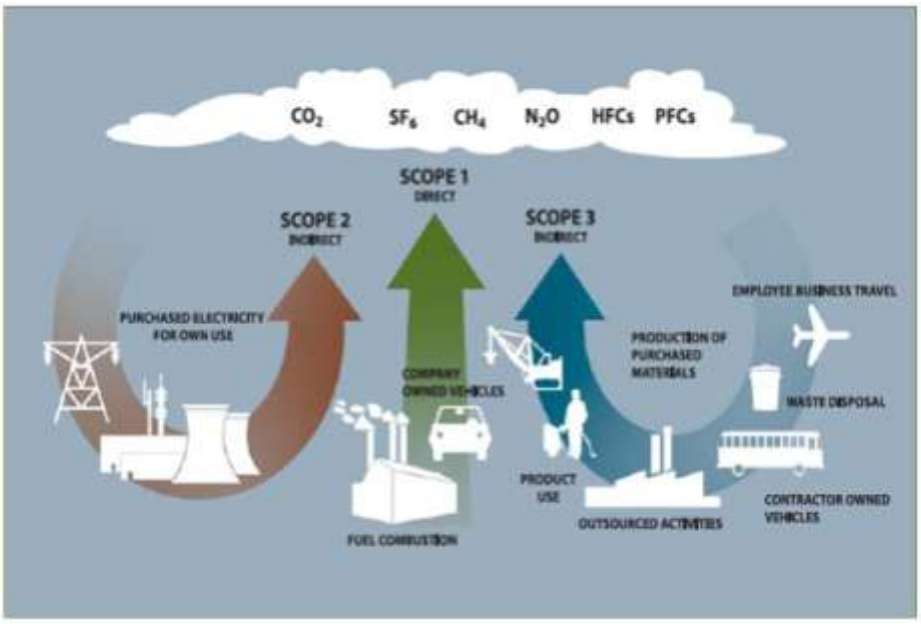
1.1 What is the motivation for new standards?

Since the launch of the *GHG Protocol Corporate Standard* in 2001 and its revision in 2004, business capabilities in the field of GHG accounting have grown significantly. Corporate leaders in this area are now adept at calculating emissions from GHG sources that they own or control (i.e., scope 1 emissions) and emissions from grid-sourced electricity and the other utility services of heat, steam and cooling (i.e., scope 2 emissions). See Figure 1 for an overview of the scopes.

[1] The GHG Protocol *Corporate Standard* is sometimes referred to as "the GHG Protocol." The term GHG Protocol is an umbrella term for the collection of standards, tools and other publications provided by the WRI/WBCSD GHG Protocol Initiative.

As accounting expertise has grown, so has the realization that significant emission sources linked to business activities are often outside scopes 1 and 2. These other indirect emissions are defined in the Corporate Standard as "scope 3," or other indirect emissions. There is increasing interest by reporting companies and increasing demand from stakeholders for scope 3 emissions to be accounted and reported.

Figure 1.1: Overview of Scopes 1, 2 and 3



Companies are increasingly looking beyond their own boundaries and developing strategies to reduce emissions in their value chains and in the products they make and sell. The new GHG Protocol standards provide standardized methods to inventory the emissions of corporate value chains, taking into account impacts both upstream and downstream of the company's operations. By taking a comprehensive approach to GHG measurement and management, businesses and policymakers can focus attention on the greatest opportunities to reduce emissions within the full value chain, leading to more sustainable decisions about the products companies produce, buy, and sell.

Many new drivers have emerged for scope 3 emissions reporting, including:

- Corporate GHG management and reporting moving beyond companies' own operations (i.e., scope 1 and 2), toward the full value chain to include upstream and downstream emissions (scope 3)
- Increasing focus on GHG emissions associated with production and consumption of goods and services
- Increasing awareness and management of climate-related risks in the value chain
- Stakeholder and investor requests for supply chain emissions and risk disclosure
- Increasing public reporting of scope 3 emissions
- Increasing business-to-business requests for GHG information through the supply chain
- Increasing emphasis on scope 3 emissions in corporate GHG management and reduction goals

Companies, investors and other stakeholders have called for standard approaches to accounting and reporting of scope 3 emissions due to the wide variety of emissions sources, calculation methods and lack of consistency of approach in scope 3 accounting.

Both business and external stakeholders benefit from converging on a common accounting and reporting standard for GHG inventories. As common principles and standards become widely used, companies facing GHG accounting issues for the first time will have an easier time in calculating their GHG inventories than if confronted with a variety of different approaches to consider. For business, it will reduce costs if their GHG inventory is capable of meeting both internal and external information requirements. For external stakeholders, the use of a common standard improves the consistency, transparency and accessibility of reported information, making it easier to track and compare progress over time.

Like the GHG Protocol *Corporate Standard*, the goal of this standard is to provide a consistent and robust reporting methodology to support GHG emissions transparency and management by companies worldwide.

1.2 The business value of a GHG inventory that includes scope 3 emissions

For some organizations, scope 3 emissions represent the largest category of emissions – and the largest source of GHG risks and opportunities. (*To be developed further*)

1.3 The process used to develop the standards

The GHG Protocol Initiative is a multi-stakeholder, consensus-based process with participation from businesses, policymakers, NGOs, academics and other experts and stakeholders from around the world. More than 1,000 stakeholders are involved in the process to develop this standard.

The work was led by the WRI and WBCSD in conjunction with a Steering Committee. Several technical working groups consisting of a diverse group of participants developed guidelines on specific accounting topics. Draft guidelines will be reviewed by a stakeholder advisory group at various stages of the standard development process; pilot tested by several companies in multiple countries; and open for public comment before being finalized.

1.4 Relationship to the GHG Protocol Corporate Standard

This *Scope 3 Accounting and Reporting Standard* is a supplement to the GHG Protocol *Corporate Accounting and Reporting Standard, Revised Edition* (2004) and is meant to be used in conjunction with the existing *Corporate Standard*. Under the *Corporate Standard*, companies are required to report all scope 1 and scope 2 emissions, while reporting scope 3 emissions is optional.

Companies reporting their GHG emissions following the GHG Protocol have two reporting options, portrayed in Figure 1.2 below:

Figure 1.2: Organization's Reporting Options

Report in Conformance with the GHG Protocol *Corporate Standard*	Report in Conformance with the GHG Protocol *Corporate Standard* and *Scope 3 Standard*
• Shall report all scope 1 and 2 emissions • May optionally report scope 3 emissions	• Shall report all scope 1 and 2 emissions • Shall report scope 3 emissions (following the requirements/ guidance in this standard)

Companies should make and apply decisions consistently between both standards. For example, the selection of a consolidation approach (equity share, operational control or financial control) should be applied consistently across scopes 1, 2 and 3.

1.5 Who should use this standard?

This standard is designed for companies and organizations of all sizes in all economic sectors. It is especially designed for companies with significant scope 3 emissions.

1.6 Relationship to GHG Protocol Product Life Cycle Standard

The GHG Protocol *Product Life Cycle Standard* was developed simultaneously within the same standard development process as this standard. The two standards are complementary. Companies are encouraged to use both standards to meet complementary but distinct goals. This standard contains standards and guidance for developing a corporate-wide inventory of GHG emissions throughout the value chain across all product categories and company activities. The *Product Standard* contains standards and guidance for developing a GHG inventory of a single product across its life cycle. For companies implementing both standards, a product level inventory will inform and support the development of a corporate-wide scope 3 inventory. (*To be developed further*)

1.7 GHG calculation tools

To complement the standard and guidance provided here, a number of cross-sector and sector-specific calculation tools are available on the *GHG Protocol* website (www.ghgprotocol.org). These calculation tools provide step-by-step guidance together with electronic worksheets to help companies calculate GHG emissions from specific sources or sectors.

1.8 Navigating your way through this document

This standard is divided into two parts. Part 1 provides general requirements and guidance for scope 3 accounting and reporting, applicable to all scope 3 emissions categories. The chapters in Part 1 are organized according to the steps companies should follow in accounting and reporting scope 3 emissions, such as defining business goals, mapping the value chain, setting boundaries, collecting data, calculating emissions, reporting emissions, etc.

Part 2 provides guidance specific to individual scope 3 categories. The chapters in Part 2 are organized by scope 3 categories, such as purchased goods and services, transportation and distribution, business travel, waste generated in operations, leased assets, use of sold products, etc. Each chapter in Part 2 provides a description of the category, guidance on determining relevant emissions for each category, guidance on calculating emissions for each category and case studies.

1.9 Terminology: Shall, should and may

The term "***shall***" is used in this standard to indicate what is required in order for a GHG inventory to be in conformance with the *GHG Protocol Scope 3 Standard*. The term "***should***" is used to indicate a recommendation, but not a requirement. The term "***may***" is used to indicate an option that is permissible or allowable.

1.10 Frequently asked questions

- *Example Question:* How do I set my boundaries for scope 3 emissions?
- *Example Response*: See Chapter 5 "Setting Boundaries"

1.11 Summary of Requirements in this Standard

Boundary Requirements (see Chapter 5 for more information):

Companies shall account for and report:

- Emissions from the largest scope 3 sources that collectively account for at least 80% of total anticipated scope 3 emissions (exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products));
- The use phase emissions of:
  - All sold products that consume energy (fossil fuels or electricity) in the use phase;
  - All sold fuels; and
  - All sold products that contain and emit GHGs in the use phase (see Part 2, Section 14 for more information); and
- All scope 1 and scope 2 emissions, as required by the GHG Protocol *Corporate Standard*.

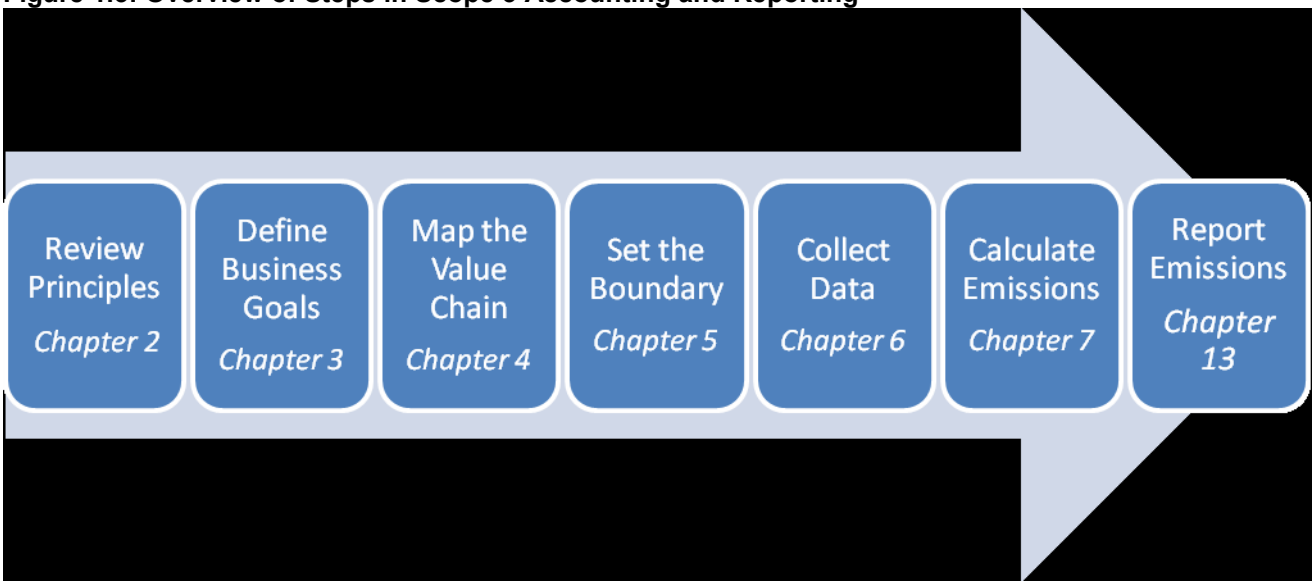
Companies should account for and report any other relevant scope 3 emissions.

Reporting Requirements (see Chapter 13 for more information):

A public GHG emissions report that is in accordance with the *GHG Protocol Scope 3 Standard* shall include the following information:

- A description of the company and inventory boundary, including an outline of the organizational boundaries chosen and the chosen consolidation approach
- The reporting period covered
- Total scope 1 emissions, total scope 2 emissions, and all required scope 3 emissions, separately reported for each scope
- Emissions data for all six Kyoto Protocol GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, SF_6), separately in metric tonnes and in tonnes of CO_2 equivalent
- Scope 3 emissions reported separately for each scope 3 category included in the inventory
- Methodologies used to calculate or measure emissions
- A description of the uncertainties of reported emissions data
- A list of scope 3 activities included in the report
- A description of the screening assessment approaches used and a description of their associated uncertainties
- A list of excluded scope 3 emission sources with justification of their exclusion
- Emissions data reported separately for activities calculated using primary data and activities calculated using secondary data, extrapolated data and proxy data
- A summary of data types used to calculate the inventory (e.g., the percentages of total scope 3 emissions calculated using primary data, secondary data, and extrapolated/ proxy data)

Figure 1.3: Overview of Steps in Scope 3 Accounting and Reporting



Each of these steps is described in detail in the following chapters.

2. Accounting and Reporting Principles

The GHG Protocol *Corporate Standard* provides the accounting and reporting principles that underpin and guide GHG accounting and reporting for scopes 1, 2 and 3 emissions.

The five accounting and reporting principles described in the table below are further elaborated in the GHG Protocol *Corporate Standard*.

- **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.

3. Business Goals and Inventory Design

The ultimate goal of scope 3 accounting and reporting is to reduce global GHG emissions by reducing emissions across corporate value chains.

Accounting and reporting of scope 3 emissions can serve a variety of business goals, including:

- **GHG management**, including identifying GHG reduction opportunities in the value chain; guiding investment and procurement decisions; cost containment; managing climate-related risks in the value chain including financial, regulatory, supply chain, product and technology, litigation, and reputational risks; etc.

- **Performance tracking**, including setting a baseline, setting GHG reduction goals, and tracking progress over time.

- **Engaging partners** in the value chain to expand GHG accountability, transparency and management throughout supply chains such that additional companies in the value chain (e.g. customers, suppliers, service providers, etc.) manage their scope 1, 2, and 3 emissions.

- **Public reporting** of GHG emissions to inform and meet the decision-making needs of stakeholders (e.g., policy-makers, investors, purchasers, customers, suppliers, employees, NGOs, etc.), as well as participation in corporate-level GHG reporting programs and registries.

Guidance on defining business goals

- *To be developed*

Case studies *(to be developed)*

- *Examples of companies reporting scope 3 emissions and their business goals (from different sectors and with different business goals).*

4. Mapping the Value Chain

After defining the company's business goals, the next step in accounting for GHG emissions is to map the value chain. To the extent possible, companies should create a complete process map and/or a complete list of sources and activities in the company's value chain.[2] The purpose of mapping of the value chain is to identify the full range of possible scope 3 activities before a company determines which are most relevant and should be included in the scope 3 inventory.

To the extent possible, the process map and/or list of sources should reflect the complete value chain, including:

- All suppliers and customers;[3]
- All inputs (purchased goods and services) and outputs (sold goods and services); and
- All scope 3 activities, such as production of purchased goods and services, transportation & distribution of purchased and sold products including warehousing and retail, outsourced activities, waste disposal, use & disposal of sold products, business travel, employee commuting, etc.

Refer to Table 4.1 below for a list of the 16 categories of scope 3 emissions.

4.1 Introduction to Upstream and Downstream Emissions

This standard divides scope 3 emissions into upstream and downstream categories to help companies better understand their scope 3 emissions, to avoid double counting between companies in a supply chain, and to increase the consistency of reported GHG inventories. The distinction between the two categories is based on the financial transactions of the company. Upstream emissions are those related to purchased goods and services. Downstream emissions are related to sold goods and services.

- Upstream emissions are the emissions that occur in the life cycle of inputs (i.e., purchased or acquired goods, services, materials, and fuels), up to the point of receipt by the reporting company.[4]

- Downstream emissions are the emissions that occur in the life cycle of outputs (i.e., sold goods and services) subsequent to sale by the reporting company.

- Other scope 3 emissions are limited to employee activities such as commuting, which are neither purchased nor sold.

[2] Companies should strive for completeness in mapping the value chain, but it is acknowledged that a 100% complete process map and/or list of sources, suppliers, customers, etc. may not be feasible.
[3] Because supply chains are dynamic and a company's suppliers and customers can change frequently throughout the reporting year, the list of suppliers and customers may represent a fixed point in time such as December 31 of the reporting year or a representative average over the course of the reporting year.
[4] Upstream activities include external services used for the reporting company's production, e.g. disposal of waste generated in own operations, third party transportation and distribution, etc.

Figure 4.1: Overview of Upstream and Downstream Emissions

Figure 4.2: Overview of Emissions Across the Value Chain

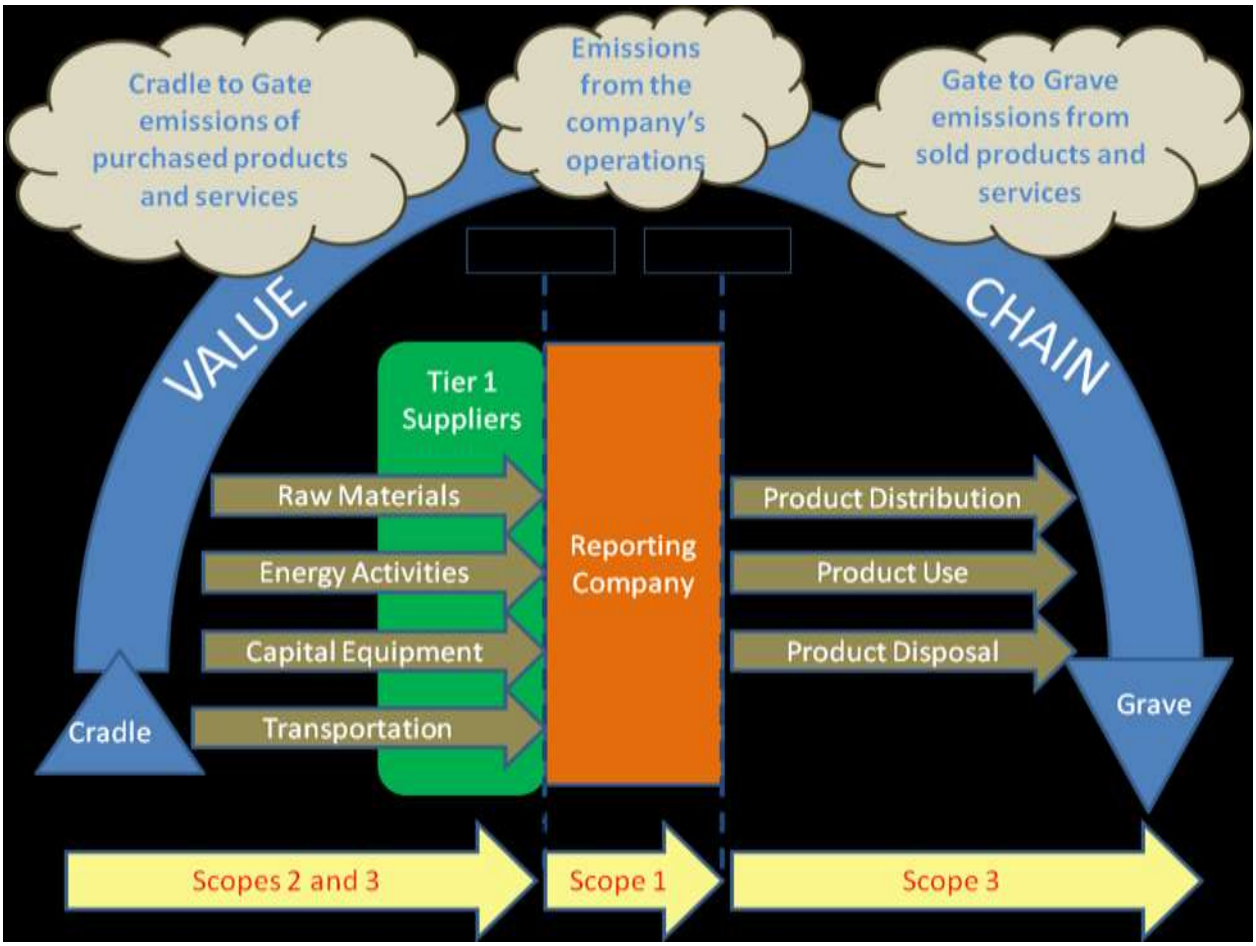

Cradle to Gate emissions of purchased products and services
Emissions from the company's operations
Gate to Grave emissions from sold products and services
VALUE
CHAIN
Tier 1 Suppliers
Raw Materials
Energy Activities
Capital Equipment
Transportation
Reporting Company
Product Distribution
Product Use
Product Disposal
Cradle
Grave
Scopes 2 and 3
Scope 1
Scope 3

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Figure 4.1: Emitting Activities and Scopes Across a Value Chain

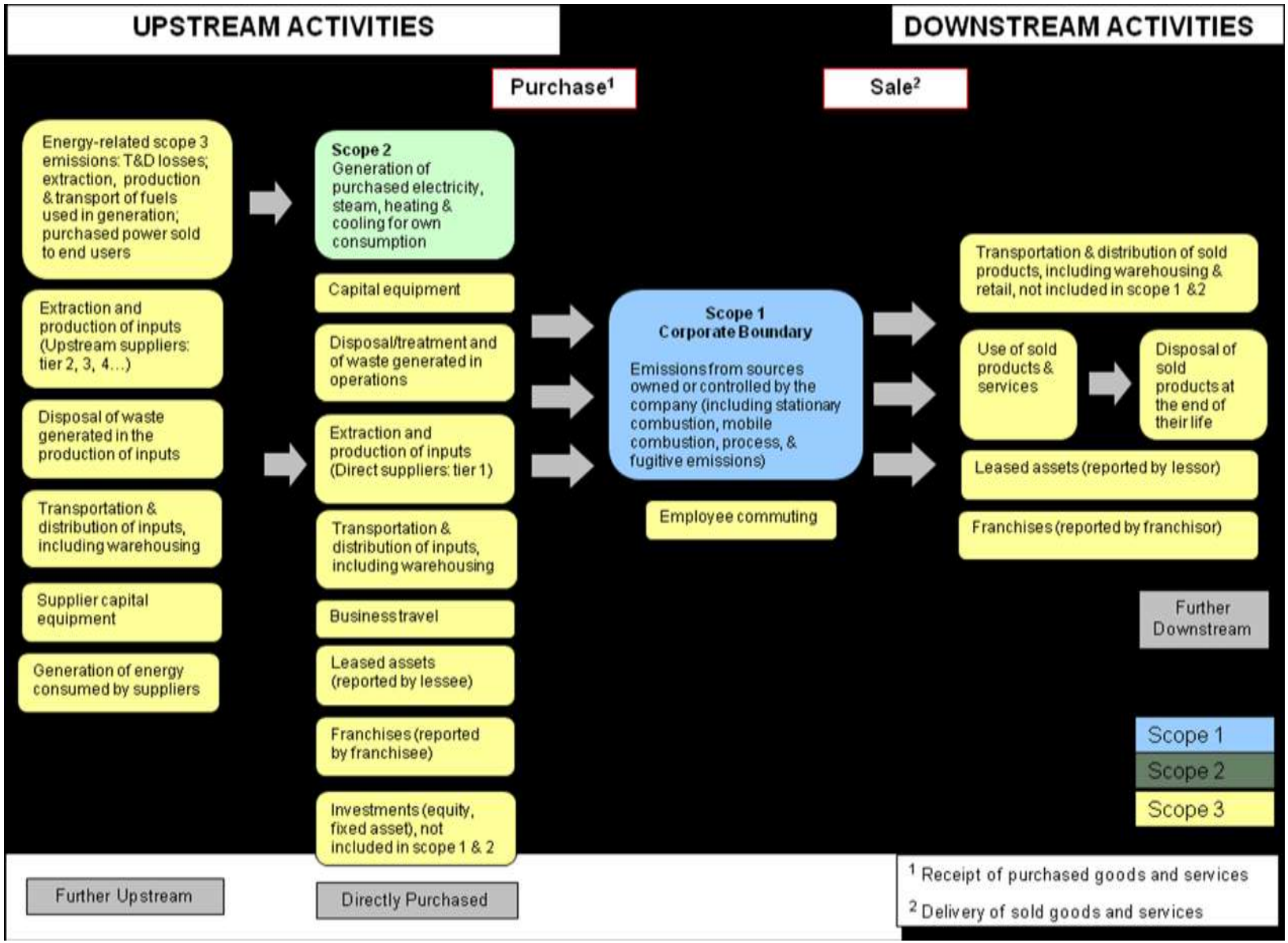


Table 4.1: Categorization of Scope 3 Emissions

	Category	Scope 1 Emissions of…	Source Description
Upstream Scope 3 Emissions from Purchased Products	1. Purchased Goods and Services – Direct Supplier Emissions*	Direct suppliers -Tier 1	• Scope 1 and 2 emissions of a reporting company's direct (tier 1) suppliers, including outsourced activities, (e.g., contract manufacturing, data centers, outsourced services, etc.)
	2. Purchased Goods and Services – Cradle-to-Gate Emissions*	Suppliers - Tiers 1, 2, 3, 4…	• Extraction and production of inputs (i.e., purchased or acquired goods, services, materials, or fuels) associated with all suppliers upstream (tiers 1, 2, 3, 4, etc.) • Generation of electricity, steam, heating, and cooling that is consumed by tiers 1, 2, 3, 4… suppliers • Disposal/treatment of waste generated in the production of inputs (i.e., purchased or acquired goods, services, materials or fuels) associated with tiers 1, 2, 3, 4… suppliers • Transportation and distribution of inputs associated with all suppliers upstream (tiers 1, 2, 3, 4, etc.) • Manufacturing/construction of tiers 1, 2, 3, 4… suppliers' capital equipment
	3. Energy-Related Activities Not Included in Scope 2	Energy suppliers - e.g. electric utilities, fuel producers	• Extraction, production, and transportation of fuels consumed in the generation of electricity, steam, heating and cooling (either purchased or own generated by the reporting company) • Generation of electricity, steam, heating, and cooling that is consumed in a T&D system (reported by end user) • Purchase of electricity, steam, heating, and cooling that is sold to an end user (reported by utility company or energy retailer)
	4. Capital Equipment	Capital equipment suppliers	• Manufacturing/construction of capital equipment owned or controlled by the reporting company
	5. Transportation & Distribution	Transportation suppliers/ logistics providers	• External transportation and distribution of inputs (i.e., purchased or acquired goods, services, materials or fuels), including intermediate (inter-facility) transportation & distribution, associated with direct (tier 1) transportation/logistics suppliers • Warehousing & storage of inputs (i.e., purchased or acquired goods, services, materials or fuels), associated with direct suppliers • Transportation of waste generated in operations
	6. Business Travel	Transportation suppliers, e.g. airlines	• Employee business travel
	7. Waste Generated in Operations	Waste management suppliers	• Disposal/treatment of waste generated in operations
	8. Franchises	Franchisor	• Operations of franchisor not included in franchisee's scope 1 and 2 (reported by franchisee)
	9. Leased Assets	Lessor	• Manufacturing/construction and operation of leased assets not included in lessee's scope 1 and 2 (reported by lessee)
	10. Investments	Company Receiving Investment	• GHG emissions associated with investments, including fixed asset investments and equity investments not included in scope 1 and 2

Downstream Scope 3 Emissions from Sold Products	11. Franchises	Franchisee	• Manufacturing/construction and operation of franchises not included in franchisor's scope 1 and 2 (reported by franchisor)
	12. Leased Assets	Lessee	• Manufacturing/construction and operation of leased assets not included in lessor's scope 1 and 2 (reported by lessor)
	13. Transportation & Distribution	Transportation/logistics providers, retailers	• Transportation and distribution of sold products, including warehousing and retail
	14. Use of Sold Products	Consumers	• Use of sold goods and services
	15. Waste	Waste management companies	• Disposal of sold products at the end of their life
Other Scope 3 Emissions	16. Employee Commuting	Employees	• Employees commuting to and from work • Employee teleworking

* Not otherwise included in categories 3-10

5. Setting the Boundary

5.1 Prioritizing Relevant Emissions

After mapping the value chain, companies should identify which scope 3 emissions are most relevant for the company. Companies should prioritize scope 3 activities based on their relative size and significance, with a view to prioritizing those scope 3 activities where the most significant GHG emissions and reduction opportunities lie. These emissions sources are expected to be the focus of a company's GHG scope 3 reporting and reduction efforts.

Companies shall account for and report all relevant scope 3 emissions of the reporting company.

Following the principle of relevance, companies should 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.

The reported inventory must be relevant to the reporting company as well as to the company's stakeholders and the users of reported emissions data.

Which scope 3 activities are most relevant differs by industry sector and by reporting company depending on where a company's largest value chain GHG impacts lie (e.g., purchased materials, external transportation and distribution, use of sold products, business travel, etc.). As a result, a determination of relevance must be made on a company-by-company basis.[5]

Companies shall assess the relevance of each scope 3 category to determine whether each category must be reported. Companies shall report emissions for each scope 3 category determined to be relevant. Companies may additionally report emissions for other scope 3 categories.

In general, sources and activities the company targets for GHG emission reductions should be accounted for and reported in the inventory. Doing so will allow the company to track and demonstrate progress toward its GHG reduction goals.

5.2 Prioritizing Relevant Emissions Based on Size

Scope 3 activities shall be considered relevant if they are large (or expected to be large) compared to the reporting company's other sources of emissions.

Companies should calculate initial estimates of all sources to gain a basic understanding of the relative contributions of various scope 3 activities. Whether an individual scope 3 activity is significant in size is a function of:

- Total anticipated scope 3 emissions, and
- The emissions from any single scope 3 activity.

Initial estimates should be conducted for each individual scope 3 category and rolled up to obtain an estimate of total anticipated scope 3 emissions.

Each category of scope 3 emissions involves a separate screening method to estimate emissions. Part 2 of this standard provides guidance on the use of screening methods and relevance tests for each scope 3 category.[6]

To determine which scope 3 activities are most significant in size, companies should follow these steps:

[5] Industry sectors may also coordinate to define common scope 3 activities that should be reported within a sector.
[6] Part 2 provides both emissions-based screening methods (based on estimated GHG emissions) and financial-based screening methods (e.g., based on purchase spend) for various scope 3 categories.

1. Use screening methods to individually estimate the emissions from all scope 3 activities. See Part 2 of this standard for examples of screening methods by scope 3 category.[7]
2. Express each individual scope 3 activity's estimated emissions as a fraction of total anticipated scope 3 emissions.
3. Rank all scope 3 activities from largest to smallest to determine which activities are most significant.

Companies shall account for and report:

- Emissions from the largest scope 3 sources that collectively account for at least 80% of total anticipated scope 3 emissions (exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products));
- The use phase emissions of:
  - All sold products that consume energy (fossil fuels or electricity) in the use phase;
  - All sold fuels; and
  - All sold products that contain and emit GHGs in the use phase (see Part 2, Section 14 for more information); and
- All scope 1 and scope 2 emissions, as required by the GHG Protocol *Corporate Standard*.

Companies should disclose the percentage of total anticipated scope 3 emissions that has been accounted for and reported.

5.3 Prioritizing Relevant Emissions Based on Other Criteria

In addition to accounting for all activities that collectively account for 80% of total anticipated scope 3 emissions in terms of size[8], companies should consider other criteria to determine whether additional scope 3 activities should be accounted for and reported.

Scope 3 activities should be considered relevant if they meet any of the following criteria:

1. There are potential emissions reductions that could be undertaken or influenced by the company
2. They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and technology, compliance/litigation, reputational and physical risks)
3. They are deemed critical by key stakeholders (e.g., feedback from customers, suppliers, investors or civil society)
4. They are an outsourced activity that is typically insourced by other companies in the reporting company's sector
5. They meet additional criteria developed by the company or industry sector

5.3.1 Level of Influence

In addition to the largest scope 3 activities, companies should prioritize and report scope 3 activities over which they can exert influence and achieve GHG emission reductions.

By definition, scope 3 emissions are not owned or controlled by the reporting company, but are the scope 1 and 2 emissions of other companies such as suppliers, customers, waste management companies, shipping companies, etc. Nevertheless, scope 3 emissions are a consequence of the activities of the reporting company and companies often have the ability to influence GHG reductions upstream and downstream of their operations.

Companies should assess their levels of influence over the scope 3 activities identified in the value chain mapping process and rate them according to their ability to influence GHG reductions. Activities over which the reporting company has the ability to influence reductions should be reported even if it falls below the significance threshold established in section 5.2.

[7] Part 2 also provides financial-based screening methods as an alternative to emissions-based screening methods.
[8] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

Table 5.1 provides an illustrative list of actions that companies can take to influence reductions in the value chain.

Table 5.1: Examples of Actions to Influence Scope 3 Reductions

Scope 3 Activity	Examples of Actions to Influence Reductions
Purchased goods and services - Direct supplier emissions	• Partner with suppliers to increase energy efficiency in their operations • Give preference to low GHG emitting suppliers over high GHG emitting suppliers • Include GHG reduction targets and policies in contractual agreements • Organize low-carbon supply chain partnerships, involving the whole value chain
Purchased goods and services – Cradle-to-gate emissions	• Substitute away from high GHG emitting raw materials toward low GHG emitting raw materials • Implement low-GHG procurement/purchasing policies • Encourage tier 1 suppliers to engage their tier 1 suppliers (i.e., the reporting company's tier 2 suppliers) and disclose these scope 3 emissions to the customer in order to propagate GHG reporting through the supply chain
Transportation and distribution of purchased goods	• Source materials from nearer locations if leads to net GHG reductions • Substitute toward lower emitting modes (e.g. marine transport) and away from higher emitting modes (e.g. air transport) • Optimize efficiency of transportation and distribution
Disposal of waste generated in operations	• Reduce tons of waste generated in operations • Implement re-use and recycling measures that lead to net GHG reductions
Employee commuting	• Locate offices/facilities near urban centers and public transit facilities • Create incentives for public transportation and disincentives for commuting by car • Reduce the number of days worked per week (e.g., 4x10 schedule instead of 5x8)
Business travel	• Encourage video conferencing and web-based meetings as an alternative to in-person meetings • Encourage more efficient travel, such as non-stop flights
Use of sold products	• Develop new low- or zero-emitting products • Increase the use phase energy efficiency of energy-consuming goods • Substitute away from products that contain GHGs • Decrease the use phase GHG intensity of the reporting company's product portfolio
Disposal of sold products	• Make products recyclable if leads to net GHG reductions • Implement product packaging measures that lead to net GHG reductions (e.g., decrease amount of packaging in sold products. develop new GHG saving packaging materials, etc.) • Implement re-use and recycling measures that lead to net GHG reductions

5.3.2 Risk exposure

Companies should identify additional scope 3 activities that contribute to a company's risk exposure. Climate change related risks include financial, regulatory, supply chain, product and technology, compliance/litigation, reputational and physical risks. Some scope 3 sources and activities not determined to be significant in size in section 5.2 are expected to contribute to a company's GHG risk exposure and should therefore be accounted for and reported in the inventory.

Table 5.2: **Examples of climate change related risks**

Type of Risk	Examples
Regulatory	Mandatory emissions reduction legislation
Supply chain	Suppliers passing higher GHG-related costs to customers; supply chain business interruption risk
Product and technology	Competitors developing energy-efficient or climate-friendly offerings
Litigation	Lawsuits charging negligence, public nuisance, etc.
Reputation	Consumer or stakeholder backlash; negative media coverage
Physical	Damage to assets through drought, floods, storms, etc.

5.3.3 Stakeholder requests

Companies should identify additional scope 3 activities that are priorities of external stakeholders (e.g., suppliers, customers, investors, civil society, etc.) and account for these activities in the inventory.

5.3.4 Outsourced activities

Companies should identify all outsourced activities that are typically insourced by other companies in the reporting company's sector. Such activities should be considered relevant scope 3 emissions and included in the inventory.

Companies should identify all outsourced activities that were previously done in-house. Such activities should be considered relevant scope 3 emissions and included in the inventory.

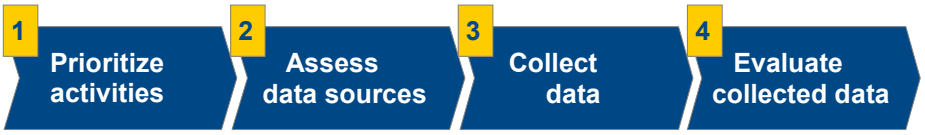
5.3.5 Additional criteria developed by the company or industry sector

Companies and their industry sectors should identify additional criteria for determining relevant scope 3 emissions that may be specific to the reporting company or the reporting company's sector. Additional scope 3 emissions should be included if determined to be relevant based on these criteria.

6. Collecting Data

After a company has identified its relevant scope 3 activities for inclusion in the boundary, the next step is to collect the necessary data to calculate a company's scope 3 emissions. This chapter provides a four step approach to collecting and evaluating data (see Figure 6.1).

Figure 6.1: Four-step process for collecting and evaluating data

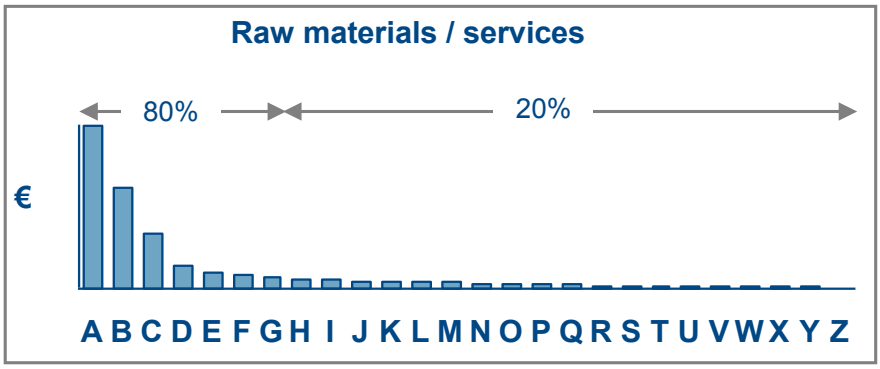


6.1. Prioritizing activities

Companies should collect data of the highest quality for each emissions source. However, the greatest effort should be focused on the activities that contribute most to total scope 3 emissions, based on the initial estimates calculated when setting the scope 3 boundary in Chapter 5.

Box 6.1: Example of Prioritizing Emissions from Purchased Goods and Services

When collecting data for purchased goods and services, a company may prioritize categories of purchased products by evaluating how much it spends on each purchase category. In the figure below, a company identifies the seven purchase categories (categories A-G) that collectively account for 80% of total emissions. Companies should also pay attention to smaller spend areas that may generate relatively high emissions.



6.2. Assessing data sources

Data includes directly measured emissions data, activity data and emission factors used to quantify emissions. The quality of reported emissions data depends on the quality of input data used to calculate emissions. The design of a corporate inventory system should facilitate the collection of high quality inventory data and the maintenance and improvement of collection procedures over time.

6.2.1 Available data types

There are two main types of data to use in calculating scope 3 emissions:

- Primary data
- Secondary data

Table 6.1: Types of Data

Primary Data	Direct emissions measurements or activity data collected from specific sources within a company's operations or its supply chain.	The reporting company surveys its suppliers and collects product-level data or scope 1 and 2 emissions data from specific facilities in its supply chain.
Secondary Data	Data that are not collected from specific sources within a company's operations or its supply chain. Secondary data include industry-average data, data from literature studies, and data from published databases.	Data from life cycle inventory databases, literature studies, environmentally-extended input-output models[9]; Intergovernmental Panel on Climate Change (IPCC) default emission factors; industry associations; etc.

When primary or secondary data of sufficient quality are not available, two estimation methods may be used to fill data gaps:

- Use of extrapolated data
- Use of proxy data

Table 6.2: Estimation Methods to Fill Data Gaps

Extrapolated Data	Primary or secondary data related to a similar (but not representative) input, process, or activity to the one in the inventory, which are adapted or customized to a new situation to make more representative (for example, by customizing the data to the relevant region, technology, process, temporal period and/or product).	There is secondary data available for electricity in Ukraine but not for electricity in Moldova. The company customizes the data for electricity in Ukraine to make it more representative of electricity in Moldova (e.g., by modifying the electricity generation mix).
Proxy Data	Primary or secondary data related to a similar (but not representative) input, process, or activity to the one in the inventory, which are directly transferred or generalized to the input, process, or activity of interest without being adapted or customized to make more representative.	There is secondary data available for electricity in Ukraine but not for electricity in Moldova. The company uses the data for electricity from Ukraine without modification as a proxy for electricity in Moldova.

[9] Input-output data are derived from environmentally extended input-output analysis (IOA) which is the method of allocating GHG emissions (or other environmental impacts) associated with upstream production processes to groups of finished products by means of inter-industry transactions. The main data sources for IOA are sectoral economic and environmental accounts. Economic accounts are compiled by a survey of facilities on economic inputs and outputs and tax data from individual establishments. Environmental accounts are derived from (surveyed) fossil fuel consumption by industry and other GHG sources compiled in national emission inventories

As a general rule, companies should apply the following hierarchy of data types in collecting data:

1. Primary data
2. Secondary data
3. Extrapolated data
4. Proxy data

When collecting primary data from value chain partners, companies should obtain the most product-specific data available, according to the following hierarchy:

1. Product-level data
2. Process-level data
3. Facility-level data
4. Business unit-level data
5. Corporate-level data

Companies shall disclose in the public report the types of data used to calculate the inventory.

Emissions calculated using primary data shall be reported separately from emissions calculated using secondary data, extrapolated data and proxy data.

Box 6.1: **Rationale for prioritizing the use of primary data**

There are several reasons for prioritizing primary (company-specific) data over secondary (industry average) data.

- Expanding primary data collection throughout the supply chain such that all companies engage their tier 1 suppliers will expand GHG transparency, accountability, and management throughout global supply chains and expand the number of individual actors involved in GHG management.

- Observed data reflect operational changes from actions taken to reduce emissions, whereas secondary data sources do not reflect operational changes undertaken by companies.

- Observed data provides transparency and accountability to the companies that have direct control over emissions sources and have the greatest ability to achieve reductions through operational changes.

In general, primary data should be collected for all sources and activities the company targets for GHG emission reductions. Collecting primary data will allow the company to track progress toward its GHG reduction goals.

Companies should to engage their tier 1 suppliers and encourage tier 1 suppliers to engage their tier 1 suppliers (the reporting company's tier 2 suppliers) to encourage a cascade of reporting throughout the supply chain. Requesting scope 1, scope 2, and scope 3 data from a company's suppliers will help expand the number of companies that are directly managing GHG emissions.

Table 6.3: Examples of Primary and Secondary Data by Scope 3 Activity

	Category	Primary Data (Company-Specific)	Secondary Data (Industry Average)
Upstream Scope 3 Emissions from Purchased Products	1. Purchased Materials and Services* – Direct (Tier 1) Suppliers	• Actual emissions data from suppliers' operations (either product-specific GHG data or scope 1 and 2 GHG data allocated to the product purchased based on mass, volume, revenue, etc.)	• N/A
	2. Purchased Materials and Services* – Cradle-to-Gate Emissions	• Product-level cradle-to-gate GHG data specific to the supplier purchased from	• Materials consumed x emission factors from published life cycle assessment (LCA) database
	3. Energy-Related Activities Not Included in Scope 2	• Actual T&D loss rate specific to grid • Actual power purchase data and emission rate for purchased power • Company-specific data on upstream emissions (e.g. extraction of fuels)	• Average T&D loss rate (e.g. national average) • Average power purchase data • Average data on upstream emissions (e.g. secondary LCA database)
	4. Capital Equipment	• Actual energy use data from capital equipment manufacturer	• Materials consumed x emission factors from published LCA database
	5. Transportation & Distribution	• Actual tonne/km traveled data from transportation/ logistics providers	• Estimated distance (tonne-km) traveled x default emission factors
	6. Business Travel	• Actual distance traveled x default emission factors	• Estimated distance traveled x default emission factors
	7. Waste Generated in Operations	• Actual emissions data from waste management companies	• Actual tonnes of waste generated x default emission factor
	8. Franchises	• Site-specific electricity use data	• Estimated emissions based on e.g. floor space by building type
	9. Leased Assets	• Site-specific electricity use data	• Estimated emissions based on e.g. floor space by building type
	10. Investments	• Site-specific emissions data	•
Downstream Scope 3 Emissions from Sold Products	11. Franchises	• Site-specific electricity use data	• Estimated emissions based on e.g. floor space by building type
	12. Leased Assets	• Site-specific electricity use data	• Estimated emissions based on e.g. floor space by building type
	13. Transportation & Distribution	• Actual tonne/km traveled data from transportation/ logistics providers	• Estimated distance (tonne-km) traveled x default emission factors
	14. Use of Sold Products	• *TBD*	• *TBD*
	15. Waste	• *TBD*	• *TBD*
Other Scope 3 Emissions	16. Employee Commuting	• Actual distance traveled x default emission factors	• Estimated distance traveled x default emission factors

1 * Not otherwise included in categories 3-10
2

6.2.2 Data Quality Criteria

Companies should assess data sources using the following criteria. All data quality indicators should be used to describe primary data, while technological, temporal and geographic representativeness are the most relevant for secondary data.

Companies should use the following criteria as a guide when choosing data sources to obtain the highest quality data available for a given emissions activity.

Table 6.4: Data Quality Criteria

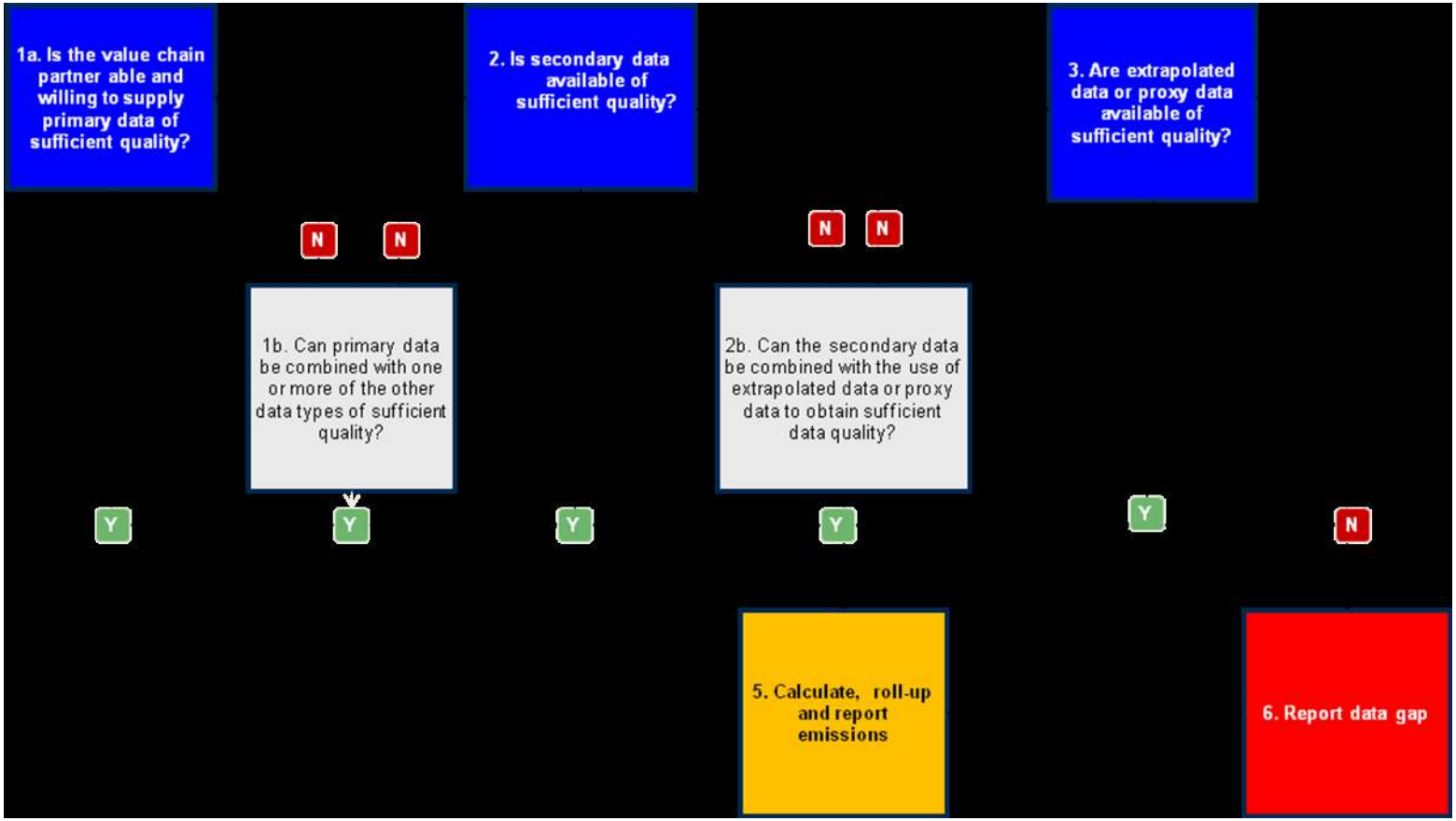
Criteria	Explanation
Technological representativeness	■ Degree to which the data set reflects the actual technology(ies) used
Temporal representativeness	■ Degree to which the data set reflects the actual time (e.g., year) or age of the activity or whether an appropriate time period is used (e.g., annual/seasonal averages may be appropriate to smooth out data variability due to factors such as weather conditions)
Geographical representativeness	■ Degree to which the data set reflects actual geographic location of the activity, e.g., country or site
Completeness	■ The degree to which the data represents the relevant activity ■ The percentage of locations for which site specific or generic data are available and used out of the total number that relate to a specific activity. Generally, a percent target is identified for the number of sites from which data is collected for each activity
Precision	■ Measure of the variability of the data points used to derive the GHG emissions from an activity (e.g., low variance = high precision). Relates mostly to where direct measurements have been used.

6.3. Collecting data

Companies should follow the decision tree in Figure 6.2 when choosing between primary data, secondary data, and extrapolated and proxy data.

Companies should apply the data quality criteria from Section 6.1 when determining the data quality of each data source. If data is unavailable or data quality is insufficient for a given activity, companies should move to the next data type in the decision tree.

Figure 6.2: Decision Tree for Collecting Data



6.3.1 Collecting primary data

Collect data using standardized formats: Companies should establish robust data collection formats that document the data sources to ensure the activity data is collected on an approved, consistent basis to allow year on year and partner to partner comparability. A standardized format reduces the risk of errors and provides transparent documentation to enable consistent recalculations. The data collection format should include:

- Description of emission sources and scope
- Boundary details
- Reporting period
- Comparability with previous years *(if using primary data)*
- Trends evident in data
- Progress towards targets *(if applicable)*
- Discussion of uncertainties
- Description of events impacting data
- GHG calculation methodologies
- Ratio indicators – *for basic allocation if required*
- Details of emission factors
- Details of data source

6.3.2 Use and Management of Confidential and Proprietary Data

There are any number of situations when collecting and using data in a scope 3 inventory where the data are considered confidential and/or proprietary to the provider of these data. Such source information can take several forms, from direct emission measurement data to indirect data sources from which emission data can be calculated or deduced.

Some organizations will provide data needed to perform GHG calculations without any use restrictions. Other organizations may require that the data provided be protected from disclosure and not used for any purpose other than that which is specified by the data provider. Frequently, use and disclosure of data considered to be confidential and proprietary is governed by some form of "confidentiality" or "non-disclosure" agreement. If so, specific terms of data use and disclosure are defined within the agreement. Violating breach of use and disclosure provisions in legally binding documents can have serious legal consequences, particularly if harm to the data source provider can be demonstrated as a result of unauthorized disclosure.

Whenever data that represent a specific organization are to be used for a scope 3 inventory, it is generally good practice to consult with the data provider to determine if there are any restrictions regarding data use and disclosure, regardless of how the data were obtained. It is also good practice to inform the data provider concerning how the data are to be used and ask for written permission to use them for that purpose. Any restrictions on use of data or further disclosure need to be respected.

Another issue related to confidentiality is compliance with legal regimes with respect to anti-competitiveness. The subject company can have multiple suppliers for similar components of products and similar services. Each supplier's data should be given the applicable standard of protection, subject to local laws and regulations.

Both the reporting company and the value chain partner should have in place and enforce:

- Applicable standards of data protection for their information assets, particularly with a view towards applicable protection for data used in implementing a Scope 3 greenhouse gas emissions reporting process

- Sound privacy practices that protect the data of its employees, customers, suppliers, and others, particularly with a view towards practices that protect the data used in implementing a Scope 3 greenhouse gas emissions reporting process.

- Applicable standards that enable compliance with anti-competitiveness laws in the relevant countries, particularly with a view towards practices that protect the data used in implementing a Scope 3 greenhouse gas emissions reporting process.

If the reporting company and the value chain partner do not have specific standards or practices in place, they should consider developing such standards and practices and develop agreements to enforce these standards and practices when implementing a scope 3 greenhouse gas emissions reporting process.

6.3.2 Collecting secondary data

6.3.3 Addressing Data Gaps

In most instances where data are missing, it should be possible to obtain sufficient information to provide a reasonable estimate of the missing data. Therefore, there should be few, if any, data gaps. The highest quality data should be used given resource constraints.

Identifying data gaps

Data gaps exist when there is no primary or secondary data that is specifically relevant to a given activity.

For example:

- Emissions factors or activity data may not exist for a specific activity
- Emissions factors or activity data may exist for a specific activity but has been generated in a different region
- Emissions factors or activity data may exist for a specific activity but has been generated using a different technology

Filling data gaps

Data gaps can be filled using:

- Extrapolated data, e.g., GHG emissions from the same or similar activities that have been customized to a new situation, e.g., region.
- Proxy data, e.g., GHG emissions from the same activity but from a different locality or produced using different technology or GHG emissions of a similar activity. This data is not modified in any way.

Where data gaps have been filled using one of the above options, companies should report the procedure(s) taken to fill the data gap. This will enable others to understand the steps taken to identify other avenues to find the new sources of data.

Extrapolation

Extrapolation refers to the adaptation or customization of an existing dataset to the conditions of the inventory being undertaken. Extrapolating data requires knowledge of both the existing situation and those for the current inventory. It is likely that extrapolation is likely to yield more accurate results than the use of proxy data.

Extrapolation can vary in the degree of customization applied. For example, adaptation of an existing dataset may be limited to changing the electricity mix to match the country in which an input/product is being manufactured. Alternatively more extensive adaptation may be applied where the key emissions attributes of the product impact are identified (e.g. for a laptop, these may include weight, area of printed circuit board, screen size, hard drive size, etc). An algorithm can subsequently be developed to apportion impacts related to those attributes. Identifying the key emissions attributes and the subsequent algorithm developed should be based on other relevant inventories for similar activities or stakeholder input where inventories do not exist.

Using proxy data

Proxy data relates to a similar (but not representative) input, process, or activity to the one in the inventory. Where data gaps exist, data relating to 'similar' activities can be used as 'proxy' or 'surrogate' data to fill these gaps. There are two ways to generate proxy data:

- Data transfer which is the application of data obtained in one situation to a different but similar situation. The key issue is how to define "similar," e.g., use of GHG emissions data from apple production for pears
- Data generalization which is generalizing specific product datasets to more generic product types, e.g., generalizing apples and oranges data to fruit

6.4. Evaluating Data Sources

6.5 Case studies

7 Allocating Emissions

7.1 Introduction

If different systems share a common process, the emissions associated with the shared process need to be divided between (allocated to) the systems sharing it. For example, if multiple customers purchase products from a common supplier manufacturing multiple products at one factory, the supplier's factory-level emissions should be allocated to its various products.

There are two common situations where this can occur:

- When a process has multiple outputs
- When a process has multiple inputs

Multi-output example: Companies performing scope 3 inventories will often have suppliers that make many products besides the ones purchased by the company. In this case, the suppliers' activity data or emissions data need to be allocated among the various products (i.e. multiple outputs) so that customers know the emissions attributable to the specific products they buy.

Multi-input example: To understand multi-input allocation, consider a company that makes component parts that are combined with component parts from other companies to make a final product. In this case, the scope 3 inventory of each component supplier should only include a portion of the emissions associated with using and disposing of the final product, meaning that these emissions must be allocated to the various component suppliers.

7.2 Avoid Allocation if Possible

Companies should avoid allocation if possible by obtaining product-level GHG data from value chain partners in conformance with the GHG Protocol *Product Standard*.[10]

When collecting primary data from value chain partners, companies should obtain the most product-specific data available, according to the following hierarchy:

1. Product-level data
2. Process-level data
3. Facility-level data
4. Business unit-level data
5. Corporate-level data

If product-level data is not available, companies should request GHG data from suppliers on the most disaggregated level available (e.g., process- or production line-level data, facility-level data, business unit-level data, etc.). For example, a customer may ask a supplier whether sub-metering if feasible for a facility that produces two products to obtain energy or emissions data separately for each production line.

[10] Refer to Chapter 8 of the GHG Protocol *Product Standard* for more information on allocation.

7.3 Allocation Methods

Companies should use one of the allocation methods provided in Table 7.1.

Table 7.1: Allocation Methods

Method	Definition
Physical Factors (e.g., mass, volume, energy, etc.)	Allocating the emissions of an activity based on an underlying physical relationship between the multiple inputs/outputs and the quantity of emissions generated.
Market Value	Allocating the emissions of an activity based on the market value of each output/product.

The allocation approach used in a scope 3 greenhouse gas inventory should be appropriate for the objectives of the inventory and adhere to the principles of relevance, accuracy, completeness, consistency and transparency.

The most appropriate allocation method depends on individual circumstances. Companies should use the most appropriate allocation method for a given circumstance. For example, when allocating emissions from freight transport, companies should allocate emissions according to mass or volume, depending on whether the capacity of the vehicle is limited by mass or volume.

If more than one allocation method is possible given the types of data available, it is good practice to perform sensitivity analysis using several allocation approaches, tested over a range of reasonable scenarios. For instance, even if mass-based allocation is the primary allocation method used, it may be helpful to examine how much difference it would make if market value were used instead, assuming a reasonable range of economic values.

The choice of allocation method will also depend on the types of information available. Some suppliers may develop allocated, cradle-to-gate data to characterize the specific materials purchased from them. More often, however, companies performing scope 3 inventories will find that the data from suppliers is limited to data aggregated at the production line, facility or corporate level.

Tables 7.2 and 7.3 describe the types of data that companies may encounter and outline factors to consider in selecting allocation methods suited to the various types of data.

Companies shall disclose the allocation methods used. Companies should justify the methods used where relevant.

Table 7.2: Allocation Methods Depending on Available Data

Type of Data Provided By Supplier	Allocation Method	
	Physical Relationships	Market Value
Product (Good or Service)	No allocation required	No allocation required
Production Line/Processes that produce multiple products/services	If data cannot be sub-divided, allocate on a physical basis. Allocation based on industry benchmarks for the different product types may sometimes be feasible.	If most applicable or if physical data are unavailable.
Factory/Facility/Depot **Business Segment**	Allocate on a physical basis if products have similar inputs and processes. In some cases industry benchmarks may be useful for allocating among different products.	If most applicable or if physical data is unavailable.
Regional/National Subsidiary **Corporate level**	Unlikely to be applicable unless data covers products with similar inputs and processes. In some cases industry benchmarks may be useful for allocating among different products.	Most likely to be applicable, unless data covers products with similar inputs and processes.

Table 7.3: Allocation Methods By Scope 3 Category

Category	Likely Allocation Options
Purchased Goods & Services* – Direct Supplier Emissions	• Avoid allocation by subdividing processes based on supplier knowledge of the processes • Allocate based on physical relationships (e.g. mass, process models, industry benchmarks) • Allocate based on economic value
Purchased Goods & Services* – Cradle-to-Gate Emissions	• Avoid allocation by subdividing processes based on supplier knowledge of the processes • Allocate based on physical relationships (e.g. mass, process models, industry benchmarks) • Allocate based on economic value
Energy-Related Activities Not Included in Scope 2	• Avoid allocation by subdividing processes based on supplier knowledge of the processes that use electricity • Allocate based on physical relationships (e.g. process models, industry benchmarks) • Allocate based on economic value
Capital Equipment	• Avoid allocation by subdividing processes based on supplier knowledge of the equipment involved • Allocate based on physical relationships (e.g. knowledge of capital equipment requirements for the product) • Allocate based on economic value
Transportation & Distribution	• Avoid allocation by subdividing (i.e. identify those transport emissions attributable to the value chain of interest) • Allocate based on physical relationships (e.g. mass , volume, ton-km) • Allocate based on economic value and considering the GHG Protocol concepts of ownership and control
Business Travel	• Avoid allocation by subdividing processes (i.e. identify travel specific to the value chain of interest) • Allocate based on physical relationships (e.g. person-km)
Waste	• Avoid allocation by subdividing processes based on supplier knowledge of the processes • Allocate based on physical relationships (e.g. mass, other physical properties, industry benchmarks)
Franchises	• Avoid allocation by subdividing the franchise operation • Allocate based on physical relationships (e.g. mass, volume, number of customers, other measures of franchise activity) • Allocate based on economic value and considering the GHG Protocol concepts of ownership and control
Leased Assets	• Avoid allocation by subdividing the leasing operation • Allocate based on physical relationships (e.g. mass, volume, other measures of leasing activity) • Allocate based on economic value and considering the GHG Protocol concepts of ownership and control
Investments	• Avoid allocation by subdividing the investments based on supplier knowledge • Allocate based on economic value and considering the GHG Protocol concepts of ownership and control
Franchises	• Avoid allocation by subdividing the franchise operation • Allocate based on physical relationships (e.g. mass, volume, number of customers, other measures of franchise activity) • Allocate based on economic value and considering the GHG Protocol concepts of ownership and control
Leased Assets	• Avoid allocation by subdividing the franchise operation • Allocate based on physical relationships (e.g. mass, volume, other measures of leasing activity) • Allocate based on economic value and considering the GHG Protocol concepts of ownership and control
Transportation & Distribution	• Avoid allocation by subdividing (i.e. identify those transport emissions attributable to the value chain of interest) • Allocate based on physical relationships (e.g. mass, volume, tonne-km) • Allocate based on economic value and considering the GHG Protocol concepts of ownership and control
Use of Sold Products	• Avoid allocation by isolating the function of the company's product from those of other products used with the company's product. • Allocate based on physical relationships (e.g. mass, volume, hours used, other measures of product use) • Allocate based on economic value
Waste	• Avoid allocation by subdividing the waste-related emissions to isolate those attributable to the company's products • Allocate based on physical relationships (e.g. mass, volume, other properties that are related to emissions from waste) • Allocate based on economic value
Employee Commuting	• Avoid allocation by including only commuting of the company's own employees • Allocate based on physical relationships (e.g. person-km)

* Not otherwise included in categories 3-10

8 Accounting for GHG Reductions

9 Performance Tracking

10 Setting a Reduction Target

11 Managing Inventory Quality

Note: Chapters 8, 9, 10 and 11 will be provided in the next draft.

12 Assurance

12.1 Introduction

Performing assurance of a company's Scope 3 emissions provides confidence to users that the reported information is fairly stated. In this standard, the term assurance is used in place of the term verification, which is used in Chapter 10 of the GHG Protocol *Corporate Accounting and Reporting Standard*. The terminology has been updated to keep current with best practices and is considered a more accurate representation of this activity.

The purpose of this chapter is to:

1. Establish requirements for the type of assurance that may be performed and presented Scope 3 emissions in a company's GHG inventory in order for a company to demonstrate compliance with this standard; and
2. Provide guidance on the key aspects of obtaining such assurance, and
3. Identify material Scope 3 categories which should be included if assurance is to be provided.

Assurance on Scope 3 emissions is only to be provided in conjunction with assurance over a company's GHG inventory and should not be provided solely on Scope 3 emissions.

Assurance is when an assurance provider expresses a conclusion designed to enhance the degree of confidence of the intended users (other than the preparer of the GHG inventory report) over the measurement of the GHG inventory and the Scope 3 emissions included therein against defined criteria. The defined criteria will include all required elements of this standard and the relevant optional elements.

Assurance is an objective assessment of the accuracy, completeness and presentation of a reported GHG inventory and the Scope 3 emissions included therein and the conformity of the Scope 3 emissions to the standard[11]. Although assurance of Scope 3 emissions is still evolving, the emergence of reporting and assurance standards, such as ISO14064, Part 3; ISO14065; PAS 2050: 2008 and this standard[12], should help the reporting of Scope 3 emissions to become more consistent and credible, with assurance becoming more accessible and widely understood.

Assurance involves an assessment of the risks of material discrepancies in reported data. Such discrepancies relate to differences between reported data and data generated from the proper application of the standard. In practice, assurance involves the prioritization of effort by the assurance provider towards the higher risk areas that have the greatest impact on overall accuracy, completeness and presentation. However, an assurance provider cannot provide *absolute* assurance because there are inherent limitations that affect the assurance provider's ability to detect material discrepancies. These limitations result from factors such as the assurance provider testing less than 100% of inputs to the Scope 3 emissions, and the fact that most assurance evidence is persuasive, rather than conclusive. Rather, the assurance provider provides 'reasonable assurance' or 'limited assurance', depending on the nature and extent of the assurance provider's work.

[11] Assurance is based on an assertion by management that their report is prepared in line with applicable criteria (refer to section 1.3.4 for further information on criteria). In representing that their GHG inventory is in accordance with applicable criteria, management implicitly or explicitly make an assertion regarding the quantification, presentation and disclosure of the inventory. Assertions provide the assurance provider with a framework that can be used when identifying the risks of material misstatement and gathering engagement evidence in response to identified risks.

[12] Refer to the Appendix for more information on these standards

The categories of risks related to potential errors, omissions and misrepresentation that are considered by assurance providers are:

Inherent Risk

- Susceptibility of data to material misstatement, assuming there are no related internal controls

Control Risk

- The risk that a material misstatement could occur and not be prevented or detected on a timely basis by the entity's internal controls. This risk is a function of the effectiveness of the design and operation of internal control in achieving the entity's objectives relevant to the GHG inventory. Some control risk will always exist because of the inherent limitations of internal controls.

Detection Risk

- The risk that the assurance provider will not detect a material misstatement that exists in a GHG inventory. This risk is a function of the effectiveness of the procedures performed. It arises partly from uncertainties that exist when less than 100% of the data is examined.

The process of developing an assurable GHG inventory including Scope 3 emissions is largely the same as that for obtaining reliable and defensible data; i.e., designing and implementing adequate processes and controls to support the obtaining of reliable data and documenting the approach and methodologies used to allow appropriate interpretation of the Scope 3 emissions. Therefore, whilst this chapter should provide insight to the assurance process and where an assurance provider is likely to focus their procedures, it does not negate the need for companies to make a good faith effort to provide a complete and accurate GHG inventory including Scope 3 emissions.

Level of assurance

The level of assurance refers to the degree of confidence the intended user of the assurance conclusion can gain from the outcome of the assurance evaluation. The level of confidence that can be gained is provided in the wording of the assurance conclusion, which reflects the conclusion the assurance provider can reach based on the reduction of the assurance risk. Assurance engagement risk is the risk that the practitioner expresses an inappropriate conclusion when the subject matter information is materially misstated.

There are 2 levels of assurance:

Assurance opinion	**Limited**	**Reasonable**
Nature of opinion	Negative opinion given - moderate assurance	Positive opinion given - high assurance
Example of report wording	*"Based on our review, we are not aware of any material modifications that should be made to management's GHG report/ assertion based on the criteria set forth in the accompanying management's assertion."*	*'In our opinion management's report/ assertion is fairly stated, in all material respects, based on the criteria set forth in the accompanying management's assertion."*

The level of assurance required will dictate the amount of evidence required. An assurance provider will only ever provide confirmation to a reasonable assurance level, never absolute, as 100% of inputs to the GHG Inventory are not tested.

The objective of a limited assurance engagement is a reduction in assurance engagement risk to a level that is acceptable in the circumstances of the engagement, but where the risk is greater than for a

reasonable assurance engagement. The assurance provider expresses their opinion in a negative form – "*From what we have looked at, nothing has come to our attention*". The opinion is negative as it is restricted to the specific areas assured and doesn't state that the information is free from material misstatement but that the assurance procedures performed have highlighted no errors.

The objective of a reasonable assurance engagement is a reduction in assurance engagement risk to an acceptably low level in the circumstances of the engagement. The assurance provider expresses their opinion in a positive form – '*is free from material misstatement'*. Reasonable assurance gives a high, but not absolute, level of assurance, expressed positively in the assurance report as reasonable assurance, that the GHG Inventory is free from material misstatement.

12.2 Types of Assurance

While assurance in accordance with the Scope 3 standard is not required, companies are encouraged to seek assurance. However, if assurance is sought, material Scope 3 categories within the company's control should be included and any material categories not included should be disclosed.

Companies may follow either of the following types of assurance:

1. Internal (or "self") assurance – Persons from within the organization but independent of the GHG inventory determination process, conduct internal assurance;

2. External assurance – Persons from a certification or assurance body independent of the GHG inventory determination process, conduct independent external assurance.

Assurance providers, whether internal or external to the organization[13], should be sufficiently independent of any involvement in the determination of the GHG inventory or development of any declaration and have no conflicts of interests resulting from their position in the organization, such that they can exercise objective and impartial judgment.

The assurance opinion shall be expressed in the form of either reasonable assurance or limited assurance[14]. Refer to glossary for explanation of these terms.

When reporting a GHG inventory including Scope 3 emissions, the assurance opinion shall also be presented, including or accompanied by a clear statement identifying whether internal or external assurance has been obtained.

Where internal assurance providers are used, their relevant competencies and reasons for selecting them as assurance providers shall be disclosed in the GHG inventory report or assurance statement.

12.3 Objectives of Assurance

<u>For the company seeking assurance</u>

Before commissioning assurance, a company should clearly define its objectives and decide whether they are best met by internal or external assurance. Common reasons for undertaking assurance include:

- Increased credibility of a publicly reported GHG inventory and progress towards reduction targets, leading to enhanced stakeholder trust

[13] Although either of the above types of assurance permitted, benefits of external assurance are outlined in the guidance section.

[14] At the time of writing, reasonable assurance is not widely provided for GHG reporting (this is the case for both corporate and product GHG inventories). This is largely due to immature controls around GHG data that often results in the time requirement and hence cost of a reasonable assurance engagement being prohibitive. However, over time and as controls improve, it is expected that reasonable assurance will become more commonplace.

- Increased senior management confidence in reported information on which to base investment and target setting decisions
- Improvement of internal accounting and reporting practices (e.g., calculation, recording and internal reporting systems, and the application of GHG inventory accounting and reporting principles), and facilitating learning and knowledge transfer within the company
- Preparation for mandatory assurance requirements of GHG inventory programs which include Scope 3 emissions.

For the assurance providers

When conducting an assurance engagement over a GHG inventory the objective of the assurance provider is:

- To obtain reasonable assurance about whether the GHG inventory including scope 3 emissions, as a whole is free from material misstatement; or
- To obtain limited assurance that nothing has come to their attention that causes them to believe that the GHG inventory including scope 3 emissions, is materially misstated; and
- To report on the GHG inventory including scope 3 emissions, in the form of an assurance opinion, in accordance with their findings and the level of assurance they have been engaged to provide.

12.4 Timing of Assurance

The engagement of an assurance provider can occur at various points during the GHG inventory preparation and reporting process. Some companies may establish a semi-permanent internal assurance team to facilitate that GHG inventory data including scope 3 emissions standards are being met and improved on an on-going basis.

Assurance procedures that occur during a reporting period allows for any reporting deficiencies or data issues to be addressed before the final fieldwork is carried out. This may be particularly useful for companies preparing high profile public reports. However, companies should be aware that:

- Some procedures can only be performed when the final GHG inventory has been prepared; and
- The related assurance on the final GHG inventory including scope 3 emissions, should be completed before conformity with the standard can be confirmed.

12.5 Selecting an Assurance Provider

An assurance provider, whether internal or external, should apply the principles listed in Box 12-1.

While assurance is often undertaken by an independent, external assurance provider this need not be the case. Many companies interested in improving their GHG inventory reporting including Scope 3 emissions may subject their information to internal assurance. In this case, the personnel should at least be independent of those undertaking the GHG inventory accounting and reporting process. Both internal and external assurance should follow similar procedures and processes. For external stakeholders, external assurance is likely to significantly increase the credibility of the GHG inventory. However, internal assurance can also provide valuable assurance over the reliability of information and can be a worthwhile learning experience for a company prior to commissioning external assurance. It can also provide external assurance providers with useful information. Consequently, the use of external assurance as a final step is a decision at the discretion of the company.

A credible and competent GHG inventory assurance provider has:

- Deep assurance expertise and proven previous experience and competence in undertaking assurance engagements under recognized assurance frameworks. This includes making

objective judgments on fact based material issues, assessing the quality of data and the application of Scope 3 methodology rules;

- Robust assurance methodologies including the ability to assure data and information systems;
- Ability to assess the sources and the magnitude of potential errors, omissions and misrepresentations for further assurance activities.
- Knowledge of the company's activities, industry sector, suppliers and products and understanding of Scope 3 principles, methodologies and limitations, including (but not limited to) knowledge of life cycle assessment, scope, unit of analysis (functional unit), system boundary, allocation, and calculation methodologies including LCA software (e.g. databases and modeling software); and
- Objectivity, impartiality, credibility, independence and professional skepticism to challenge data and information.

External assurance

There are several standards, accreditation schemes and frameworks in place to assist companies in selecting a credible and competent external assurance provider. For example:

- Various accreditation schemes are currently available to GHG assurance providers world-wide, particularly for regulated schemes, for example UK-ETS, EU-ETS, CDM/JI. Typically, these accreditations are against the requirements established in ISO 14065. Accreditation to ISO 14065 indicates that the organization performing the assurance has been independently tested against specified criteria (including competence) by a recognized and authorized body (although the company engaging the assurance provider may wish to ensure that the scope accreditation covers their specific requirements).
- Professional, registered auditors in public practice are required to comply with ISAE 3000, the International Framework for Assurance Engagements, the Quality Control Standard ISQC1 and other ethical requirements. Assurance provided under these standards also gives high credibility to the assurance provider.

Companies should use their discretion to choose an assurance provider to obtain assurance over their GHG inventory and should use the most appropriate assurance provider for their circumstances. All credible assurance practitioners should follow the principles established in recognized standards, such as ISAE 3000 or ISO 14065, and be able to demonstrate this to their clients.

When choosing an assurance provider, companies should consider the knowledge and qualifications of the individual(s) conducting the assurance as well as broader experience and/or accreditation of the organization they represent. Effective assurance of often requires a mix of specialized skills, not only at a technical level (e.g., engineering expertise) but also at a business level (e.g., assurance, industrial sector and information system specialists). This includes at least one member of the assurance team having sufficient knowledge, understanding and experience of Scope 3 analysis sufficient to be able to objectively assess the suitability of the criteria.

Companies may also wish to ensure that the lead assurance provider assigned to them is appropriately qualified and experienced. The lead assurance provider should have the ability and experience to manage an engagement including planning, managing risk, assurance execution, objective judgment and drawing appropriate conclusions.

Advantages to a company of engaging an external credible and competent assurance provider include:

- Confidence that the independence, impartiality, integrity, management and competence of personnel employed by the assurance provider are scrutinized by an independent body against established standards or requirements;
- Increased credibility over reported Scope 3 emissions;
- Improved management confidence in reported information on which to base strategic, investment and reduction target decisions; and
- Enhanced stakeholder confidence when making investment and/or purchasing decisions.

Internal assurance

If using an internal assurance provider, companies should seek a suitable independent team who can demonstrate the most relevant experience for the task. The guidance above relating to external assurance providers can be a useful aid in identifying the appropriate skills. For example, employees within internal audit who have a scientific background and/or experience with corporate GHG inventories may be considered suitable or site engineers experienced with environmental site assessment audits.

Box 122-1: Principles for Assurance Providers

An assurance provider should apply the following principles.

Competency and due care
Personnel have the necessary skills, experience, supporting infrastructure and capacity to effectively complete validation or assurance activities.

Confidentiality
Confidential information obtained or created during assurance activities is safeguarded and not inappropriately disclosed.

Impartiality
Decisions are based on objective evidence obtained through the assurance process and not influenced by other interests or parties.

Integrity
Integrity is a prerequisite for all those who act in the public interest. It is essential that assurance providers act, and are seen to act, with integrity, which requires not only honesty but a broad range of related qualities such as fairness, candor, courage, intellectual honesty and confidentiality. Integrity includes assessing and, if appropriate, disclosing whether any conflicts of interest arise should an assurance provider take on a GHG inventory engagement including Scope 3 emissions.

Objectivity
Objectivity is the state of mind which has regard to all considerations relevant to the task in hand but no other. It is sometimes described as 'independence of mind'. The assurance opinion is based on evidence collected through an objective assessment of the GHG inventory engagement including Scope 3 emissions.

12.6 Establishing Assurance Parameters

The scope of assurance and the level of assurance it provides may be influenced by the company's wider goals and/or any specific jurisdictional requirements. It is possible to assure the entire GHG inventory including all Scope 3 emissions or material categories of it, although the assurance providers will need to satisfy themselves that assurance over only a part of Scope 3 emissions is meaningful to the user and includes all material categories within the company's sphere of influence. The assurance process may also examine more general managerial issues, such as quality management procedures, managerial oversight, data processes and controls, knowledge and experience of personnel, clearly defined responsibilities, segregation of duties and internal review procedures.

The company and assurance provider should reach agreement on the level of assurance required: reasonable assurance, or limited assurance.

Where an assurance provider external to the company is used, the terms of the engagement should be agreed in a contract in advance (before the commencement of the assurance procedures). This contract confirms the intended use of the assurance opinion. It is also important that the respective

responsibilities of management of the company and the assurance provider are clearly defined and understood.

The company is responsible for determining the assurance criteria, and for establishing policies and procedures to measure, record and report the GHG inventory including Scope 3 emissions in accordance with those criteria. The assurance provider's responsibility is to form an independent opinion, based on their assurance procedures, on whether the GHG inventory is fairly stated in accordance with the criteria, to the extent of the level of assurance sought. Because the assurance provider is required to be independent, they should have no involvement in setting the criteria, establishing processes in relation to, or executing any part of, the GHG inventory.

Clearly defined criteria are not only important to the company and assurance provider, but also for external stakeholders to be able to make informed and appropriate decisions. Criteria communicate the basis of preparation used to measure the GHG inventory and often expand on a general criteria to cause it to be measurable. Criteria are required as a frame of reference to achieve consistency in interpretation and understanding of the assurance opinion. It is for this reason that criteria need to be made available to all users of the assurance report.

Assurance providers will assess the suitability of the criteria and in doing so will assess whether:

- All standard requirements are included
- The system, boundaries and functional unit are clearly defined
- Assumptions and estimations made are appropriate in the circumstances
- Selection of primary and secondary data is appropriate and methodologies used are adequately disclosed (with references to external sources where applicable)
- Exclusions are reasonable in the context of the whole.

12.7 The Concept of Materiality

Information is considered to be material if, by its inclusion or exclusion, it can be seen to influence decisions or actions taken by users of it. A **material discrepancy** is an error (for example, from an oversight, omission, miscalculation or fraud) that results in a reported quantity or statement being sufficiently different from the true value or meaning to influence a user's decisions. In order to express an opinion on management's report/ assertion over the data or information, an assurance provider needs to form a view on the materiality of identified errors or uncertainties, individually and in aggregate. While the concept of materiality involves professional judgment and includes consideration of both quantitative and qualitative aspects, the point at which a discrepancy becomes material (**materiality threshold**) can usually be pre-defined - for example, exceeds 5% of the total GHG inventory being assured. However, such a threshold does not negate the principle of completeness and companies need to make a good faith effort to report a complete and accurate GHG inventory. For cases where emissions have not been estimated, or estimated at an insufficient level of quality, it is important that this is transparently documented and justified.

Consequently, assurance providers may adjust this materiality threshold during the course of their procedures if, for example, omissions are identified. Note - A materiality threshold is not the same as "de minimus" emissions, or a permissible quantity of emissions that a company can leave out of a GHG inventory.

Materiality is used by the assurance provider during the planning process and then again in evaluating the evidence obtained:

Planning: The concept of materiality is used when designing the assurance approach and sampling plans. A materiality threshold provides guidance to assurance providers on what may be an immaterial discrepancy so that they can concentrate their work on areas that are more likely to lead to materially misleading errors.

Evaluation: The concept of materiality is also used to assess whether errors and omissions identified during the course of the assurance process that, if uncorrected or omitted, would significantly misrepresent a GHG inventory to intended users, thereby inappropriately influencing their conclusions or decisions.

Understanding how assurance providers apply a materiality threshold will enable companies to more readily establish whether any errors in their inventory are likely to raise questions of materiality. Materiality thresholds may also be outlined in the requirements of a specific GHG inventory program or determined by an assurance standard, depending on who requires the assurance and for what reason.

Box 122-2: Understanding Qualitative Aspects of Materiality

An assurance provider can be expected to assess errors within the full context of what is being assured and what a user my consider material, for example:

- Where a company has a reduction target to reduce a product's GHG inventory by a set amount or percentage. Clearly, if the company's target is a 5% reduction, then the materiality threshold should be set at such a level to enable them to conclude whether or not this has been achieved; or
- Where a regulatory environment requires reduction by a certain amount. A material error would include those that may be small in isolation but would mean the difference between compliance and non-compliance.

Assessing the risk of material discrepancy

Assurance providers need to assess the risk of material discrepancy for each component of the data collection, calculation and reporting process. This assessment is used to plan and direct the assurance process.

In assessing this risk, they will consider a number of factors, including:

- Complexity and nature of the GHG inventory
- The technical knowledge and expertise of the person(s) compiling the GHG inventory
- The structure of the organization and the approach used to assign responsibility for the collection, calculation and reporting processes associated with GHG inventories
- The approach and commitment of management to the collection, calculation and reporting processes associated with GHG inventories
- Development and implementation of policies, processes, controls and procedures for collection, calculation and reporting (including documented methods explaining how data is generated and evaluated)
- Processes, controls and procedures used to check and review calculation methodologies
- Complexity and reliability of the computer information system used to process the information
- The state of calibration and maintenance of meters, and the types of meters used
- The defined system boundary for the supply chain
- The allocation methodology and assumptions made
- Reliability and availability of input data, including primary and secondary
- The nature of assumptions and estimations used
- Aggregation of data from different sources
- The extent to which reduction and/or competitive claims are made over the GHG inventory

- Other assurance processes to which the systems and data are subjected (e.g., internal audit, external reviews and certifications).

12.8 Preparing for GHG Inventory Assurance, Including Scope 3 Emissions

General preparation

Irrespective of whether the assurance provider is internal or external, assurance providers' needs are similar. The presence of a transparent, well-documented system (referred to as an audit trail) is crucial for the achievement of assurance. Sufficient and appropriate evidence needs to be available to support the GHG Inventory including Scope 3 emissions subject to assurance, i.e. the assurance provider will need to see evidence that supports the inputs to the calculation, supporting justification for assumptions made etc. The evidence should be sufficient to demonstrate consistent application of the criteria. Information required by the assurance provider may include (but not be limited to) the following:

- Information about the company, its structure, geographic location main activities and controls culture and environment
- Details of the supply chain and criteria
- Documented processes or procedures for identifying sources of GHG emissions for the Scope 3 categories emissions included in the GHG inventory within the company and along the supply chain
- Changes since any previous assurance to the system boundaries, processes, assumptions, data sources or other elements that affect the GHG inventory
- Information on other assurance processes to which the systems and data are subjected (e.g. internal audit, external reviews, assurance over part of the supply chain and/or certifications)
    - Both primary and secondary data and evidence used for calculating Scope 3 categories emissions included in the GHG inventory emissions.
- Description of how Scope 3 categories emissions included in the GHG inventory emissions data has been calculated:
    - Emission factors and other parameters used and their justification
    - Assumptions on which estimations are based
    - Information on the measurement accuracy of meters and weighbridges etc., (e.g., calibration records), and other measurement techniques
    - Documentation on what, if any, GHG inventory sources or activities are excluded due to, for example, technical or cost reasons
- Information gathering process:
    - Description of the procedures, systems and controls used in collecting, documenting, processing and collating GHG Inventory emissions data
    - Description of quality control procedures applied (e.g. internal audits, comparison with previous years' data, peer calculation or review)
- Other information:
    - List of (and access to) persons responsible for collecting GHG inventory emissions data at each site, at corporate level and suppliers
    - Information on uncertainties, qualitative and if available, quantitative.

A company, particularly where they have not yet implemented systems and controls for routinely accounting and recording GHG inventory emissions data, may wish to obtain a pre-assurance assessment from the assurance provider as to whether their processes and controls are sufficiently robust for assurance. Under these circumstances, assurance providers may make recommendations on how current measurement, data collection and collation procedures and controls can be improved to enable an assurance engagement to commence.

Companies are responsible for ensuring the existence, quality and retention of documentation so as to create an audit trail of how the GHG inventory was compiled. Companies should be mindful of this when

designing and implementing GHG inventory data processes and procedures including Scope 3 emissions.

Site / supply chain visits

Assurance providers may need to visit a number of sites/supply chain organizations to enable them to obtain sufficient, appropriate evidence in order to form a conclusion over the GHG inventory depending on the complexity of the organization, the scope of the reporting covered, and the level of assurance required from assurance. The sites / supply chain organizations visited may be selected on the basis of their proportional importance in the context of the whole GHG inventory and Scope 3 emissions categories.

The reporting company's internal Scope 3 emissions, such as employee commuting should be assured based on a sound measurable methodology such as an employee questionnaire or survey which can be subjected to assurance procedures and which reflect a representative sample. In addition to that, the company is expected to make a reasonable effort to obtain Scope 3 GHG emissions data which has been subject to assurance from both direct Tier 1 suppliers and business customers utilizing its influence or superior position in business. Information, such as employee commuting, highlights the difficulty of going beyond limited assurance to reasonable assurance when the systems used to gather the data and the data itself is subject to compromise.

To prepare for assurance, the company should include in its contracts a stipulation for site visits for assurance of Tier1 suppliers and business customers.

Assurance providers may include visits to the site of:

- Internal departments where GHG data are tracked
- Upstream Tier-1 supplier
- Downstream customer
- Others, if applicable

Value chain partners further upstream/downstream may be difficult to be assured by an assurance provider. In such cases, business to business data exchange is important and useful in order to avoid distortion of data allocation and to easily handle the data assured by another assurance provider as evidence and reference in the company's assurance process.

The selection of sites / supply chain organizations to be visited should be based on consideration of a number of factors, which may include the:

- Nature of the product/service
- Nature of the Scope 3 emissions included in the GHG inventory emission sources at each site/supply chain organization
- Complexity of the emissions data collection and calculation procedures
- Percentage contribution to total GHG inventory emissions from each site / supply chain organization
- Risk that the data from sites / supply chain organizations will be materially misstated
- Competencies and training of key personnel
- Adequacy and quality of evidence supplied remotely (e.g. electronically or by post); and
- Results of previous reviews, assurance, and uncertainty analyses.

It is in the interests of the company to retain evidence used in calculating their Scope 3 emissions, whether relating to their own operations or those of others in their supply chain, for inspection by the assurance providers. Companies should ensure they obtain and retain sufficient evidence to support the accuracy of data and reasonableness of assumptions, judgments and estimations.

Automated processes

Life cycle assessment software may be used as a secondary data source in supply chain GHG inventory calculations. Depending on inherent risk and the level of assurance sought, assurance providers may deem it appropriate to perform some procedures on the LCA software itself. Indeed, this may be the most efficient way of obtaining sufficient comfort for the level of assurance sought.

In addition to procedures over the data analysis tools within the system, an assurance provider may perform procedures over the existence and operating effectiveness of system controls such as:

- Access controls: The system should be password protected and allow users to have different levels of access depending on their role.
- Segregation of duties: In a strong control environment, the system can be used to ensure segregation of duties is maintained.
- User log and edit tracking: The system should record when data changes have been made and by whom.
- Data protection and back-up: Sufficient controls should be in place over data protection and data back-up.
- Change management: any updates (bespoke or otherwise) to the system should be tracked, tested and approved prior to introduction into the live system.
- System interfaces: if data is moving between the LCA software and other systems, controls should be in place to validate the completeness and accuracy of the transfer.

12.9 Using the Assurance Findings

Before assurance providers issue their opinion, they can be expected to share their significant findings with the company. This should include any material discrepancies they have identified, both discrepancies that are individually material and those that are material when considered in aggregate. This provides an opportunity to adjust the GHG inventory to eliminate the material discrepancies. If the assurance providers and the company cannot come to an agreement regarding adjustments, then an unqualified ("clean") assurance opinion may not be appropriate. In these circumstances a qualified opinion, expressing the nature of the material discrepancy may be issued.

As well as issuing an assurance opinion the assurance providers may, depending on the terms of their engagement, also issue a report to management containing recommendations for future improvements, e.g. where their measurement methodologies can be refined and/or their procedures and controls relating to the measurement methodologies can be improved. The process of assurance can therefore be viewed as a valuable input to the process of continual improvement in GHG emission measurement and reduction. Whether assurance is undertaken for the purposes of internal review, public reporting or to certify conformance with a particular GHG inventory program, it will likely contain useful information and guidance on how to improve and enhance a company's GHG inventory accounting and reporting system.

Similar to the process of selecting an assurance provider, those selected to be responsible for assessing and implementing responses to the assurance findings should also have the appropriate skills and understanding of GHG inventory accounting and reporting issues.

13 Reporting and Communication

Companies shall report all relevant scope 3 emissions, following the requirements in this standard, in addition to reporting all scope 1 and 2 emissions according to the *GHG Protocol Corporate Standard*.

13.1 Required information

A public GHG emissions report that is in accordance with the *GHG Protocol Scope 3 Standard* shall include the following information:

- A description of the company and inventory boundary, including an outline of the organizational boundaries chosen and the chosen consolidation approach
- The reporting period covered
- Total scope 1 emissions, total scope 2 emissions, and all required scope 3 emissions, separately reported for each scope
- Emissions data for all six GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, SF_6), separately in metric tonnes and in tonnes of CO_2 equivalent
- Scope 3 emissions reported separately for each scope 3 category included in the inventory
- Methodologies used to calculate or measure emissions
- A description of the uncertainties of reported emissions data
- A list of scope 3 activities included in the report
- A description of the screening assessment approaches used and a description of their associated uncertainties
- A list of excluded scope 3 emission sources with justification of their exclusion
- Emissions data reported separately for activities calculated using primary data and activities calculated using secondary data, extrapolated data and proxy data
- A summary of data types used to calculate the inventory (e.g., the percentages of total scope 3 emissions calculated using primary data, secondary data, and extrapolated/ proxy data)

13.2 Optional information

A public GHG emissions report should include, when applicable, the following additional information:

- Emissions data further disaggregated within scope 3 categories where this adds relevance and transparency (e.g., reporting by different categories of purchased materials or product types)
- Qualitative information about emission sources not quantified
- Additional qualitative explanations to provide context to the data
- The percentage of total anticipated scope 3 emissions that has been accounted for and reported
- Information on performance metrics and intensity ratios
- Information on the company's GHG management and reduction activities, including supplier engagement metrics, product GHG reduction initiatives, product efficiency metrics, etc.
- Information on avoided emissions from the use of sold products
- Information on purchases of GHG reduction instruments, such as emissions allowances, offsets, etc.

13.2.1 Optional information on partner engagement and performance

Because scope 3 emissions are the scope 1 and 2 emissions of a company's partners in the value chain (including suppliers, customers, service providers, etc.), reporting on a company's efforts to engage their partners in the value chain provides additional transparency on a company's scope 3 management and reduction activities.

A public GHG emissions report should include, when applicable, the following additional information:

- Partner engagement metrics, such as the number and percentage of suppliers and other partners that have:
  - Received a request from the reporting company to provide primary GHG emissions data;
  - Provided primary GHG emissions data to the reporting company;
  - Publicly reported entity-wide GHG emissions;
  - Established a publicly available entity-wide GHG reduction target;
- The percentage of value chain emissions for which suppliers and partners have provided GHG data;
- Partner GHG emissions data, both in absolute terms and allocated to the reporting company on the basis of an established metric (companies shall disclose the allocation metric and methodology used); and
- Partner performance metrics, including the GHG emissions performance of suppliers and other partners over time.

13.2.1 Optional information on product performance

A public GHG emissions report should include, when applicable, the following additional information:

- Information on the GHG emissions and energy efficiency of a company's product portfolio
- Product performance metrics and intensity ratios such as the fuel efficiency of sold vehicles, the energy efficiency of sold appliances and electronics, the GHG intensity of sold fuels, etc.
- The percentage of sold products that are compliant with energy efficiency standards, regulations, and certifications, where applicable

13.3 Uncertainty in scope 3 reporting

Uncertainty is expected to be higher for scope 3 emissions than for scope 1 and 2 emissions. Scope 3 emissions are by definition emissions from sources not under the ownership or control of the reporting entity. Data quality, degree of influence over data collection, and level of assurance are likely to be lower for scope 3 sources than for sources under the company's ownership or control. Scope 3 accounting poses additional challenges beyond scope 1 and 2 emissions including accounting for dynamic supply chains, allocating supplier emissions to customers, and broader use of secondary and modeled data. As a result, uncertainty is an inherent aspect of scope 3 reporting.

Companies shall describe the level of uncertainty of reported data to ensure transparency and avoid misinterpretation of data.

In cases where data uncertainty is high, companies should use improved methods for data collection and calculation to reduce uncertainty.

To the extent possible, companies should report emissions data in units of CO_2-e for all categories determined to be relevant, even when uncertainty of data is high. However, it is acknowledged that in some cases companies will have difficulty accessing data or may otherwise have limited confidence in emissions data. In such cases where data uncertainty is exceedingly high, companies may provide an alternative assessment of emissions for a category in place of emissions data in units of CO_2-e, such as semi-quantitative or qualitative information. Examples may include information on the relative magnitude of various scope 3 activities in relation to other scope 1, 2, and 3 sources. Companies shall not exclude

relevant emissions categories from the reported inventory on the basis of uncertainty.

Figure 13.1: Illustrative Reporting Form

GHG Emissions for Company X, Year Y	Primary[15]	Secondary[16]	Total[17]	Uncertainty[18]
Scope 1: Direct Emissions from Owned/Controlled Operations				
a. Direct Emissions from Stationary Combustion				
b. Direct Emissions from Mobile Combustion				
c. Direct Emissions from Process Sources				
d. Direct Emissions from Fugitive Sources				
Scope 2: Indirect Emissions from the Use of Purchased Electricity, Steam, Heating and Cooling				
a. Indirect Emissions from Purchased/Acquired Electricity				
b. Indirect Emissions from Purchased/Acquired Steam				
c. Indirect Emissions from Purchased/Acquired Heating				
d. Indirect Emissions from Purchased/Acquired Cooling				
Scope 3				
a. Indirect Emissions from Purchased Products (Upstream)				
1. Purchased Goods & Services (Cradle-to-Gate Emissions) (Not Otherwise Included in Categories 2-10)				
2. Energy-Related Emissions (Not Included in Scope 2)[19]				
3. Capital Equipment[20]				
4. Transportation & Distribution				
5. Waste Generated in Operations[21]				
6. Business Travel				
7. Franchises (Not Included in Scope 1 or 2) – Reported by Franchisee				
8. Leased Assets (Not Included in Scope 1 or 2) – Reported by Lessee				
9. Investments (Not Included in Scope 1 or 2)				
10. Other				
b. Indirect Emissions from Sold Products (Downstream)				
1. Franchises (Not Included in Scope 1 or 2 – Reported by Franchisor)				
2. Leased Assets (Not Included in Scope 1 or 2 – Reported by Lessor)				
3. Distribution of Sold Products[22]				
4. Use of Sold Products				
5. Disposal of Sold Products at the End of Life				
6. Other				
c. Other Indirect Emissions				
1. Employee Commuting				
2. Other				
Direct (Tier 1) Supplier Emissions		*N/A*		
% of Suppliers Accounted For (As a % of Total Spend)				
CO_2 from Biomass Combustion				

[15] Based on primary (company-specific) data
[16] Including secondary (industry-average) data, extrapolated data and proxy data
[17] Sum of measured and modeled data
[18] Description of the uncertainty of reported data, either in qualitative or quantitative terms
[19] Includes T&D losses; extraction and production of fuels used in generation; and purchased power not consumed
[20] Manufacturing/construction of capital equipment
[21] Disposal/treatment of waste generated in operations
[22] Including transportation, storage, retail, etc. subsequent to sale to another entity

Part 2: Guidance for Specific Scope 3 Categories

Part 2 of this standard provides specific guidance for each scope 3 category, including:

- A description of each category and a list of activities included in each category
- Guidance for determining which emissions to report
- Guidance on how to calculate emissions
- Case studies and examples

Upstream Emissions

Upstream emissions are the emissions that occur in the life cycle of inputs (i.e., purchased or acquired goods, services, materials, and fuels), up through receipt by the reporting company. These include the scope 1, 2 and 3 emissions of a company's suppliers.

Upstream emissions are categorized into the following categories:

1. Purchased goods and services – Direct (Tier 1) supplier emissions
2. Purchased goods and services – Cradle-to-gate emissions
3. Energy-related activities not included in scope 2
4. Capital equipment
5. Transportation & distribution (upstream)
6. Business travel
7. Waste generated in operations
8. Franchises not included in scope 1 and 2 (upstream)
9. Leased assets not included in scope 1 and 2 (upstream)
10. Investments not included in scope 1 and 2

Categories 3 through 9 represent emissions from specific categories of purchased products, while Categories 1 and 2 include emissions from all other purchased materials and services.

1. Purchased Goods and Services – Direct (Tier 1) Supplier Emissions

1.1 Description

Direct (tier 1) suppliers are companies with which the reporting company has a purchase order for raw materials, components, goods, services, or manufacturing related to the production of product or services sold by the reporting company.

Emissions from this category are limited to the scope 1 and 2 emissions of a reporting company's direct (tier 1) suppliers. Emissions from this category reflect the operational performance of a reporting company's suppliers, rather than the full cradle-to-gate emissions of the materials and services the reporting company purchases, which are accounted for in category 2 below.

This category includes outsourced activities including:

- Contract manufacturing
- Data centers
- Other outsourced services

1.2 Determining Relevant Emissions

Companies should seek to obtain GHG emissions data from all direct suppliers. However, it is acknowledged that many small suppliers will compromise only a small share of a company's total emissions related to its direct suppliers.

Companies should prioritize suppliers based on either their expected contribution to total emissions or to a company's total spend.

Note: The screening methods for Category 1 (Purchased Goods and Services - Direct Supplier Emissions) and Category 2 (Purchased Goods and Services – Cradle to Gate Emissions) are the same and should result in the selection of the same set of purchased goods and services and their suppliers for inclusion in the inventory. For this set of purchased goods and services, Category 1 includes the scope 1 and scope 2 emissions of the direct suppliers of those products, while Category 2 includes the cradle-to-gate emissions of those purchased products.

1.2.1 Emissions-based screening assessment

Under this approach, companies should account for the emissions of those direct suppliers that contribute most to GHG emissions, e.g. by supplying the reporting company with materials and services that are relatively GHG-intense.

To identify relevant suppliers, companies should follow one or more of the following approaches:

- Include suppliers of the highest emitting materials based on the following calculations:
  - Total quantity of materials purchased (tonne) x average emission factor per material (kg CO_2-e/tonne) using secondary process LCA data by material type
  - Total expenditure by material type (dollars) x average emission factor per material type (kg CO_2-e/dollar) using input-output databases
- Include suppliers of all materials that are included in an industry checklist of high-emitting materials
- Include suppliers from sectors that are included in an industry checklist of high-emitting sectors based on input-output databases.

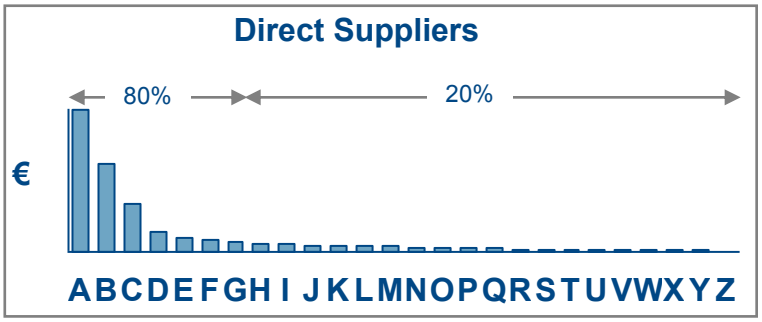
1.2.2 Financial-based screening assessment

Under this approach, companies should account for the emissions of those direct suppliers that represent the majority of the reporting company's total spend.

To identify relevant suppliers, companies should rank their direct suppliers according to their contribution to the reporting company's total spend (i.e., expenditure on each supplier as a percentage of total expenditures).

Companies should include all direct suppliers that collectively account for 80% of the reporting company's total spend, as well as any supplier in the remaining 20% that is individually more than 1% of total spend.

Figure XX. Ranking a Company's Direct Suppliers According to Spend



Note: A-Z represent individual suppliers. In this example, suppliers A through G collectively account for 80% of the company's spend.

Companies shall disclose the percentage of emissions from direct suppliers accounted for, calculated as a fraction of total spend (e.g., the company reports emissions from the largest direct suppliers that collectively account for 80% of the reporting company's total spend).

1.3 Calculating Emissions

Companies should obtain product-level emissions data from its suppliers following the GHG Protocol *Product Life Cycle Standard* where possible. Otherwise, companies should allocate its suppliers' emissions to its purchased product s based on mass, volume, units of production, revenue, etc. (see Chapter 7 for more information).

To allocate supplier emissions to a customer on the basis of revenue, multiply the supplier's emissions by the percentage of the reporting company's dollar volume to the suppliers' total revenue.

Example 1.1: Allocating on the Basis of Revenue

Supplier X emits 1,000 tonnes CO_2e and has revenue of $5 billion. The reporting company purchases $1 billion worth of goods from Supplier X. The reporting company's scope 3 emissions associated with Supplier X = 1,000 tonnes CO_2e x 1/5 = 200 tonnes CO_2e.

1.4 Case Studies

Box 1.1: Outsourced Activities

Outsourced activities may include contract manufacturing, data centers, logistics, overhead/administrative functions such as human resources and finance/accounting, etc.

Contract Manufacturing

Contract manufacturing is a type of outsourcing with a significant GHG impact. Many companies have become "brand stewards" that own and market a product using their well known brand, but outsource manufacturing to other companies rather than manufacture the product themselves. Since contract manufacturing is expected to be large source of emissions, contract manufacturing should be accounted for in a company's scope 3 inventory.

Accounting Issues: Tracking Emissions over Time

Following the GHG Protocol *Corporate Standard*, companies shall recalculate base year emissions when structural changes in the reporting organization have a significant impact on the company's base year emissions. A structural change involves the transfer of ownership or control of emissions-generating activities or operations from one company to another. Structural changes include outsourcing and insourcing of emitting activities.

Outsourcing/insourcing that shifts significant emissions between scope 1 and scope 3 when scope 3 is *not* reported triggers a base year emissions recalculation. However, structural changes due to outsourcing or insourcing do not trigger base year emissions recalculation if the company is reporting its scope 3 emissions from outsourced or insourced activities.

In case a company decides to track emissions over time separately for different scopes, and has separate base years for each scope, base year emissions recalculation for outsourcing or insourcing is made.

Example:

In Year 1, an auto parts company operates a manufacturing plant with significant GHG emissions. In Year 2 the company shut s down the plant and outsources the manufacturing to three different companies around the world – Companies B, C and D.

Because Company A outsources its manufacturing to Company's B, C and D, Company A's scope 1 and 2 emissions decrease from Year 1 to Year 2. Company A's scope 3 emissions from contract manufacturing increase from Year 1 to Year 2.

Company A's total scope 1 + scope 2 + scope 3 emissions (including the emissions from contract manufacturing) may increase or decrease from Year 1 to Year 2, depending on whether Company B's, C's and D's operations are more or less GHG-intense than Company A's operations (e.g. depending on the type, age, and efficiency of the companies' manufacturing equipment).

Year 1 is Company A's base year. Since Company A reports emissions from outsourced activities in both Year 1 and Year 2, Company A does not recalculate its base year emissions.

IT and Data Centers

Data centers are a significant source of GHG emissions, since data centers consume significant amounts of electricity. Microsoft has estimated that in 2006, U.S. data centers alone consumed 61 billion kWh, or about 1.5% of the total electricity consumed in the U.S. that year. On a daily basis, McKinsey estimated that in 2006 the average data center facility consumed the same amount of energy as 25,000 households. On a worldwide basis, computer servers were estimated to account for 0.5% of all electricity consumption.

Substantial electricity is consumed in both operating and cooling computer servers. Several factors affect electricity consumption and GHG emissions, including data center architecture and layout, load balancing, number of data center locations used, and geographic location.

Accounting Issues: Calculating Emissions from Shared Facilities

Most outsourced data centers are shared facilities. The customer outsourcing its data center activities may not have visibility into the data centers' electricity charges. Sometimes, the customer is separately charged for electrical usage on a pass through basis. Often, though, it is included in the service charge, and two customers can have the same electricity consumption and pay materially different charges because of the complexity of the service provided. The actual costs are made more opaque by the fact that outsourcing providers usually smooth the monthly charges over the term of the agreement, so what is paid in year one is the same as what is paid in year 5. Unless the customer focuses on energy consumption in its negotiations, reductions in electricity consumption (and attendant GHG emissions) are unlikely to be reflected in the price it pays for the service.

Additionally, the architecture of data center services is moving toward "cloud computing" -- where the data is processed on servers located around the world, and it is not clear whose data is being processed on what server at any given time; rather, the data load of all of the servers is balanced and allocated across the cloud to keep any one set of servers from reaching capacity.

Using financial based accounting in outsourcing as a proxy for electricity consumption/GHG emission is likely to distort the actual emission picture. If a data center operator were to disclose its total electricity consumption for a facility, and the customer knew what percentage of total servers it accounted for, it could estimate the portion of electrical consumption its outsourced activities were responsible for. However, because (i) load balancing, rack configuration, and cloud computing have a material effect on consumption/emission and (ii) data center electricity consumption is such a significant emission source, multiplying the percentage of servers at the facility by total electrical consumption is likely to produce an unreliable proxy for actual emissions from the outsourced activity.

Other Outsourced Activities

Other business processes that may be outsourced include finance and accounting, human resources, corporate real estate, etc. These outsourced activities are generally less GHG-intensive than contract manufacturing and data centers, but may shift employee commuting and business travel patterns. Emissions from these outsourced activities should be accounted for where significant.

2. Purchased Goods and Services – Cradle-to-Gate Emissions

2.1 Description

Emissions from purchased goods and services are the GHG emissions associated with extracting and producing materials and services that serve as inputs to a company's operations, including purchased or acquired goods, services, materials and fuels. This category includes the cradle-to-gate emissions of purchased materials prior to acquisition by the reporting company. Purchased products include both goods (e.g., raw materials) and services.

This category includes all purchased goods and services not otherwise included in the other categories of upstream scope 3 emissions. Specific categories of upstream emissions (e.g., capital equipment, business travel, transportation and distribution, etc.) are separately accounted and reported to enhance the transparency and consistency of reported scope 3 inventories. This general category of purchased goods and services includes all other raw materials, goods and services used as inputs to the company's operations.

A reporting company's scope 3 emissions from purchased materials are the scope 1, 2 and 3 emissions of its suppliers, including both its direct suppliers (tier 1) and its suppliers' suppliers (tiers 2-X).[23]

2.2 Determining relevant emissions

Emissions from purchased materials and services are expected to be a relevant scope 3 category for many companies, since emissions from the production of purchased materials are likely to be large compared to other scope 3 activities. Within the category, companies shall identify which categories of purchased materials and services are most relevant for the company and should be reported.

Companies shall report all relevant cradle-to-gate emissions from purchased materials and services, taking into account not only the emissions of a company's direct suppliers (tier 1), but also the emissions of a company's suppliers' suppliers (tier 2) and beyond (tier 3 - N), where relevant.

[23] Including suppliers of imported electricity, heat, steam and cooling.

Relevant upstream emissions include all emissions in the supply chain where a screening assessment has determined them to be significant in size.[24] Companies should conduct a screening assessment to prioritize categories of purchased materials based on size.

To determine which emissions from purchased goods and services are most significant in size, companies should follow these steps:

1. Use screening methods to individually estimate the emissions from all categories of purchased goods and services.
2. Express the estimated emissions from each category of purchased good or service as a fraction of total anticipated scope 3 emissions.
3. Rank all categories of purchased goods and services from largest to smallest to determine which activities are most significant.

Companies shall account for and report emissions from the largest categories of purchased goods and services such that the reporting company accounts for at least 80% of total anticipated scope 3 emissions.[25]

Companies may use either:

- An emissions-based screening assessment, using emission factors from databases such as secondary (industry-average) life cycle inventory databases or environmentally-extended input-output models, or
- A financial-based screening assessment, using purchase spend.

Companies should give preference to an emissions-based screening assessment over a financial-based screening assessment, since an emissions-based approach more closely approximates actual emissions. While a financial-based approach prioritizes categories of purchased products based on financial activity data alone, an emissions-based approach combines activity data (either financial data such as purchase spend or physical data such as tonnes of materials consumed) with emission factors representing the GHG intensity of different categories of purchased products.

Through the screening assessment, a company should rank each category of purchased materials according to its contribution to either total anticipated emissions or total spend (see Figure XX).

Companies shall disclose:

- The percent of total anticipated emissions from purchased products chosen for inclusion in the boundary;
- The screening assessment approach that was followed; and
- The uncertainties associated with the screening assessment used.

Note: The screening methods for Category 1 (Purchased Goods and Services - Direct Supplier Emissions) and Category 2 (Purchased Goods and Services – Cradle to Gate Emissions) are the same and should result in the selection of the same set of purchased goods and services and their suppliers for inclusion in the inventory. For this set of purchased goods and services, Category 1 includes the scope 1 and scope 2 emissions of the direct suppliers of those products, while Category 2 includes the cradle-to-gate emissions of those purchased products.

[24] Relevant upstream emissions should also include other emissions that meet additional relevance criteria outlined in section 5.3.

[25] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

2.2.1 Emissions-based screening assessment

Under this approach, companies should account for the emissions of those purchased goods and services that contribute most to GHG emissions. Companies should take into account both the relative quantity purchased as a share of total expenditures (i.e., account for purchased products that represent a large share of total spend) as well as the relative GHG intensity of various categories of purchased products (i.e., account for purchased products that are the most GHG intense).

To identify relevant categories of purchased goods and services, companies should follow one or more of the following approaches:

- Include the highest emitting purchased goods and services based on the following calculations:
  - Total quantity of materials purchased (tonne) x average emission factor per material (kg CO_2-e/tonne) using secondary process LCA data by material type
  - Total expenditure by material type (dollars) x average emission factor per material type (kg CO_2-e/dollar) using input-output databases
- Include all materials that are included in an industry checklist of high-emitting materials
- Include all materials from sectors that are included in an industry checklist of high-emitting sectors based on input-output databases.

2.2.2 Financial-based screening assessment

Under this approach, companies should account for the emissions of those categories of purchased goods and services that represent the majority of the reporting company's total spend.

To identify relevant purchased goods and services, companies should rank their categories of purchased goods and services in the reporting year according to their contribution to the reporting company's total spend (i.e., expenditure on each category as a percentage of total expenditures). See Figure XX.

Companies should include all purchased goods and services that collectively account for at least 80% of the reporting company's total spend, as well as any category in the remaining 20% that is individually more than 1% of total spend. Companies should also account for any additional categories that are expected to contribute significantly to emissions, such as small areas of spend that have relatively high emissions.

Companies shall disclose the percentage of emissions from purchased goods and services accounted for, calculated as a fraction of total spend (e.g., the company reports emissions from the largest categories of purchased goods and services that collectively account for 80% of the reporting company's total spend).

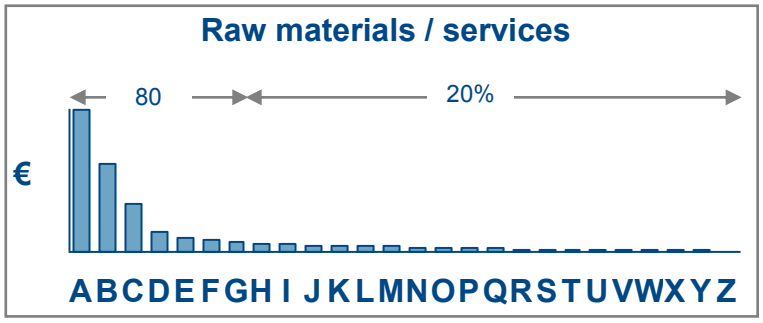
Box 2.1: Alternate Boundary Requirements if Using a Financial-Based Screening Assessment

Using a financial-based screening method does not allow a company to estimate total anticipated emissions from purchased goods and services. Therefore, the requirement to account for and report at least 80% of total anticipated scope 3 emissions is not compatible with the use of financial-based screening methods.

If a company uses a financial-based screening method for Category 2 (Purchased Goods and Services – Cradle to Gate Emissions), then the company shall account for and report:

- For Category 2 (Purchased Goods and Services – Cradle to Gate Emissions); Emissions from the largest 80% of categories of purchased goods and services based on spend;
- For Categories 3-13, 15, and 16: At least 80% of total anticipated emissions from the sum of Categories 3-13, 15, and 16;
- For Category 14 (Use of Sold Products): The use phase emissions of: all sold products that consume energy (fossil fuels or electricity) in the use phase; all sold fuels; and all sold products that contain and emit GHGs in the use phase (see Part 2, Section 14 for more information); and
- All scope 1 and scope 2 emissions, as required by the GHG Protocol *Corporate Standard*.

Figure 2.1. Ranking a Company's Purchased Product Categories According to Spend



Note: A-Z represent individual categories of purchased products. In this example, categories A through G collectively account for 80% of the company's spend.

2.3 Calculating emissions

Once the relevant categories of purchased products have been identified, the next step is to collect GHG data for each product category. Companies should collect data according to the following order of preference:

- Primary data from a company's direct suppliers
- Secondary data (industry-average) data from published sources, such as life cycle inventory or input-output databases
- Other types of estimated data

Companies should give preference to primary data collection to enable performance tracking of company- and product-specific improvements and to engage suppliers to expand GHG management throughout the supply chain. Companies may use secondary and estimated data when primary data is not available or not representative.

For each category of purchased product, companies should determine whether primary data or secondary data is expected to yield a more representative estimate of cradle-to-gate GHG impact. To do so, companies should divide purchased materials into two categories:

1. **Purchased materials where the most significant cradle-to-gate emissions are the scope 1 and 2 emissions of the reporting company's tier 1 supplier.** For these materials, companies should obtain primary (company-specific) data from its tier 1 suppliers, including scope 1, scope 2, and if available, scope 3 emissions.[26]

[26] Companies should obtain product-level emissions data from its suppliers following the GHG Protocol Product Life Cycle Standard if possible. Otherwise, companies should allocate its suppliers' emissions to its purchased product s based on mass, volume, revenue, etc.

2. **Purchased materials where the most significant cradle-to-gate emissions occur further upstream than the reporting company's tier 1 supplier (i.e., the scope 1 and 2 emissions of the reporting company's tier 2-N suppliers).** For these materials, companies may collect primary data from their tier 2-N suppliers or estimate emissions using secondary (industry average) emission factors (e.g., life cycle inventory data). Companies should estimate the full upstream (cradle to gate) emissions of the purchased products.

Emissions calculated using primary data shall be reported separately from emissions calculated using secondary and estimated data.

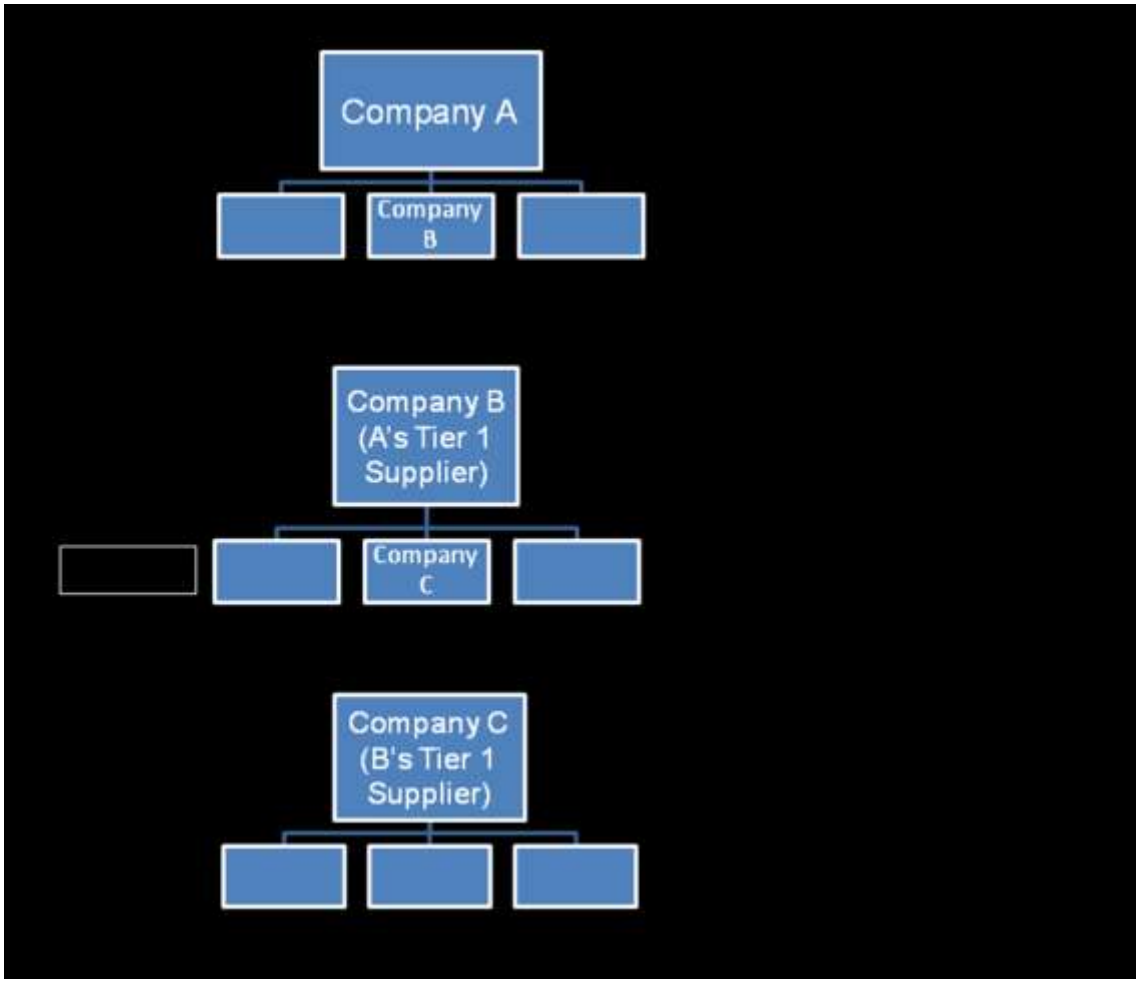
Companies shall disclose the calculation methodologies and assumptions used to estimate emissions.

Figure 2.2: Choosing data types for various categories of purchased products

	Spend Category	A	B	C	D	E	F
preference	Primary Data	X	X	X			
	Secondary Data			X	X	X	
	Estimated Data					X	X

2.3.1 Calculating emissions from purchased products using supplier-specific (primary) data

Figure 2.3: Propagation of primary data collection throughout a supply chain



Note: Companies should obtain product-level emissions data from its suppliers following the GHG Protocol *Product Life Cycle Standard* where possible. Otherwise, companies should allocate its suppliers' emissions to its purchased product s based on mass, volume, revenue, etc. (see Chapter 7).

2.3.2 Calculating emissions from purchased products using secondary data

2.4 Case studies and examples

3. Energy-Related Emissions Not Included in Scope 2

1.1 Description

This category includes:

3.1. Extraction, production, and transportation of fuels consumed in the generation of electricity, steam, heating and cooling (either purchased or own generated by the reporting company)

- Note: This category is applicable to end users of electricity. Refer to Section 1.2 below to determine if relevant and should be reported.

3.2. Generation of electricity, steam, heating, and cooling that is consumed in a T&D system (reported by end user)
- Note: This category is applicable to end users of electricity. Refer to Section 1.2 below to determine if relevant and should be reported.

3.3. Purchase of electricity, steam, heating, and cooling that is sold to an end user (reported by utility company or energy retailer).
- Note: *This category is only applicable to utility companies and energy retailers that purchase energy for resale.* Refer to Section 1.2 below to determine if relevant and should be reported.

1.2 Determining relevant emissions

To determine which scope 3 activities are most significant in size, companies should follow these steps:

1. Use screening methods to individually estimate the emissions from all scope 3 activities.
2. Express each individual scope 3 activity's estimated emissions as a fraction of total anticipated scope 3 emissions.
3. Rank all scope 3 activities from largest to smallest to determine which activities are most significant.

Companies may use either:

- An emissions-based screening assessment, or
- A financial-based screening assessment.

Companies should give preference to an emissions-based screening assessment over a financial-based screening assessment, since an emissions-based approach more closely approximates actual emissions.

Companies shall account for and report the largest scope 3 sources that collectively account for at least 80% of total anticipated scope 3 emissions.[27]

3.2.1. Emissions-based screening assessments

3.1.Extraction, production, and transportation of fuels consumed in the generation of electricity, steam, heating and cooling (either purchased or own generated by the reporting company)	• Electricity: Total electricity purchase (MWh) x average national or regional Scope 3 emission factor (t CO2-e/MWh) if known, otherwise use default value of [X%] (to be provided) • Steam: Total steam purchase (GJ) x average national or regional Scope 3 emission factor (t CO2-e/GJ) if known, otherwise use default value of [X%] (to be provided) • Cooling: Total cooling purchase (GJ) x average national or regional Scope 3 emission factor (t CO2-e/GJ) if known, otherwise use default value of [X%] (to be provided) *Note: The "Scope 3 emission factor" is an emission factor representing total life cycle emissions of each energy*

[27] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

	type excluding the combustion phase (i.e., life cycle emissions of each energy type upstream of combustion). Emissions from combustion are counted in the grid average emission factor used to calculate scope 2 emissions.
3.2. Generation of electricity, steam, heating, and cooling that is consumed in a T&D system (reported by end user)	• For each country of operation: Total scope 2 emissions by energy type × national average T&D loss factor (%) by energy type if known, otherwise use default value of [X%] (to be provided)
3.3 Purchase of electricity, steam, heating, and cooling that is sold to an end user (reported by utility company or energy retailer)	• Conservative method: Total purchased electricity, steam, heating or cooling for resale to end-users (in MWh) * emission factor (kg CO_2-e/MWh) of the highest emitting source purchased • Average method: Total purchased electricity, steam, heating or cooling for resale to end-users (in MWh) * mass-weighted grid or national average emission factor (kg CO_2-e/MWh) of all emitting sources purchased

3.2.2 Financial-based screening assessments

3.1 Extraction, production, and transportation of fuels consumed in the generation of electricity, steam, heating and cooling (either purchased or own generated by the reporting company)	• N/A
3.2 Generation of electricity, steam, heating, and cooling that is consumed in a T&D system (reported by end user)	• N/A
3.3 Purchase of electricity, steam, heating, and cooling that is sold to an end user (reported by utility company or energy retailer)	• Revenues from energy purchased for resale to end-users as a share of your organization's total revenues (%)

3.2.3 Other Criteria for Determining Relevant Emissions

In addition to accounting for all activities that collectively account for 80% of total anticipated scope 3 emissions in terms of size,[28] companies should consider other criteria to determine whether additional scope 3 activities should be accounted for and reported.

Scope 3 activities should be considered relevant if they meet any of the following criteria:

1. There are potential emissions reductions that could be undertaken or influenced by the company
2. They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and technology, compliance/litigation, reputational and physical risks)
3. They are deemed critical by key stakeholders (e.g., feedback from customers, suppliers, investors or civil society)
4. They are an outsourced activity that is typically insourced by other companies in the reporting company's sector

[28] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

5. They meet additional criteria developed by the company or industry sector

1.3 Calculating emissions

1.4 Case studies and examples

4. Capital Equipment

4.1 Description

Capital equipment refers to equipment that a company uses to manufacture a product, provide a service or sell, store and deliver merchandise. This equipment has an extended life so that it is properly regarded as a fixed asset.

This category includes the cradle-to-gate emissions associated with manufacturing or constructing the capital equipment owned or controlled by the reporting company.

A reporting company's scope 3 emissions from capital equipment are the scope 1, 2 and 3 emissions of its suppliers of capital equipment.

4.2 Determining relevant emissions

To determine which scope 3 activities are most significant in size, companies should follow these steps:

1. Use screening methods to individually estimate the emissions from all scope 3 activities.
2. Express each individual scope 3 activity's estimated emissions as a fraction of total anticipated scope 3 emissions.
3. Rank all scope 3 activities from largest to smallest to determine which activities are most significant.

Companies may use either:

- An emissions-based screening assessment, or
- A financial-based screening assessment.

Companies should give preference to an emissions-based screening assessment over a financial-based screening assessment, since an emissions-based approach more closely approximates actual emissions.

Companies shall account for and report the largest scope 3 sources that collectively account for at least 80% of total anticipated scope 3 emissions.[29]

4.2.1. Emissions-based screening assessments

- Units of equipment x industry average life cycle emission factor per unit of equipment (t CO_2-e) using secondary process LCA data
- Quantity of primary material within equipment (tonne) x industry average emission factor by material type (kg CO_2-e /tonne) using secondary process LCA data
- Total expenditure by equipment type (dollars) x average emission factor per equipment type (kg CO_2-e/dollar) using input-output databases
- Refer to an industry checklist based on input-output databases to determine if capital equipment is expected to be a high priority category (to be provided)

[29] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

4.2.2 Financial-based screening assessments

- Expenditure on capital equipment as a share of total expenditures (%)
- Capital equipment as a share of your organization's total financial capital (%)

4.2.3 Other Criteria for Determining Relevant Emissions

In addition to accounting for all activities that collectively account for 80% of total anticipated scope 3 emissions in terms of size,[30] companies should consider other criteria to determine whether additional scope 3 activities should be accounted for and reported.

Scope 3 activities should be considered relevant if they meet any of the following criteria:

1. There are potential emissions reductions that could be undertaken or influenced by the company
2. They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and technology, compliance/litigation, reputational and physical risks)
3. They are deemed critical by key stakeholders (e.g., feedback from customers, suppliers, investors or civil society)
4. They are an outsourced activity that is typically insourced by other companies in the reporting company's sector
5. They meet additional criteria developed by the company or industry sector

4.3 Calculating emissions

4.4 Case studies and examples

5. Transportation & Distribution (Upstream / Inbound)

5.1 Description

This category includes the emissions from:

5.1 External[31] transportation & distribution of inputs (i.e., purchased or acquired goods, services, materials or fuels), including intermediate (inter-facility) transport & distribution, associated with direct suppliers (transport/logistics providers);

5.2 External warehousing & storage of inputs (i.e., purchased or acquired goods, services, materials or fuels), associated with direct suppliers (transport/logistics providers); and

5.3 External transportation of waste generated in operations

A reporting company's scope 3 emissions from transportation and distribution are the scope 1 and 2 emissions of its logistics providers, dependent on ownership of warehouse and transportation contracts.

5.2 Determining relevant emissions

To determine which scope 3 activities are most significant in size, companies should follow these steps:

[30] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

[31] i.e., in vehicles and facilities not owned or controlled by the reporting company.

1. Use screening methods to individually estimate the emissions from all scope 3 activities.
2. Express each individual scope 3 activity's estimated emissions as a fraction of total anticipated scope 3 emissions.
3. Rank all scope 3 activities from largest to smallest to determine which activities are most significant.

Companies may use either:

- An emissions-based screening assessment, or
- A financial-based screening assessment.

Companies should give preference to an emissions-based screening assessment over a financial-based screening assessment, since an emissions-based approach more closely approximates actual emissions.

Companies shall account for and report the largest scope 3 sources that collectively account for at least 80% of total anticipated scope 3 emissions.[32]

5.2.1. Emissions-based screening assessments

5.1 External transportation & distribution of inputs (i.e., purchased or acquired goods, services, materials or fuels), including intermediate (inter-facility) transport & distribution, associated with direct suppliers	• For each transportation mode (i.e., air, rail, truck, barge): Estimated total distance travelled (km) x total quantity transported (tonnes) x industry average emission factor (kg CO_2-e/tonne-km)
5.2 External warehousing & storage of inputs (i.e., purchased or acquired goods, services, materials or fuels), associated with direct suppliers	• Number of third party warehouses used to store products inbound to your company x conservative estimated storage space per warehouse (m^3) x industry average emission factor (kg CO_2-e/m^3)
5.3 External transportation of waste generated in operations	• Waste generated (tonnes) x conservative estimated distance to landfill (km) x average emission factor (kg CO_2-e/tonne-km for trucks)

5.2.2 Financial-based screening assessments

[32] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

5.1 External transportation & distribution of inputs (i.e., purchased or acquired goods, services, materials or fuels), including intermediate (inter-facility) transport & distribution, associated with direct suppliers	• Expenditure on external transportation and logistics as a share of total expenditures (%)
5.2 External warehousing & storage of inputs (i.e., purchased or acquired goods, services, materials or fuels), associated with direct suppliers	• Expenditure on external warehousing and storage as a share of total expenditures (%)
5.3 External transportation of waste generated in operations	• Expenditure on transportation of waste as a share of total expenditures (%)

5.2.3 Other Criteria for Determining Relevant Emissions

In addition to accounting for all activities that collectively account for 80% of total anticipated scope 3 emissions in terms of size,[33] companies should consider other criteria to determine whether additional scope 3 activities should be accounted for and reported.

Scope 3 activities should be considered relevant if they meet any of the following criteria:

1. There are potential emissions reductions that could be undertaken or influenced by the company
2. They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and technology, compliance/litigation, reputational and physical risks)
3. They are deemed critical by key stakeholders (e.g., feedback from customers, suppliers, investors or civil society)
4. They are an outsourced activity that is typically insourced by other companies in the reporting company's sector
5. They meet additional criteria developed by the company or industry sector

5.3 Calculating emissions

This guidance is intended to facilitate corporate-level measurement and reporting of greenhouse gases (GHG) emissions from freight transportation and distribution. The section addresses Scope 3 emissions from the use of transportation sources that are owned or controlled by other entities. The following categories of sources are covered:

- Road transport
- Rail transport

[33] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

- Air transport
- Water transport
- Terminal handling
- Storage (warehousing)

This is a cross-sectoral guideline which shall be used by all industry and service sectors whose operations involve freight transportation and/or distribution.

5.3.1 Calculation methodology

Once the transportation and distribution supply chain has been mapped companies have to define the appropriate calculation methodology for the freight transportation activities.

1. Fuel-based methodology: fuel consumption is multiplied by the CO_2 emission factor for each fuel type

$$CO_2 \text{ Emissions} = \text{Fuel Used} \times \text{Heating Value} \times \text{Emission factor}$$

2. Distance-based methodology to calculate CO_2 emissions: emissions can be calculated by using distanced based emission factors (e.g. g/km) to calculate emissions

$$CO_2 \text{ Emissions} = \text{Distance Travelled} \times \text{Emission factor}$$

3. Activity-based methodology to calculate CO_2 emissions: emissions can be calculated by using cargo transport activity based emission factors (e.g. g/t-km) to calculate emissions

$$CO_2 \text{ Emissions} = \text{Quantity} \times \text{Distance Travelled} \times \text{Emission factor}$$

For those activities that do not depend on the distance travelled (storage, terminal operations) the fuel-based methodology can be substituted by a methodology based on specific emission factors for these activities.

5.3.1.1 Fuel-based methodology

The fuel-based methodology has a higher degree of accuracy than the distance-based methodology. When using this methodology companies shall need from their providers not only data related to the total consumption in that leg by the vehicle but also about how much of that consumption corresponds to the freight that belongs to the company and what allocation key has been used to calculate that.

5.3.1.2 Distance-based and activity-based methodology

Emissions from the distance-based methodology can be collected from each specific carrier or mode operator, from carrier associations or from LCA databases. The factor used conditions the accuracy of the final result. Factors can be classified in:

- Primary – high accuracy: specific emissions from a particular shipment provided by the carrier. In that case the carrier does not provide a factor but the total emissions associated to that shipment.
- Primary – medium accuracy: emission factors per trade-line provided by the carrier. These are based on network configuration (vehicle mix) and historical emission factors per type of vehicle.
- Primary – low accuracy: global average emission factor provided by the carrier or an association of carriers
- Secondary: LCA databases or general average emission factors

A description of emission factors is provided in Table A

5.3.2 Mapping

For transportation activities the first step to estimate the scope 3 emissions is to map the supply chain in terms of:

- Modes of transportation and vehicles utilized for each mode
- Quantities for each shipment
- Distances for each shipment
- Vehicle utilizations if necessary
- Inter-modal changes (e.g. sea terminal)
- Storage points (including days of storage)
- Refrigerated activities

5.3.2.1 Quantities for each shipment

Companies should convert the quantities for each transportation leg should into the unit that drives fuel consumption in that specific transportation mode (e.g. containers for containerships tonnes for road and air freight etc.). Assumptions for the conversion factors should be noted down in case the standard conversion factors (see Table A) are not used.

5.3.2.2 Distances for each shipment

When using the distance-based methodology companies should use actual distances to be provided by transportation suppliers. In case these are not available companies should use available software to calculate direct distances for each leg of the transportation supply chain.

For airfreight transportation 200km should be added to the direct distance to account for the extra distance related to landing and take-off operations.

5.3.2.3 Utilizations

The amount of backhaul emissions that should be associated to the main hauls depends of several factors that companies should consider when estimating their scope 3 transportation and distribution calculations.

The utilization used in the calculations shall consider (in that order and when available)

- Exact utilization for the specific shipment in the backhaul; or
- Average utilization in that route's backhaul
- Average utilization for the backhauls in that transportation leg (industry average)

Note that many emission factors provided by transportation associations and LCA databases include already the utilization factors.

5.3.3 Calculation

Once the methodology has been selected and the data has been collected companies shall calculate their emissions from transportation and distribution activities in the following way.

- Fuel-based methodology: CO_2 Emissions = Fuel Used x Heating Value x Emission factor

- Distance-based methodology to calculate CO_2 emissions for transportation

  CO_2 Emissions = Distance Travelled (km) x Emission factor (g/vkm) vkm = vehicle km

- Activity-based methodology to calculate CO_2 emissions for transportation

  CO_2 Emissions = Quantity **(**t) x Distance Travelled (km) x Emission factor (g/t-km)

- Methodology for storage: CO_2 emissions = storage days x emission factor
- Methodology for terminals: CO_2 emissions = unit x emission factor

To calculate emissions from transportation, refer to:

- GHG Protocol Calculation Tool, "Mobile Combustion GHG Emissions Calculation Tool. Version 2.0. June 2009" Developed by World Resources Institute, available at http://www.ghgprotocol.org.

Table 5.1 gives guidance on the calculations for the distance-based methodology.

5.4 Case studies and examples

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Table 5.1: Guidance on the Calculations for the Distance-based Methodology

MODE	VEHICLE	UNIT	PRIMARY	SECONDARY	Comments	Assumptions
Air	Freighter short-haul	kg CO2e/t*km	Carrier	ICAO Environmental Reports of air carriers LCA databases	Carrier can provide a) shipment specific emissions b) trade-line emissions based on existing network design and historical plane consumption c) emissions per type of plane	
	Freighter long- haul	kg CO2e/t*km				
	Belly-freight short-haul	kg CO2e/t*km				
	Belly-freight long-haul	kg CO2e/t*km				
	Passenger plane short-haul	kg CO2e/t*km				
	Passenger plane long-haul	kg CO2e/t*km				
Ship	Container vessel <2000 TEU	kg CO2e/TEU*km	Carrier	IMO CCWG LCA-IO databases	Carrier can provide a) shipment specific emissions b) trade-line emissions based on existing network design and historical vessel consumption c) emissions per type of vessel	Default 1 TEU = 10 t
	Container vessel 2000-5000 TEU	kg CO2e/TEU*km				
	Container vessel 5000-8000 TEU	kg CO2e/TEU*km				
	Container vessel >8000TEU	kg CO2e/TEU*km				
	Bulk vessel <20000 dwt	kg CO2e/t*km				
	Bulk vessel >20000 dwt	kg CO2e/t*km				
Rail	Electric	kg CO2e/t*km	Operator	ecotransit LCA - IO databases	Operator can provide shipment specific emissions or trade-line historical emissions	
	Diesel	kg CO2e/t*km				
Truck	Van <3.5t	kg CO2e/t*km	Trucker	ecotransit NTM TREMOVE (EU) Mobile (US) LCA-IO databases	Trucker can provide a) shipment specific emissions b) trade-line emissions based on existing network design and historical fleet consumption c) emissions per type of truck	Default 1 TEU = 10 t
	Truck 3.5-7.5t	kg CO2e/t*km				
	Truck 7.5t-16t	kg CO2e/t*km				
	Truck 16t-32t single axle	kg CO2e/t*km kg CO2e/TEU*km				
	Truck >32t tractor and trailer or flatbed	kg CO2e/t*km kg CO2e/TEU*km				
Warehouse	Dry warehouse	kg CO2e/pallet*day kg CO2e/TEU*day kg CO2e/cbm*day kg CO2e/kg*day	Operator	LCA - IO databases	Operator may also have the emission factor based on the warehouse surface	1 pallet = 1 sqm
	Refrigerated warehouse	kg CO2e/pallet*day kg CO2e/TEU*day kg CO2e/cbm*day kg CO2e/kg*day				
Terminal	Terminal	kg CO_2 e/t kg CO2e/TEU	Terminal owner	LCA - IO databases		1 TEU = 10 t

6. Business Travel

6.1 Description

Business travel includes transportation to move employees to accomplish business-related activities in vehicles owned or operated by third parties.

This category excludes:

- Vehicles owned and leased by the reporting company, which are accounted under Scope 1 or as leased assets under Scope 3; and
- Employee commuting, which is accounted under employee commuting.

Emissions from business travel include the emissions from the combustion of fuels in vehicles (e.g., the fuel consumed by an aircraft), but not the life cycle emissions associated with manufacturing capital equipment and infrastructure (e.g. the emissions associated with manufacturing the aircraft).

Organizations may opt to include emissions from business travelers staying in hotels.

A reporting company's scope 3 emissions from business travel are the scope 1 and 2 emissions of airlines; railroads, bus operators; rental car companies; employees reimbursed for organizational travel; hotel operators; etc.

6.2 Determining relevant emissions

To determine which scope 3 activities are most significant in size, companies should follow these steps:

1. Use screening methods to individually estimate the emissions from all scope 3 activities.
2. Express each individual scope 3 activity's estimated emissions as a fraction of total anticipated scope 3 emissions.
3. Rank all scope 3 activities from largest to smallest to determine which activities are most significant.

Companies may use either:

- An emissions-based screening assessment, or
- A financial-based screening assessment.

Companies should give preference to an emissions-based screening assessment over a financial-based screening assessment, since an emissions-based approach more closely approximates actual emissions.

Companies shall account for and report the largest scope 3 sources that collectively account for at least 80% of total anticipated scope 3 emissions.[34]

6.2.1. Emissions-based screening assessments

- Estimated total air distance traveled (km) x average emission factor for air travel (kg CO_2-e/passenger-km) + estimated total road distance traveled (km) x average emission factor for road travel (kg CO_2-e/passenger-km) + estimated total rail distance traveled (km) x average emission factor for rail travel (kg CO_2-e/passenger-km)
- Total expenditure on business travel (dollars) x average emission factor (kg CO_2-e/dollar) using input-output databases

[34] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

- Refer to an industry checklist based on input-output databases to determine if business travel is expected to be a high priority category (to be provided)

6.2.2 Financial-based screening assessments

- Expenditure on business travel as a share of total expenditures (%)

6.2.3 Other Criteria for Determining Relevant Emissions

In addition to accounting for all activities that collectively account for 80% of total anticipated scope 3 emissions in terms of size,[35] companies should consider other criteria to determine whether additional scope 3 activities should be accounted for and reported.

Scope 3 activities should be considered relevant if they meet any of the following criteria:

1. There are potential emissions reductions that could be undertaken or influenced by the company
2. They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and technology, compliance/litigation, reputational and physical risks)
3. They are deemed critical by key stakeholders (e.g., feedback from customers, suppliers, investors or civil society)
4. They are an outsourced activity that is typically insourced by other companies in the reporting company's sector
5. They meet additional criteria developed by the company or industry sector

6.3 Calculating emissions

Calculating emissions from business travel involves multiplying activity data (i.e., person-kilometers travelled by mode of transport) by emission factors (typically default national emission factors by mode of transport). Modes of transport include aircraft, rail, subway, bus, automobile, etc.

Companies should track total annual distance traveled by transport mode. Methods of data collection include:

- Automatic tracking of distance traveled through a travel agency
- Adding distance traveled and mode of transport to travel forms completed by employees (e.g. existing expense reporting forms)

Companies may extrapolate from a representative sample of employees to represent the total business travel of all employees. The activity data should be summed to obtain total annual person-kilometers traveled by each mode of transport.

To calculate emissions from business travel, refer to:

- GHG Protocol Calculation Tool, "Mobile Combustion GHG Emissions Calculation Tool. Version 2.0. June 2009" Developed by World Resources Institute, available at http://www.ghgprotocol.org.
- US EPA Climate Leaders GHG Inventory Protocol, "Optional Emissions from Commuting, Business Travel and Product Transport," available at: nohttp://www.epa.gov/stateply/documents/resources/commute_travel_product.pdf

[35] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

6.4 Case studies and examples

World Resources Institute: Scope 3 Emissions from Air Travel, 2007

		Source of emissions	Activity data	Emission factor	Metric tons of CO_2
Scope 3 (air travel)		*Air travel, short flights*	*67,947 km*	*0.15 kg of CO_2/km*	*10*
		Air travel, medium flights	*586,313 km*	*0.12 kg of CO_2/km*	*70*
		Air travel, long flights	*5,608,093 km*	*0.11 kg of CO_2/km*	*617*
				Total	**697 tCO_2**

Note: The emission factors in the table above are illustrative only and should not be used to calculate emissions. Refer to the tools referenced above for the most up-to-date emission factors.

7. Waste Generated in Operations

7.1 Description

This category includes emissions from the transportation, disposal and/or treatment of wastes generated as a result of operations.

A reporting company's scope 3 emissions are the scope 1, 2 and 3 emissions of the waste / wastewater management organization.

Disposal of wastes (landfilling, combustion) results in potentially significant greenhouse gas emissions. Landfilling of organic wastes results in anaerobic decomposition and methane generation, a greenhouse gas with a higher global warming potential than CO_2. Combustion of fossil based components without energy recovery constitutes disposal and releases fossil based CO_2 emissions. Transportation of wastes from the point of generation to the disposal site also results in greenhouse gas emissions.

7.2 Determining relevant emissions

To determine which scope 3 activities are most significant in size, companies should follow these steps:

1. Use screening methods to individually estimate the emissions from all scope 3 activities.
2. Express each individual scope 3 activity's estimated emissions as a fraction of total anticipated scope 3 emissions.
3. Rank all scope 3 activities from largest to smallest to determine which activities are most significant.

Companies may use either:

- An emissions-based screening assessment, or
- A financial-based screening assessment.

Companies should give preference to an emissions-based screening assessment over a financial-based screening assessment, since an emissions-based approach more closely approximates actual emissions.

Companies shall account for and report the largest scope 3 sources that collectively account for at least 80% of total anticipated scope 3 emissions.[36]

7.2.1. Emissions-based screening assessments

- For solid waste: Mass of waste x Average carbon content of waste (30% default) x average methane content of landfill gas (0.5 default) x 16/12 x CH_4 Global Warming Potential
- For wastewater treatment: Annual wastewater discharged (m^3) x Average chemical oxygen demand, COD (kg / m^3) x IPCC Default maximum CH_4 producing capacity (0.25 kg CH_4 / kg COD) x CH_4 Global Warming Potential

7.2.2 Financial-based screening assessments

- Expenditure on waste disposal/treatment as a share of total expenditures (%)

7.2.3 Other Criteria for Determining Relevant Emissions

In addition to accounting for all activities that collectively account for 80% of total anticipated scope 3 emissions in terms of size, companies should consider other criteria to determine whether additional scope 3 activities should be accounted for and reported.

Scope 3 activities should be considered relevant if they meet any of the following criteria:

1. There are potential emissions reductions that could be undertaken or influenced by the company
2. They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and technology, compliance/litigation, reputational and physical risks)
3. They are deemed critical by key stakeholders (e.g., feedback from customers, suppliers, investors or civil society)
4. They are an outsourced activity that is typically insourced by other companies in the reporting company's sector
5. They meet additional criteria developed by the company or industry sector

7.3 Calculating emissions

7.4 Case studies and examples

[36] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

8. Franchises Not Included in Scope 1 and 2 (Upstream)

8.1 Description

This category includes emissions of a franchisor's operations, reported by the franchisee.

- *Note: This category is only applicable to companies that own or operate franchises.*
- *Note: This category is reported by the franchisor, not the franchisee. (Franchisees should refer to Section 11 of Part 2).*

A reporting company's scope 3 emissions from franchises (upstream) are the scope 1, 2 and 3 emissions of the franchisor.

8.2 Determining relevant emissions

To determine which scope 3 activities are most significant in size, companies should follow these steps:

1. Use screening methods to individually estimate the emissions from all scope 3 activities.
2. Express each individual scope 3 activity's estimated emissions as a fraction of total anticipated scope 3 emissions.
3. Rank all scope 3 activities from largest to smallest to determine which activities are most significant.

Companies may use either:

- An emissions-based screening assessment, or
- A financial-based screening assessment.

Companies should give preference to an emissions-based screening assessment over a financial-based screening assessment, since an emissions-based approach more closely approximates actual emissions.

Companies shall account for and report the largest scope 3 sources that collectively account for at least 80% of total anticipated scope 3 emissions.[37]

8.2.1. Emissions-based screening assessments

- Total franchisor corporate emissions (tonnes CO_2-e), as reported by the franchisor

8.2.2 Financial-based screening assessments

- Expenditure on franchise operations as a share of total expenditures (%)

8.2.3 Other Criteria for Determining Relevant Emissions

In addition to accounting for all activities that collectively account for 80% of total anticipated scope 3 emissions in terms of size, companies should consider other criteria to determine whether additional scope 3 activities should be accounted for and reported.

Scope 3 activities should be considered relevant if they meet any of the following criteria:

1. There are potential emissions reductions that could be undertaken or influenced by the company

[37] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

2. They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and technology, compliance/litigation, reputational and physical risks)
3. They are deemed critical by key stakeholders (e.g., feedback from customers, suppliers, investors or civil society)
4. They are an outsourced activity that is typically insourced by other companies in the reporting company's sector
5. They meet additional criteria developed by the company or industry sector

8.3 Calculating emissions

8.4 Case studies and examples

9. Leased Assets Not Included in Scope 1 and 2 (Upstream)

9.1 Description

Emissions from the manufacturing, construction, or operation of leased assets not included in the Lessee's Scope 1 or 2 emissions.

- *Note: This category is only applicable to companies that operate leased assets.*

A reporting company's scope 3 emissions from leased assets are the scope 1, 2 and 3 emissions of the owner of the leased asset (i.e, lessor).

9.2 Determining relevant emissions

To determine which scope 3 activities are most significant in size, companies should follow these steps:

1. Use screening methods to individually estimate the emissions from all scope 3 activities.
2. Express each individual scope 3 activity's estimated emissions as a fraction of total anticipated scope 3 emissions.
3. Rank all scope 3 activities from largest to smallest to determine which activities are most significant.

Companies may use either:

- An emissions-based screening assessment, or
- A financial-based screening assessment.

Companies should give preference to an emissions-based screening assessment over a financial-based screening assessment, since an emissions-based approach more closely approximates actual emissions.

Companies shall account for and report the largest scope 3 sources that collectively account for at least 80% of total anticipated scope 3 emissions.[38]

9.2.1. Emissions-based screening assessments

- Conservative method: Number of leased assets x emissions of highest emitting leased asset (tonnes CO_2-e)

[38] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

- Average method: Number of leased asset x industry average emissions per leased asset (tonnes CO_2-e)
- For commercial assets (office, warehouse, retail) & light manufacturing: floor space (sq m) x published average emission factor (kg CO_2-e/sq m) by building type

9.2.2 Financial-based screening assessments

- Expenditure on leased assets as a share of total expenditures (%)

9.2.3 Other Criteria for Determining Relevant Emissions

In addition to accounting for all activities that collectively account for 80% of total anticipated scope 3 emissions in terms of size,[39] companies should consider other criteria to determine whether additional scope 3 activities should be accounted for and reported.

Scope 3 activities should be considered relevant if they meet any of the following criteria:

1. There are potential emissions reductions that could be undertaken or influenced by the company
2. They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and technology, compliance/litigation, reputational and physical risks)
3. They are deemed critical by key stakeholders (e.g., feedback from customers, suppliers, investors or civil society)
4. They are an outsourced activity that is typically insourced by other companies in the reporting company's sector
5. They meet additional criteria developed by the company or industry sector

9.3 Calculating emissions

9.4 Case studies and examples

10. Investments Not Included in Scope 1 and 2

10.1 Description

This category includes GHG emissions associated with investments, including fixed asset investments and equity assessment not included in scope 1 and 2. Depending on its selection of a consolidation approach (equity share, operational control or financial control), a company will include and exclude certain equity assets from its corporate boundary. All wholly owned, partially owned, or controlled assets that do not fall into scope 1 or 2 are accounted for as scope 3 emissions, including group companies/subsidiaries, associated/affiliated companies, non-incorporated joint ventures/partnerships/operations where partners have joint financial control, etc.

Fixed asset investments are investments where the reporting company has neither significant influence nor financial control. Fixed asset investments are not accounted under the equity share or financial control approach as scope 1 and 2 emissions, but are accounted as scope 3 emissions.

For more information, see the *GHG Protocol Corporate Standard*, Chapter 3: "Setting Organizational Boundaries."

[39] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

A reporting company's scope 3 emissions from investments are the scope 1, 2, and 3 emissions of the companies receiving investment.

Note that this category does not refer to investments in the financial services sector. For companies in the financial sector, investments are accounted for as scope 3 emissions from the use of sold products and services. See Section 13 for more information on scope 3 emissions from the use of sold products.

10.2 Determining relevant emissions

To determine which scope 3 activities are most significant in size, companies should follow these steps:

1. Use screening methods to individually estimate the emissions from all scope 3 activities.
2. Express each individual scope 3 activity's estimated emissions as a fraction of total anticipated scope 3 emissions.
3. Rank all scope 3 activities from largest to smallest to determine which activities are most significant.

Companies may use either:

- An emissions-based screening assessment, or
- A financial-based screening assessment.

Companies should give preference to an emissions-based screening assessment over a financial-based screening assessment, since an emissions-based approach more closely approximates actual emissions.

Companies shall account for and report the largest scope 3 sources that collectively account for at least 80% of total anticipated scope 3 emissions.[40]

10.2.1. Emissions-based screening assessments

- For each equity investment: Equity share in company/project (%) x estimated emissions for company/project (tonnes CO_2-e)

10.2.2 Financial-based screening assessments

- Share (%) of total equity assets not included in the company's organizational boundary (i.e. scope 1 and 2 emissions)
- Fixed asset investments as a share (%) of total equity assets

10.2.3 Other Criteria for Determining Relevant Emissions

In addition to accounting for all activities that collectively account for 80% of total anticipated scope 3 emissions in terms of size, companies should consider other criteria to determine whether additional scope 3 activities should be accounted for and reported.

Scope 3 activities should be considered relevant if they meet any of the following criteria:

1. There are potential emissions reductions that could be undertaken or influenced by the company
2. They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and technology, compliance/litigation, reputational and physical risks)

[40] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

3. They are deemed critical by key stakeholders (e.g., feedback from customers, suppliers, investors or civil society)
4. They are an outsourced activity that is typically insourced by other companies in the reporting company's sector
5. They meet additional criteria developed by the company or industry sector

10.3 Calculating emissions

10.4 Case studies and examples

Downstream Emissions

Downstream emissions are the emissions that occur in the life cycle of outputs (i.e., sold goods and services) subsequent to sale by the reporting company. These include the scope 1 and 2 emissions of a company's customers. Downstream emissions include the distribution, use, and disposal of sold products.

11. Franchises (Downstream)

11.1 Description

This category includes emissions from the manufacturing/construction and operation of franchises, reported by the franchisor.

- *Note: This category is only applicable to companies that have franchises.*
- *Note: This category is reported by the franchisee, not the franchisor. (Franchisors should refer to Section 8 of Part 2).*

A reporting company's scope 3 emissions from franchises (downstream) are the scope 1, 2 and 3 emissions of the franchisee.

11.2 Determining relevant emissions

To determine which scope 3 activities are most significant in size, companies should follow these steps:

1. Use screening methods to individually estimate the emissions from all scope 3 activities.
2. Express each individual scope 3 activity's estimated emissions as a fraction of total anticipated scope 3 emissions.
3. Rank all scope 3 activities from largest to smallest to determine which activities are most significant.

Companies may use either:

- An emissions-based screening assessment, or
- A financial-based screening assessment.

Companies should give preference to an emissions-based screening assessment over a financial-based screening assessment, since an emissions-based approach more closely approximates actual emissions.

Companies shall account for and report the largest scope 3 sources that collectively account for at least 80% of total anticipated scope 3 emissions.[41]

11.2.1. Emissions-based screening assessments

- Conservative method: Number of franchises x emissions of highest emitting franchise (tonnes CO_2-e)
- Average method: Number of franchises x industry average emissions per franchise (tonnes CO_2-e)

[41] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

- For commercial assets (office, warehouse, retail) & light manufacturing:: floor space (sq m) x published average emission factor (kg CO_2-e /sq m) by building type

11.2.2 Financial-based screening assessments

- Revenues from franchise-operated operations as a share of your organization's total revenues (%)

11.2.3 Other Criteria for Determining Relevant Emissions

In addition to accounting for all activities that collectively account for 80% of total anticipated scope 3 emissions in terms of size,[42] companies should consider other criteria to determine whether additional scope 3 activities should be accounted for and reported.

Scope 3 activities should be considered relevant if they meet any of the following criteria:

1. There are potential emissions reductions that could be undertaken or influenced by the company
2. They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and technology, compliance/litigation, reputational and physical risks)
3. They are deemed critical by key stakeholders (e.g., feedback from customers, suppliers, investors or civil society)
4. They are an outsourced activity that is typically insourced by other companies in the reporting company's sector
5. They meet additional criteria developed by the company or industry sector

11.3 Calculating emissions

11.4 Case studies and examples

12. Leased Assets (Downstream)

12.1 Description

Emissions from the manufacturing, construction, or operation of leased assets not included in the lessor's scope 1 or 2 emissions.

- *Note: This category is only applicable to companies that own assets that are leased to other entities.*

A reporting company's scope 3 emissions from leased assets (downstream) are the scope 1, 2 and 3 emissions of the lessee.

12.2 Determining relevant emissions

To determine which scope 3 activities are most significant in size, companies should follow these steps:

1. Use screening methods to individually estimate the emissions from all scope 3 activities.
2. Express each individual scope 3 activity's estimated emissions as a fraction of total anticipated scope 3 emissions.

[42] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

3. Rank all scope 3 activities from largest to smallest to determine which activities are most significant.

Companies may use either:

- An emissions-based screening assessment, or
- A financial-based screening assessment.

Companies should give preference to an emissions-based screening assessment over a financial-based screening assessment, since an emissions-based approach more closely approximates actual emissions.

Companies shall account for and report the largest scope 3 sources that collectively account for at least 80% of total anticipated scope 3 emissions.[43]

12.2.1. Emissions-based screening assessments

- Conservative method: Number of leased assets x emissions of highest emitting leased asset (tonnes CO_2-e)
- Average method: Number of leased asset x industry average emissions per leased asset (tonnes CO_2-e)
- For commercial assets (office, warehouse, retail) & light manufacturing: floor space (sq m) x published average emission factor (kg CO_2-e/sq m) by building type

12.2.2 Financial-based screening assessments

- Revenues from leased assets as a share of your organization's total revenues (%)

12.2.3 Other Criteria for Determining Relevant Emissions

In addition to accounting for all activities that collectively account for 80% of total anticipated scope 3 emissions in terms of size, companies should consider other criteria to determine whether additional scope 3 activities should be accounted for and reported.

Scope 3 activities should be considered relevant if they meet any of the following criteria:

1. There are potential emissions reductions that could be undertaken or influenced by the company
2. They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and technology, compliance/litigation, reputational and physical risks)
3. They are deemed critical by key stakeholders (e.g., feedback from customers, suppliers, investors or civil society)
4. They are an outsourced activity that is typically insourced by other companies in the reporting company's sector
5. They meet additional criteria developed by the company or industry sector

12.3 Calculating emissions

12.4 Case studies and examples

[43] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

13. Transportation & Distribution (Downstream / Outbound)

13.1 Description

This category includes the emissions from transportation and distribution (including warehousing) of sold products in vehicles, warehouses and other facilities not under the ownership or control of the reporting company.

This category includes the emissions from:

13.1 Transportation & distribution of sold products in vehicles not owned or controlled by the reporting company

13.2 Warehousing & storage of sold products in warehouses and other facilities not owned or controlled by the reporting company

13.3 Retail of sold products in facilities not owned or controlled by the reporting company

A reporting company's scope 3 emissions from transportation and distribution are the scope 1 and 2 emissions of third party logistics providers, retailers, etc. .

13.2 Determining relevant emissions

To determine which scope 3 activities are most significant in size, companies should follow these steps:

1. Use screening methods to individually estimate the emissions from all scope 3 activities.
2. Express each individual scope 3 activity's estimated emissions as a fraction of total anticipated scope 3 emissions.
3. Rank all scope 3 activities from largest to smallest to determine which activities are most significant.

Companies should use an emissions-based screening assessment for downstream transportation and distribution, since financial-based screening assessments are not applicable.

Companies shall account for and report the largest scope 3 sources that collectively account for at least 80% of total anticipated scope 3 emissions.[44]

13.2.1. Emissions-based screening assessments

13.1 Transportation and distribution of sold products	• For each product category: Mass or volume of sold products by transport mode (tonne) x average distance traveled (km) x average emission factor (kg CO_2-e per tonne-km) by mode; or • For each transportation mode (i.e., air, rail, truck, barge): total distance travelled (km) x total quantity transported (tonnes) x industry average emission factor (kg CO_2-e/tonne-km)
13.2 Warehousing of sold products	• Number of third party warehouses used to store products outbound of your company x conservative estimated storage space per warehouse (m^3) x industry average emission factor (kg CO_2-e/m^3)

[44] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

13.3 Retail of sold products	• Number of third party retail sites used to sell products x conservative estimated storage space per site (m^3) x industry average emission factor (kg CO_2-e/m^3)

13.2.2 Financial-based screening assessments

- N/A

13.2.3 Other Criteria for Determining Relevant Emissions

In addition to accounting for all activities that collectively account for 80% of total anticipated scope 3 emissions in terms of size,[45] companies should consider other criteria to determine whether additional scope 3 activities should be accounted for and reported.

Scope 3 activities should be considered relevant if they meet any of the following criteria:

1. There are potential emissions reductions that could be undertaken or influenced by the company
2. They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and technology, compliance/litigation, reputational and physical risks)
3. They are deemed critical by key stakeholders (e.g., feedback from customers, suppliers, investors or civil society)
4. They are an outsourced activity that is typically insourced by other companies in the reporting company's sector
5. They meet additional criteria developed by the company or industry sector

13.3 Calculating emissions

- *Refer to Part 2 Section 5 (Upstream transportation and distribution)*

13.4 Case studies and examples

[45] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

14. Use of Sold Products

14.1 Description

This category includes emissions from the use of products sold by the reporting company.

The emissions from a company's products in their use phase is a core element of the value chain emissions of a company. The use phase can be one of the most significant sources of emissions in the life cycle of products (e.g. fuels, cars, electrical and electronic equipment). In some cases, use phase emissions are an order of magnitude greater than emissions from manufacturing.

Reporting on product use phase emissions is in accordance with the concept of product stewardship, where the manufacturer takes responsibility for the environmental performance of products beyond the manufacturer's gate.

A reporting company's scope 3 emissions from the use of sold products are the scope 1 and 2 emissions of the customer or end user.

14.2 Determining relevant emissions

Emissions from the use of sold products shall be reported for the following product types:

- Products that consume energy (fuels or electricity) during use
- Fuels
- Products that contain GHGs that are emitted during use

Companies should report emissions from the use of sold products for other product types where the company has determined them to be relevant (see Table 14.1).

Emissions from the use of sold products shall be reported for all final products and for those intermediate products where the eventual end use of the product is known.

Reporting emissions from the use of sold products is not required for raw materials and intermediate products where the eventual end use of the product is unknown.[46]

Emissions from the use of sold products should optionally be reported for raw materials and intermediate products, where relevant.

Box 14.1. Final Products and Intermediate Products

Intermediate products are goods that are used as inputs in the production of other goods and services rather than entering the use stage in their current form. Intermediate products require further processing, transformation within the system, or inclusion in another product system before the use stage. Examples include steel bars, microchips, electrical motors, metals, resins, plastics, and machinery components (e.g., ball bearings).

Final products are goods and services that are ultimately consumed by the end user rather than used in the production of another good or service. Final products enter the use stage in their current form without further processing, transformation within the system, or inclusion in another product system before the use stage. Examples include a car, laptop computer, or vacuum cleaner.

[46] For example, a manufacturer of plastic resin may sell its product to a customer without knowing whether the plastic resin may eventually be transformed into plastic bottles, car parts, laptops, etc.

In some cases, the end user is a company producing other goods. These products are considered final goods rather than intermediate goods. Examples include catalysts, turbines, fuels, etc.

Products (e.g., consumer products) sold to retailers to be sold to consumers are final products because they are not processed or transformed before the use stage.

Table 14.1: Emissions from Use of Sold Products: Reporting Requirements by Product Type

1. Consumes energy (fuels or electricity) during use	Automobiles, aircraft, engines, motors, buildings, appliances, electronics, lighting	Report all
2. Fuels	Petroleum products, natural gas, coal, biofuels	Report all
3. Contains GHGs that are emitted during use	Aerosols, refrigerants, industrial gases, SF6, HFCs, PFCs, fire extinguishers	Report all
4. Indirectly consumes energy during use	Pots & pans (heating), textiles (washing), food (refrigeration)	Optional *Should report if significant in size, if the company has the ability to influence reductions, or if otherwise relevant*[47]
5. Other products that emit GHGs directly or indirectly during use	Fertilizers Financial products/services Others	Optional *Should report if significant in size, if the company has the ability to influence reductions, or if otherwise relevant*
6. Raw materials and intermediate goods where the eventual end use is unknown	Iron ore, cement	Optional
7. No GHG impact in the use phase	Furniture	Optional
8. When used, reduces the GHGs of other entities compared to a baseline	Wind turbine or solar panel (compared to coal plant); ICT (compared to air travel); CFL bulb (compared to incandescent bulb)	Optional *Report separately from scopes 1, 2, and 3*

[47] i.e., if reporting enables the reporting company to understand the emissions-intense areas of its value chain and the users of data to understand the relative impact of the company's value chain emissions and reduction activities.

14.3 Calculating emissions

Product use phase emissions should be calculated as the total expected lifetime emissions from all relevant products sold in the reporting year (e.g., the previous calendar year).

Example 14.1

An automaker manufactures one million cars in 2009. Each car has an expected lifetime of ten years. In 2010, the company reports the anticipated use phase emissions of the one million cars it produced in 2009 over their ten year expected lifetime.

Calculations of use phase emissions shall be based on sources listed below:

1. Published international standards that specify a use phase for the product;
2. Published national guidelines that specify a use phase for the product;
3. Published sector-specific guidelines that specify a use phase for the product being assessed.

Where no method for determining the use phase of products has been established in accordance with points 1-3 above, the approach taken shall be established by the reporting company.

Note: It is anticipated that, over time, sector-specific guidelines and other published material will increasingly form the basis of use phase emissions assessments.

The use phase and associated emissions may vary significantly from region to region: Use profiles should therefore specify the region(s) that they represent. To keep things simple, it is recommended that only the most common or average use case is described, with clear assumptions such as:

- Average temporal duration;
- Average amount of energy required;
- Type of energy/fuel used;
- Assumed average emission factors.

Example 14.2

Company A manufactures a product that uses electricity during its use phase. There are no sector-specific guidelines or other guidelines to specify the use phase of this product. However, company A has undertaken research regarding the durability of the product as well as patterns of usage among a large sample of customers. The product has an average life span of 5 years. The average user works with the product 3 hours per working day. The power consumption is 0.5 kWh per hour. The emission factor for the country the product is used in is 0.5 kg CO_2e/kWh. Based on this information, company A calculates the emissions associated with the use phase of their product.

Calculation of total GHG emissions associated with this product:

5 years x 200 working days x 2 hours/day x 0.5 kWh x 0.5 kg CO_2e/kWh = 500 kg CO_2e

Table 14.2: Emissions from Use of Sold Products: Examples of Calculations Methods by Product Type

Consumes fossil fuels in the use phase	Automobiles, engines, motors, buildings	Energy efficiency (Btu/hour) x average use (hours/year) x life span (years) x emission factor (GHG/Btu)
1. Consumes electricity in the use phase	Appliances, electronics, lighting, buildings	Energy efficiency (kW/hour) x average use (hours/year) x life span (years) x emission factor (GHG/kW)
Fossil fuels	Petroleum products, natural gas, coal	Quantity sold (tonnes) x emission factor (GHG/tonne)
Contains GHGs that are emitted during use	Aerosols, refrigerants, industrial gases, SF6, HFCs, PFCs, fire extinguishers	GHG contained per product (GHG/unit) x quantity sold (units)

Reporting of Data and Assumptions Used

Estimates of emissions from the use of sold product can vary widely depending on the assumptions and data used. The calculation of downstream emissions should be based on standardized assumptions and methodologies using publicly available data sets where available (e.g. from government agencies, industry groups, etc.). Companies shall disclose the calculation methodologies, assumptions, and data sets used to estimate emissions.

Reporting Additional Metrics

Companies should report additional information where relevant such as the energy or GHG efficiency of sold products, levels of product certification (e.g. Energy Star in the US), the relative impact of product use phase emissions compared to scope 1 and scope 2 emissions, etc.

14.4 Case studies and examples

15. Disposal of Sold Products at the End of Life

15.1 Description

This category includes emissions from the disposal of discarded finished products.

A reporting company's scope 3 emissions from disposal of sold products at the end of life are the scope 1, 2 and 3 emissions of the waste management organization or wastewater treatment plant.

Disposal of wastes (landfilling, combustion) results in potentially significant greenhouse gas emissions. Landfilling of organic wastes results in anaerobic decomposition and methane generation, a greenhouse gas with a higher global warming potential than CO_2. Combustion of fossil based components without energy recovery constitutes disposal and releases fossil based CO_2 emissions. Transportation of wastes from the point of generation to the disposal site also result in greenhouse gas emissions.

15.2 Determining relevant emissions

To determine which scope 3 activities are most significant in size, companies should follow these steps:

1. Use screening methods to individually estimate the emissions from all scope 3 activities.
2. Express each individual scope 3 activity's estimated emissions as a fraction of total anticipated scope 3 emissions.
3. Rank all scope 3 activities from largest to smallest to determine which activities are most significant.

Companies should use an emissions-based screening assessment for this category, since financial-based screening assessments are not applicable.

Companies shall account for and report the largest scope 3 sources that collectively account for at least 80% of total anticipated scope 3 emissions.[48]

15.2.1. Emissions-based screening assessments

- Estimated mass of finished goods x Average carbon content of waste (30% default) x average methane content of landfill gas (0.5 default) x 16/12 x CH_4 Global Warming Potential

15.2.2 Financial-based screening assessment

- N/A

15.2.3 Other Criteria for Determining Relevant Emissions

In addition to accounting for all activities that collectively account for 80% of total anticipated scope 3 emissions in terms of size,[49] companies should consider other criteria to determine whether additional scope 3 activities should be accounted for and reported.

Scope 3 activities should be considered relevant if they meet any of the following criteria:

1. There are potential emissions reductions that could be undertaken or influenced by the company
2. They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and technology, compliance/litigation, reputational and physical risks)
3. They are deemed critical by key stakeholders (e.g., feedback from customers, suppliers, investors or civil society)
4. They are an outsourced activity that is typically insourced by other companies in the reporting company's sector
5. They meet additional criteria developed by the company or industry sector

15.3 Calculating emissions

15.4 Case studies and examples

[48] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

[49] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

Other Scope 3 Emissions

Other scope 3 emissions are limited to employee activities such as commuting, which are neither purchased nor sold. These include the scope 1 and 2 emissions of a company's employees.

16. Employee Commuting

16.1 Description

Employee commuting includes the travel of employees between their homes and primary worksites or between their homes and alternate worksites.

This category may also include other employee activities such as teleworking (i.e., employees working from home in a formal or ad hoc teleworking program).

A reporting company's scope 3 emissions from employee commuting are the scope 1, 2 and 3 emissions of its employees.

16.2 Determining relevant emissions

To determine which scope 3 activities are most significant in size, companies should follow these steps:

1. Use screening methods to individually estimate the emissions from all scope 3 activities.
2. Express each individual scope 3 activity's estimated emissions as a fraction of total anticipated scope 3 emissions.
3. Rank all scope 3 activities from largest to smallest to determine which activities are most significant.

Companies should use an emissions-based screening assessment for employee commuting, since financial-based screening assessments are not applicable.

Companies shall account for and report the largest scope 3 sources that collectively account for at least 80% of total anticipated scope 3 emissions.[50]

16.2.1. Emissions-based screening assessment

- Total number of employees x average (conservative) distance from place of work (km) x 10 trips per week x 52 weeks per year x national average emission factor of private vehicle (kg CO_2-e/passenger-km)

16.2.2. Financial-based screening assessment

- N/A

16.2.3 Other Criteria for Determining Relevant Emissions

In addition to accounting for all activities that collectively account for 80% of total anticipated scope 3 emissions in terms of size, companies should consider other criteria to determine whether additional scope 3 activities should be accounted for and reported.

Scope 3 activities should be considered relevant if they meet any of the following criteria:

[50] Exclusive of Category 1 (Purchased Goods and Services – Direct Supplier Emissions) and Category 14 (Use of Sold Products)

1. There are potential emissions reductions that could be undertaken or influenced by the company
2. They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and technology, compliance/litigation, reputational and physical risks)
3. They are deemed critical by key stakeholders (e.g., feedback from customers, suppliers, investors or civil society)
4. They are an outsourced activity that is typically insourced by other companies in the reporting company's sector
5. They meet additional criteria developed by the company or industry sector

16.3 Calculating emissions

Calculating emissions from employee commuting involves multiplying activity data (i.e., person-kilometers travelled by mode of transport) by emission factors (typically default national emission factors by mode of transport). Modes of transport include rail, subway, bus, automobile, bicycle, walking, etc.

Companies should survey their employees annually to obtain information on average commuting habits. The company should seek information on:

- Average one-way distance traveled by employee per day
- Mode(s) of transport used by employees

Companies should collect employee commuting data from as many employees as possible. However, for large organizations, some use of extrapolation may be necessary. Companies may extrapolate from a representative sample of employees to represent the total commuting patterns of all employees.

Companies should convert daily commuting distance into annual commuting distance by multiplying the one-way distance by two for the return trip and by the number of days worked per year (i.e., excluding weekends and days spent on business travel, on vacation, working from home, etc). The activity data should be summed to obtain total annual person-kilometers traveled by each mode of transport.

For a sample survey, refer to:

- GHG Protocol Calculation Tool, "CO_2 Emissions from Employee Commuting. Version 2.0. June 2006" Developed by World Resources Institute, available at http://www.ghgprotocol.org.

To calculate emissions from employee commuting, refer to:

- GHG Protocol Calculation Tool, "CO_2 Emissions from Employee Commuting. Version 2.0. June 2006" Developed by World Resources Institute, available at http://www.ghgprotocol.org.
- US EPA Climate Leaders GHG Inventory Protocol, "Optional Emissions from Commuting, Business Travel and Product Transport," available at: nohttp://www.epa.gov/stateply/documents/resources/commute_travel_product.pdf

16.4 Case studies and examples

World Resources Institute: Scope 3 Emissions from Employee Commuting, 2007

		Source of emissions	Activity data	Emission factor	Metric tons of CO_2
Scope 3 (employee commuting)		*Bus*	*23,011 miles*	*0.30 kg of CO_2/mile*	*7*
		*Metro*	*225,201 miles*	*0.17 kg of CO_2/mile*	*38*
		*Commuter rail*	*150,423 miles*	*0.31 kg of CO_2/mile*	*47*
		*Car*	*2,254 gallons of gas*	*8.87 kg of CO_2/gallon*	*20*
		*Walk/bike*	*39,192 miles*	*0*	*0*
				Total	**112 tCO_2**

Note: The emission factors in the table above are illustrative only and should not be used to calculate emissions. Refer to the tools referenced above for the most up-to-date emission factors.

Glossary

Term	Definition
Activity data	A quantitative measure of a level of activity that results in GHG emissions or removals. Examples of activity data include kilowatt-hours of electricity used, volume of fuel used, output of a process, hours a piece of equipment is operated, distance travelled, and area of a building. Activity data are multiplied by an emissions factor to derive the GHG emissions associated with a process or an operation.
Assurance	When an assurance provider expresses a conclusion designed to enhance the degree of confidence of the intended users (other than the preparer of the GHG inventory report) over the measurement of the GHG inventory and the Scope 3 emissions included therein against defined criteria.
Audit trail	Well organized and transparent historical records documenting how an inventory was compiled.
CO_2 equivalent (CO_2-e)	The universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. It is used to evaluate releasing (or avoiding releasing) different greenhouse gases against a common basis.
Control	The ability of a company to direct the policies of another operation. More specifically, it is defined as either operational control (the organization or one of its subsidiaries has the full authority to introduce and implement its operating policies at the operation) or financial control (the organization has the ability to direct the financial and operating policies of the operation with a view to gaining economic benefits from its activities).
Downstream emissions	Indirect GHG emissions that occur in the life cycle of outputs (i.e., sold goods and services) subsequent to sale by the reporting company.
Emission factor	A factor allowing GHG emissions to be estimated from a unit of available activity data (e.g. tonnes of fuel consumed, tonnes of product produced) and absolute GHG emissions.
Emissions	The release of GHG into the atmosphere.
Extrapolated data	Primary or secondary data related to a similar (but not representative) input, process, or activity to the one in the inventory, which are adapted or customized to a new situation to make more representative (for example, by customizing the data to the relevant region, technology, process, temporal period and/or product).
Final product	Goods and services that are ultimately consumed by the end user rather than used in the production of another good or service. Final products enter the use stage in their current form without further processing, transformation within the system, or inclusion in another product system before the use stage.
Global Warming Potential (GWP)	A factor describing the radiative forcing impact (degree of harm to the atmosphere) of one unit of a given GHG relative to one unit of CO_2.
Greenhouse gas inventory	A quantified list of an organization's GHG emissions and sources.
Greenhouse gases (GHG)	For the purposes of this standard, GHGs are the six gases listed in the Kyoto Protocol: carbon dioxide (CO_2); methane (CH_4); nitrous oxide (N_2O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); and sulphur hexafluoride (SF_6).
Intermediate product	Goods that are used as inputs in the production of other goods and services rather than entering the use stage in their current form. Intermediate products require further processing, transformation within the system, or inclusion in another product system before the use stage.

Life cycle	Consecutive and interlinked stages of a product system, from raw material acquisition or generation of natural resources to end of life.
Material discrepancy	An error (for example, from an oversight, omission, miscalculation or fraud) that results in a reported quantity or statement being sufficiently different from the true value or meaning to influence a user's decisions.
Materiality threshold	A concept employed in the process of verification. It is often used to determine whether an error or omission is a material discrepancy or not. It should not be viewed as a de minimus for defining a complete inventory.
Operational boundaries	The boundaries that determine the direct and indirect emissions associated with operations owned or controlled by the reporting company. This assessment allows a company to establish which operations and sources cause direct and indirect emissions, and to decide which indirect emissions to include that are a consequence of its operations.
Organizational boundaries	The boundaries that determine the operations owned or controlled by the reporting company, depending on the consolidation approach taken (equity or control approach).
Outsourcing	The contracting out of activities to other businesses.
Primary data	Direct emissions measurements or activity data collected from specific processes within a product's life cycle or specific sources within a company's operations or its supply chain.
Product	Any good or service.
Proxy data	Primary or secondary data related to a similar (but not representative) input, process, or activity to the one in the inventory, which are directly transferred or generalized to the input, process, or activity of interest without being adapted or customized to make more representative.
Reporting	Presenting data to internal management and external users such as regulators, shareholders, the general public or specific stakeholder groups.
Scope	Defines the operational boundaries in relation to indirect and direct GHG emissions.
Scope 1 Inventory	A reporting organization's direct GHG emissions
Scope 2 Inventory	A reporting organization's emissions associated with the generation of electricity, heating/ cooling, or steam purchased for own consumption.
Scope 3 Inventory	A reporting organization's indirect emissions other than those covered in scope 2. A company's scope 3 inventory includes the upstream and downstream emissions of the reporting company.
Secondary data	Data that are not collected from specific processes within a product's life cycle or specific sources within a company's operations or its supply chain. Secondary data include industry-average data, data from literature studies, and data from published databases.
Supply chain	A network of organizations (e.g., manufacturers, wholesalers, distributors and retailers) involved in the production, delivery, and sale of a product to the consumer.
Uncertainty	1. Statistical definition: A parameter associated with the result of a measurement that characterizes the dispersion of the values that could be reasonably attributed to the measured quantity. (e.g. the sample variance or coefficient of variation). 2. Inventory definition: A general and imprecise term which refers to the lack of certainty in emissions-related data resulting from any causal factor, such as the application of non-representative factors or methods, incomplete data on sources and sinks, lack of transparency etc. Reported uncertainty information typically specifies a quantitative estimates of the likely or perceived difference between a reported value and qualitative description of the likely causes of the difference.
Upstream emissions	Indirect GHG emissions that occur in the life cycle of inputs (i.e., purchased or acquired goods, services, materials, and fuels), up to the point of receipt by the

	reporting company.
Value chain emissions	The total scope 1, scope 2, and scope 3 emissions of a company, including emissions from the upstream and downstream activities associated with the operations of the reporting company.

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Appendix A: GHG Protocol Guidance and Tools

GHG Protocol Publication Available at http://www.ghghprotocol.org	Date
A Corporate Accounting and Reporting Standard	April 2004
GHG Protocol for Project Accounting	December 2005
Guidance for Quantifying GHG Reductions from Grid – Connected Electricity Projects	July 2007
Land Use, Land – Use Change and Forestry Guidance for GHG Project Accounting	November 2006
Designing a Customized GHG Calculation Tool	June 2007
Hot Climate, Cool Commerce: A Service sector Guide to Greenhouse Gas Management	May 2006
Working 9 to 5: A Guide for Small Office – based Organizations	December 2002
Measuring to Manage: A Guide to Designing GHG Accounting and Reporting Programs	December 2007

GHG Protocol Emissions Calculation Tools Available at http://www.ghghprotocol.org	Date
Cross Sector Tools	
GHG Emissions from Stationary Combustion	February 2009
GHG Emissions from Purchased Electricity, Heat, or Steam	June 2009
GHG Emissions from Transport or Mobile Sources	June 2009
Emissions from Employee Commuting	June 2006
Measurement and Estimation of Uncertainty of GHG Emissions	September 2003
Allocation of Emissions from a Combined Heat and Power Plant	September 2006
Compilation of Emission Factors Used in Cross Sector Tools	July 2009
Sector Specific Calculation Tools	
GHG Emissions from the Production of Aluminum	March 2008
CO2 Emissions from the Production of Cement (US EPA)	August 2002
CO2 Emissions from the Production of Iron and Steel	March 2008
CO2 Emissions from the Production of Lime	March 2008
CO2 Emissions from the Production of Ammonia	March 2008
CO2 Emissions from the Production of Cement	June 2005
N2O Emissions from the Production of Nitric Acid	March 2008
HFC–23 Emissions from the Production of HCFC-22	March 2008
GHG Emissions from Pulp and Paper Mills	December 2008
N2O Emissions from the production of Adipic Acid	March 2008
HFC and PFC emissions from the manufacturing, installation, operation and disposal of refrigeration and air-conditioning equipment	January 2005
PFC emissions from the production of semiconductor wafers	October 2001
GHG emissions from wood products facilities	July 2005