

# CARBON ACCOUNTING METHODS FOR ESTIMATING SCOPE 3 EMISSIONS

Understanding a company's GHG emissions is the first step for an effective corporate climate change strategy.



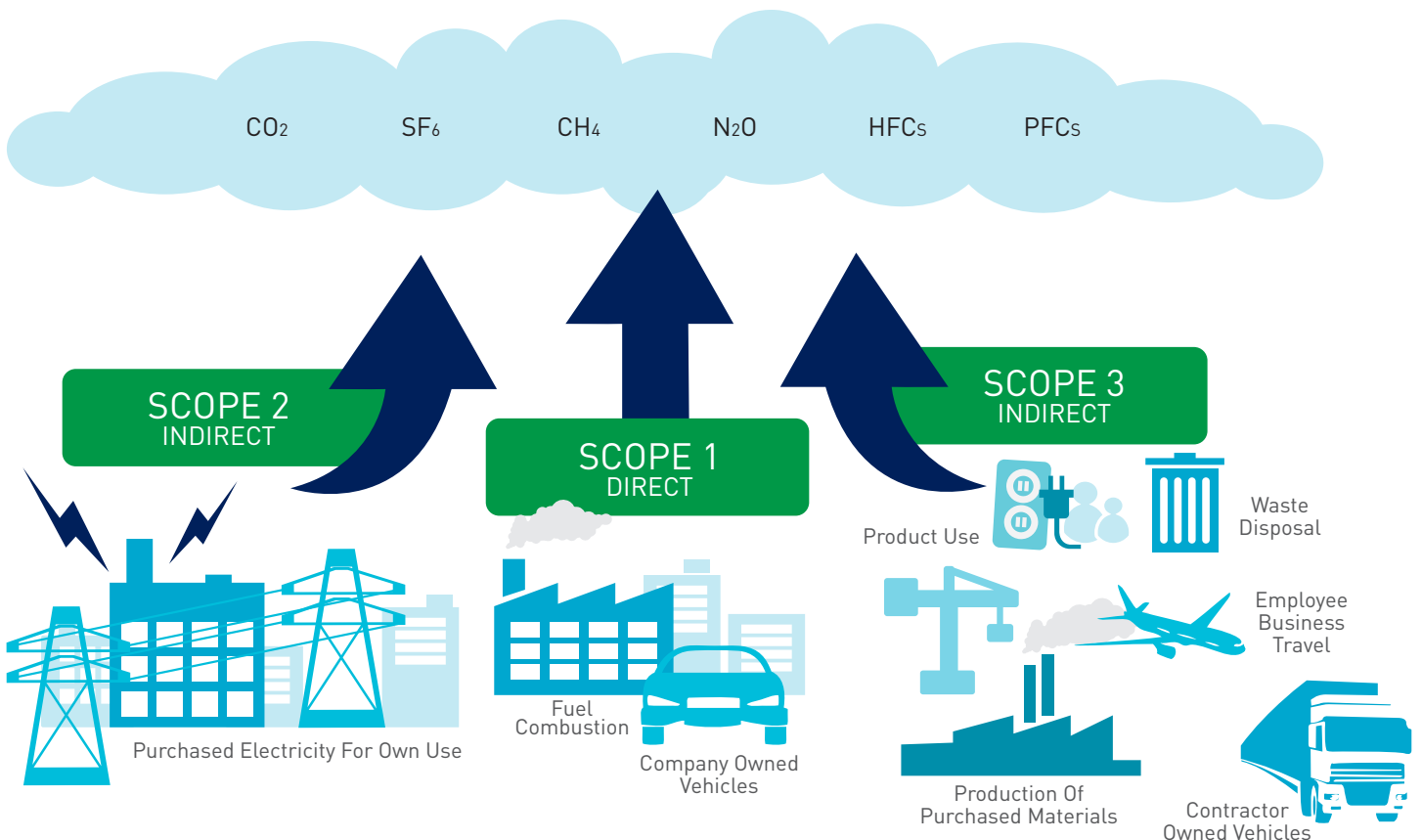
As the effects of climate change become more pronounced, governments, corporations and individuals are becoming more concerned with their own contributions to climate change. Many are actively engaging in discussions on managing climate change and measuring their “carbon footprint”, or greenhouse gas (GHG) emissions resulting from products or activities, to identify strategies to reduce their climate impacts.

The GHG Protocol is the accounting tool used by companies around the world to understand, quantify and manage GHG emissions. It provides standards and guidance in preparing a GHG emissions inventory and is classified into three “scopes”, based on their sources:

- **Scope 1** emissions include direct GHG emissions from sources that are owned or controlled by the entity. For example, emissions from fossil fuels burned on-site, and emissions from entity-owned or entity-leased vehicles are included in Scope 1.
- **Scope 2** emissions include indirect GHG emissions from the generation of purchased electricity, heating and cooling, or steam generated off-site. In addition, the transmission and distribution (T&D) losses associated with certain purchased utilities are included in calculating Scope 2 emissions.
- **Scope 3** emissions are indirect GHG emissions from sources not owned or directly controlled by the entity, but related to the entity’s activities. For example, employee travel and commuting,

T&D losses associated with purchased electricity, contracted solid waste disposal, contracted wastewater treatment, leased space, vendor supply chains, and use of sold products are sources of Scope 3 emissions.

Understanding a company’s GHG emissions is the first step for an effective corporate climate change strategy. Companies have been, and continue to be, focused on Scope 1 and Scope 2 of the GHG Protocol. Increasingly, companies understand the need to account for GHG emissions along their value chains as well as their portfolios. Preparing a GHG inventory which includes Scope 3 emissions results in creating competitive advantage by enabling better product design, increasing efficiencies, reducing costs and mitigating risks.



Source: Diagram from Bahtia and Ranganathan, 2004, Scope 1, Scope 2 and Scope 3 emissions

## EVALUATING DIFFERENT SCOPE 3 STANDARDS

The Corporate Value Chain (Scope 3) Accounting and Reporting Standard is a supplement to the GHG Protocol Corporate Accounting and Reporting Standard, and should be used in conjunction with it.

There are fifteen categories in the GHG Protocol Scope 3 standard, including business activities common to many organizations. These categories allow companies to identify the major areas of impact from the full course of business operations and include employee activities. One group of categories focuses on the goods and services a company and its employees consume in the process of doing business:

1. Purchased goods and services
2. Capital goods
3. Fuel- and energy-related activities
4. Upstream transportation and distribution
5. Waste generated in operations
6. Business travel
7. Employee commuting
8. Upstream leased assets

The other group focuses on the downstream life cycle GHG emissions of goods and services that a company produces.

These categories allow companies to focus on the areas of impact related to their specific products, but don't require taking the assessments to the unit level of a product:

9. Downstream transportation and distribution
10. Processing of sold products
11. Use of sold products
12. End-of-life treatment of sold products
13. Downstream leased assets
14. Franchises
15. Investments

**“THERE ARE FIFTEEN CATEGORIES IN THE GHG PROTOCOL SCOPE 3 STANDARD, INCLUDING BUSINESS ACTIVITIES COMMON TO MANY ORGANIZATIONS.”**

Both categories are related to the GHG Protocol Standard for Product Life Cycle Accounting and Reporting.

The Product Standard is used to understand the full life cycle emissions of a product and to focus efforts on the greatest GHG emissions reduction opportunities. This is the first step towards creating more sustainable products. Using this standard, companies measure the GHG emissions associated with the full life cycle of products, including raw materials, extraction and manufacturing, transportation, storage, and use and disposal of products, which enables them to manage the corresponding GHG risks and opportunities. The standard will also help companies respond to customer demand for environmental information.

Developed simultaneously, the GHG Protocol Scope 3 Standard and GHG Protocol Product Standard take a value chain or life cycle approach to GHG accounting. The Scope 3 Standard accounts for upstream and downstream life cycle GHG emissions at the corporate level, while the Product Standard accounts for them at the individual product level. Together with the Corporate Standard, the three standards provide a comprehensive approach to value chain GHG measurement and management.

For many business sectors, with the exception of sectors with apparent large amounts of GHG emissions like power generation and transportation suppliers, carbon footprints from direct emissions and purchased energy use have been shown to often be a smaller portion of the total carbon footprint of a company or its products. According to the American Chemical Society, previous estimates have indicated that, on average, Scope 1 emissions from an industry are only 14% of the total upstream supply chain carbon emissions, and the sum of emissions from Scope 1 and Scope 2, on average, are only 26% of total upstream supply chain emissions, leaving a significant portion of the upstream supply chain emissions in the non-mandatory Scope 3 category. Furthermore, this does not even consider downstream carbon emissions.

Although Scope 3 emissions are clearly important, measuring them is highly time-consuming and resource-intensive. Currently, companies voluntarily disclose Scope 3 emissions, as they are not required under any specific regulatory requirement. As a result, only proactive companies tend to collect, analyze and report Scope 3 carbon emissions, leaving significant opportunities for carbon reductions not being fully realized. As the costs for mitigating GHG emissions are gradually internalized, this also means missed opportunities for avoiding potential future cost increases in the supply chain.

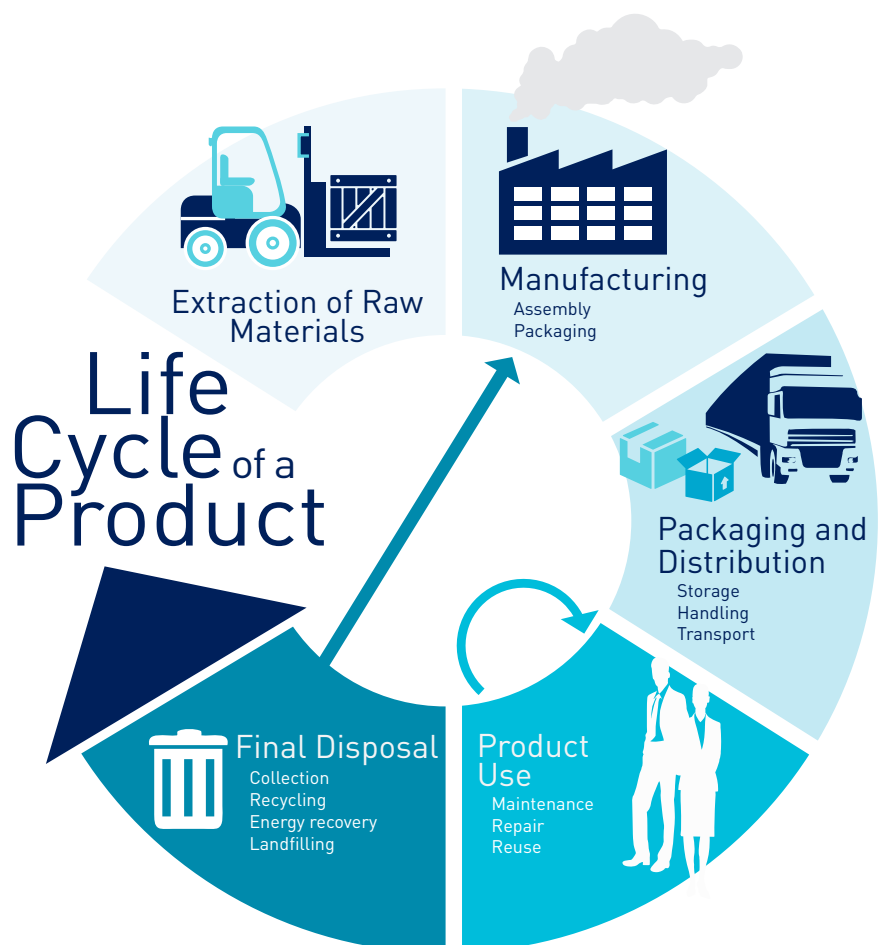
Both GHG Protocol Standards allow the use of primary and secondary data sources for Scope 3 emissions. Primary data refers to supplier-specific GHG emissions data; secondary data are from other sources such as industry average data, process life cycle inventory data, and industry association data.

Another international standard for scope 3 GHG emissions evaluation is ISO/TS 14067:2013, "Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification and communication". This standard lays out principles, requirements and guidelines for the quantification and communication of a product's carbon footprint following International Standards on life cycle assessment, eco-labels, and communication including ISO 14040, ISO 14044, ISO 14020, ISO 14024, and ISO 14025. ISO/TS 14067:2013 is generally in-line with the GHG protocol's product standard, while also strictly adhering to the ISO 14040 and ISO 14044 for Scope 3 quantification. For organizational-level assessment, ISO/TS 14072:2014, "Requirements and guidelines for organizational life cycle assessment", is applicable, and its coverage is not strictly specific to GHG emissions.

Quantification of supply chain emissions in ISO/TC 14072:2014 also follows ISO 14040 and ISO 14044. ISO standards do not list a set of Scope 3 categories as GHG protocols do.

Companies can use these standards for:

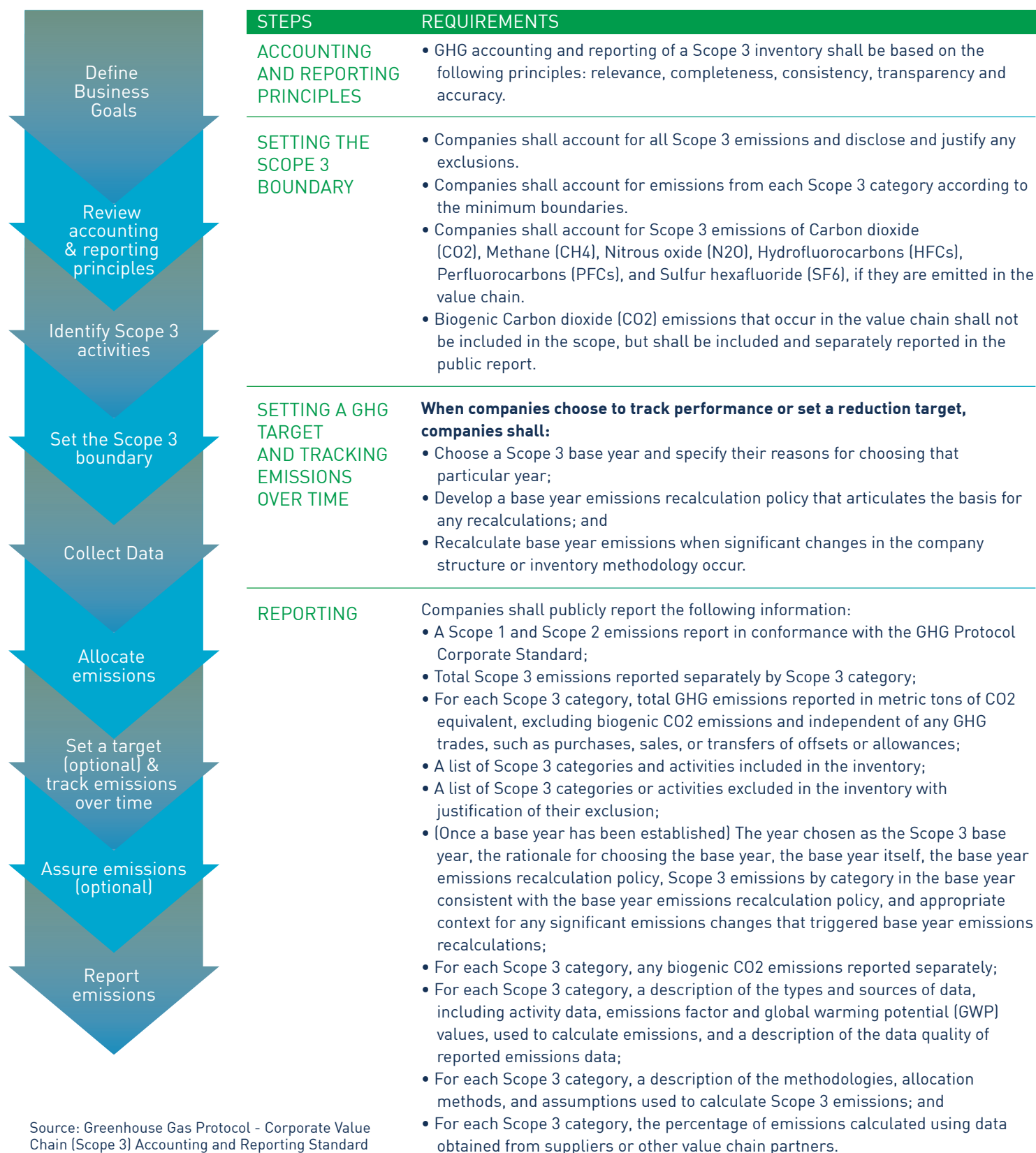
- Identifying the risks and opportunities associated with GHG emissions through upstream and downstream supply chain
- Setting reduction targets and tracking performance
- Engaging suppliers and other value chain partners in GHG management and sustainability
- Enhancing stakeholder information and corporate reputation through public reporting.



Source: Life Cycle of a Product – Ciraig.org

## STEPS AND REQUIREMENTS IN PREPARING A SCOPE 3 INVENTORY

The figure below provides an overview of the steps in Scope 3 accounting and reporting a company should follow when developing a Scope 3 inventory. The steps are described in detail in the table on the right.



Source: Greenhouse Gas Protocol - Corporate Value Chain (Scope 3) Accounting and Reporting Standard

## WHICH METHODS TO USE

The most common question raised by those looking to report in line with the Scope 3 Standard is, “Where do we start?” The standard’s 15 Scope 3 categories add a necessary level of complexity, but this is quickly resolved with the help of tools that prioritize categories of emissions that are most significant.

The first step in corporate GHG accounting is to identify which operations are included in the company’s organizational boundary and its emissions.

Based on the Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard, the table below identifies the minimum boundaries of each Scope 3 category, helping companies understand which activities should be accounted for and ensure that major activities are included in the Scope 3 inventory.

CATEGORY	MINIMUM BOUNDARY							Scope 1 and Scope 2 emissions	Optional
	Extraction of Raw Materials	Agricultural activities	Manufacturing, production and processing	Generation of electricity consumed by upstream activities	Disposal/Treatment of waste generated by upstream activities	Land use and land use change	Transportation of materials and products between suppliers		
1. Purchased goods and services									
2. Capital goods									
3. Fuel- and energy-related activities (not included in Scope 1 and Scope 2)									
4. Upstream transportation and distribution								Scope 1 and Scope 2 emissions of transportation and distribution providers that occur during use of vehicle and facilities	The life cycle emissions associated with manufacturing vehicles, facilities, or infrastructure
5. Waste generated in operations								Scope 1 and Scope 2 emissions of waste management suppliers that occur during disposal or treatment	Emissions from transportation of waste
6. Business travel								Scope 1 and Scope 2 emissions of transportation carriers that occur during use of vehicles	The life cycle emissions associated with manufacturing vehicles or infrastructure
7. Employee commuting								Scope 1 and Scope 2 emissions of employees and transportation providers that occur during use of vehicles	Emissions from employee teleworking
8. Upstream leased assets								Scope 1 and Scope 2 emissions of lessors that occur during the reporting company’s operation of leased assets	The life cycle emissions associated with manufacturing or construction of leased assets
9. Downstream transportation and distribution								Scope 1 and Scope 2 emissions of transportation providers, distributors, and retailers that occur during use of vehicles and facilities	The life cycle emissions associated with manufacturing vehicles, facilities, or infrastructure
10. Processing of sold products								Scope 1 and Scope 2 emissions of downstream companies that occur during processing	
11. Use of sold products								The direct use-phase emissions of sold products over their expected lifetime, i.e., the Scope 1 and Scope 2 emissions of end users that occur from the use of: products that directly consume energy (fuels or electricity) during use; fuels and feedstocks; and GHGs and products that contain or form GHGs that are emitted during use	The indirect use-phase emissions of sold products over their expected lifetime, i.e., emissions from the use of products that indirectly consume energy (fuels or electricity) during use
12. End-of-life treatment of sold products								Scope 1 and Scope 2 emissions of waste management companies that occur during disposal or treatment of sold products	
13. Downstream leased assets								Scope 1 and Scope 2 emissions of lessees that occur during operation of leased assets	The life cycle emissions associated with manufacturing or constructing leased assets
14. Franchises								Scope 1 and Scope 2 emissions of franchisees that occur during operation of franchises	The life cycle emissions associated with manufacturing or constructing franchises
15. Investments								Category 15 is designed primarily for private financial institutions (e.g., commercial banks), but is also relevant to public financial institutions and other entities with investments not included in Scope 1 and Scope 2. A reporting company’s Scope 3 emissions from investments are the Scope 1 and Scope 2 emissions of investees.	

Source: Greenhouse Gas Protocol - Corporate Value Chain (Scope 3) Accounting and Reporting Standard

## CALCULATING EMISSIONS IS A MULTI-STEP PROCESS

GHG Protocol provides calculation tools that allow companies to develop a broad and trustworthy inventory of their GHG emissions:

- Cross Sector Tools: Applicable to many industries and businesses regardless of sector
- Sector Specific Tools: Principally designed for specific sectors or industries, though they may be applicable to other situations
- Additional Guidance Documents: Provide further clarification on quantification and reporting issues
- Customized Calculation Tools: Customized for particular countries such as China and Mexico

The calculation tools are electronic spreadsheets with accompanying step-by-step guidance documents. A guidance document includes:

- An overview of the protocol with information on the sector, sources and process(es) that it covers
- One or more approaches for determining CO<sub>2</sub> and other GHG emissions, e.g., direct measurement, mass balance, etc.
- Guidance on collecting activity data and selecting appropriate emissions factors
- Likely emissions sources and the scopes they fall under (specific to a particular sector)
- Additional information, such as quality control practices and program specific information

The spreadsheets help carry out any necessary emissions calculations. These tools were developed in partnership with industry experts and represent best practice quantification methodologies. The calculation tools are available on the GHG Protocol website ([www.ghgprotocol.org/calculation-tools/all-tools](http://www.ghgprotocol.org/calculation-tools/all-tools)) and are meant to complement the Protocol and make calculations easier, but their use is not mandatory. Most of these free tools listed under the WRI web site are, however, designed to address Scope 1 and Scope 2 emissions. WRI recently published a new tool, Scope 3 Evaluator, that aims to provide a rough estimate on Scope 3 emissions based on generic GHG emissions per dollar of spend data derived from a highly aggregated input-output table. The Scope 3 Evaluator offers an excellent first step for companies to familiarize themselves with Scope 3 estimations. Companies that intend to report Scope 3 estimates to a third party or plan to use results for corporate decision-making benefit from the use of professional services or tools that are designed to meet the quality standards necessary for the intended purposes.

The Environmental Protection Agency (EPA) also provides a calculation tool. The EPA Simplified GHG Emissions Calculator (SGEC) is designed to develop an annual GHG inventory based on the EPA Climate Leaders Greenhouse Gas Inventory Protocol. This tool can be used to develop a baseline GHG inventory at any level of a community (i.e., facility, campus, city) and to track emissions annually thereafter. The calculator includes emissions from Scope 1 (stationary combustion, mobile combustion, refrigerants, fire suppression equipment and waste), Scope 2 (purchased electricity and steam), and Scope 3 (employee business travel and commuting, and product transport) sources. The calculation tools are available on the EPA website ([www.epa.gov/climateleadership/smallbiz/footprint.html](http://www.epa.gov/climateleadership/smallbiz/footprint.html)).

“COMPANIES THAT INTEND TO REPORT SCOPE 3 ESTIMATES TO A THIRD PARTY OR PLAN TO USE RESULTS FOR CORPORATE DECISION-MAKING BENEFIT FROM THE USE OF PROFESSIONAL SERVICES OR TOOLS THAT ARE DESIGNED TO MEET THE QUALITY STANDARDS NECESSARY FOR THE INTENDED PURPOSES.”

A very specific tool developed by Compass Group offers a unique, easy-to-use, web-based application that allows food service managers to create strategies to reduce their kitchen operations' carbon footprints. The metrics section of the application, designed by ADEC Innovations and hosted as part of its Sustainability Workbench platform, helps food service managers track and analyze data on energy use, water use, carbon and solid wastes so they can identify opportunities to decrease their usage on all fronts. Scope 3 GHG tracking is an integral part of the Carbon FOODprint toolkit.

As part of the design and collaboration with Compass Group, ADEC collected thousands of pieces of data on the production, packaging and transport of individually purchased food items, serving materials and cleaning chemicals required to manage a foodservice operation “from cradle to customer.” The Toolkit couples this information with site-specific operational data from individual cafes to provide up-to-date dashboards on the carbon, energy, water and wastes associated with all aspects of a food service operation (facilities, kitchen operations, kitchen services and menu engineering). Foodservice managers can make up to 185 strategic choices in four key areas, including menu engineering, kitchen services, site equipment and facilities.

ADEC also offers an end-to-end Scope 3 GHG emissions calculation and reporting solution, VitalMetrics CDP, a turnkey Software-as-a-Service (SaaS) platform designed to address all Scope 3 needs for CDP reporting including calculation (14.1), third-party verification and assurance (14.2), previous year comparison (14.3) and supplier engagement (14.4). It employs smart algorithms and data from over 160 countries to identify the most efficient pathway to calculate each of the 15 GHG Protocol categories with minimum data collection effort, while maintaining credibility in the results.



## COMPANIES THAT CURRENTLY REPORT SCOPE 3 EMISSIONS

According to the ET Global 800 Carbon Ranking Report developed by the Environmental Investment Organisation (EIO), out of the 800 companies examined in the report, 267 of them, or 33%, report one or more Scope 3 emissions source categories. As for those that report more Scope 3 categories, only 15 companies, or a mere 2%, do so. The report covers the GHG emissions and transparency of the world's largest 800 companies.

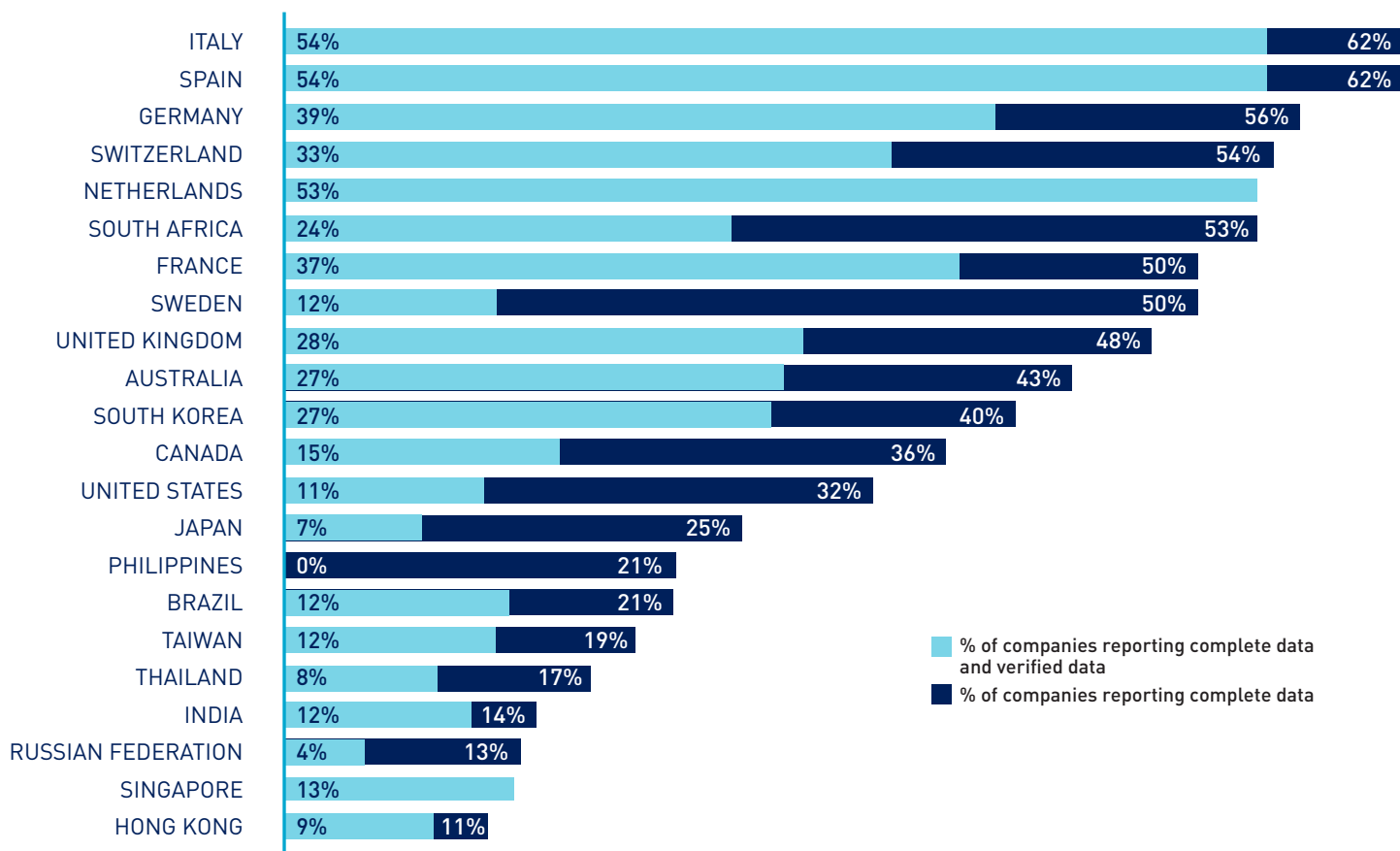
COMPANY NAME	NO. OF SCOPE 3 CATEGORIES REPORTED
BASF	15
Baxter Intl	12
Legrand	10
UPS	10
General Motors	6
Sprint Nextel	5
Google	5
Nokia	5
Ericsson	4

Source: EIO (Environmental Investment Organisation)

“THE REPORT COVERS THE GHG EMISSIONS AND TRANSPARENCY OF THE WORLD'S LARGEST 800 COMPANIES.”

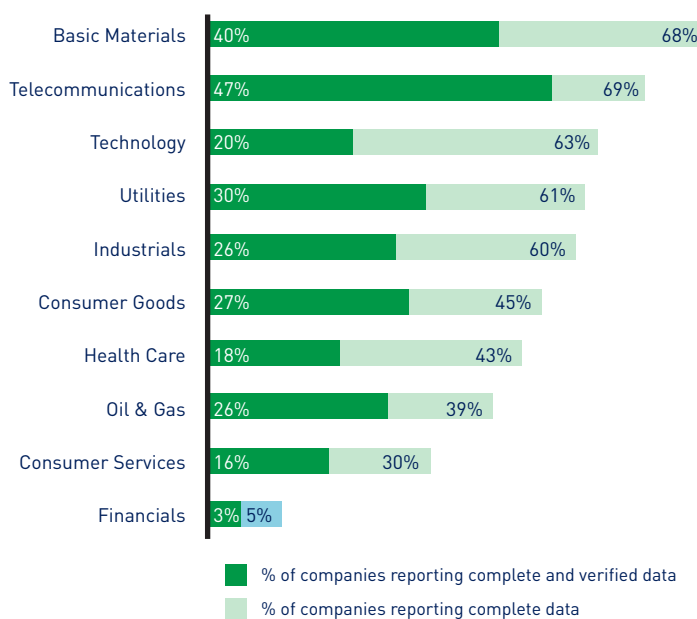


Europe leads the world on all disclosure metrics: 35% of companies report complete and independently verified data. Italy and Spain are keys to Europe’s success, with 62% of companies reporting complete data, and 54% having their data verified.



The complete report is available on the EIO website ([www.eio.org.uk/pdf/2013\\_Carbon\\_Ranking\\_Report\\_Global\\_800\\_final\\_draft.pdf](http://www.eio.org.uk/pdf/2013_Carbon_Ranking_Report_Global_800_final_draft.pdf)).

Although significant action has been taken in the past twenty years, companies still have a long way to go. With large differences between regions, developed and developing countries, and companies, there is vast room for improvement, innovation and collaboration. In order to improve, companies should first know where they are, which is why monitoring of and (complete) reporting on GHG emissions is crucial to taking the next steps.



Source: ET Global 800 Carbon Ranking Report

## THE IMPORTANCE OF REPORTING SCOPE 3 EMISSIONS

For many companies, governments and institutions, suppliers are responsible for the majority of their carbon footprints. Managing carbon in supply chains is therefore vital to developing more sustainable business models and brands. Furthermore, companies that measure and reduce supply chain emissions can use low-carbon credentials to attract customers and improve access to capital.

Business intelligence on energy use and emissions embedded in supply chains can be used to improve efficiency and risk management, revealing opportunities to gain a competitive advantage. Companies are also starting to measure carbon in supply chains to strengthen sustainability, supply chain management and brand value.

According to Proceedings of the National Academy of Sciences of the United States of America (PNAS), emissions from international trade have increased by more than 80% since 1990. Emissions from supply chains are a significant part of this increase.

Extending carbon management to procurement helps uncover resource and process inefficiencies that deliver cost savings, or help protect cash flows from increasing input costs. Organizations use findings from measuring carbon in supply chains to prepare for low-carbon opportunities by managing

risks from increasing energy costs and carbon restrictions. Measuring, reporting and reducing carbon emissions from operations and critical suppliers reduce the cost of capital. Forward-thinking organizations are including measures to address supply chain carbon in climate change strategies. Working with critical suppliers to cut emissions helps strengthen supply chain management and brands.

In 2013, CDP had more than 60 member companies working with their suppliers on reducing emissions and mitigating climate change, including Walmart, Unilever, The Coca-Cola Company, Cisco Systems, PepsiCo Inc., Dell, Inc., and L'Oreal SA. (Source: [www.cdproject.net/en-us/programmes/pages/cdp-supply-chain.aspx#members](http://www.cdproject.net/en-us/programmes/pages/cdp-supply-chain.aspx#members)) Managing carbon is a key ingredient for a successful business. It's not only good for the environment, but it's also a way to save money, cut risks and create exciting new business opportunities.

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ADEC INNOVATIONS IS AVAILABLE TO ASSIST COMPANIES IN REDUCING THEIR CARBON FOOTPRINT BY IMPROVING CARBON MONITORING AND REDUCTION PROGRAMS THROUGH SERVICES LIKE:

- CARBON INVENTORY AND VERIFICATION
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