



Reimagining Greenhouse Gas Disclosures

How New Carbon Accounting Principles Can Drive
Emissions Reductions in Supply Chains



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About RMI

RMI is an independent nonprofit founded in 1982 that transforms global energy systems through market-driven solutions to align with a 1.5°C future and secure a clean, prosperous, zero-carbon future for all. We work in the world’s most critical geographies and engage businesses, policymakers, communities, and NGOs to identify and scale energy system interventions that will cut greenhouse gas emissions at least 50 percent by 2030. RMI has offices in Basalt and Boulder, Colorado; New York City; Oakland, California; Washington, D.C.; and Beijing.



About COMET

The Coalition on Materials Emissions Transparency (COMET)—a partnership between RMI, Columbia University Center for Sustainable Investment, and the Payne Institute for Public Policy at the Colorado School of Mines—is working to reimagine what GHG disclosure looks like. COMET’s goal is to ensure that disclosure from companies drives emissions reductions.

Executive Summary

As more and more companies make net-zero commitments, it is important to focus on impact. Making progress toward ambitious goals requires a system for clearly measuring emissions reductions. Anyone familiar with current carbon accounting frameworks for corporate environmental, social, and governance (ESG) reporting knows it is notoriously difficult to quantify greenhouse gas (GHG) emissions and demonstrate that meaningful change is occurring. When it comes to determining and disclosing a GHG footprint, companies and analysts still must navigate several choices, despite broad acceptance of GHG Protocol guidance.

Many emissions disclosures focus only on the company level, and it is rare that a company reports the impacts of individual assets or products. (See *Emissions Reporting Levels*, page 5.) The key barrier to asset- and product-level reporting is that a company does not have sufficient information to understand its supply chain emissions. As a result, a company's procurement decisions are disconnected from emissions reductions. What's more, despite a clear demand for low-carbon products and a willingness on the part of consumers to pay for them,¹ low carbon is still poorly defined.

The Coalition on Materials Emissions Transparency (COMET)—a partnership between RMI, Columbia University Center for Sustainable Investment, and the Payne Institute for Public Policy at the Colorado School of Mines—is working to reimagine what GHG disclosure looks like. COMET's goal is to ensure that disclosure from companies drives emissions reductions. An ability to understand supply chain emissions at the product level is essential for the change COMET envisions.

This paper focuses on the changes COMET is proposing to the principles of carbon accounting to enable these outcomes. The proposed changes build from the GHG Protocol, are compatible with the current ecosystem of reporting, and focus on product-level disclosure. The recommendations stem from improved product-level data and the ability to connect that information to the corporate level.

Exhibit 1

The three proposed changes to the principles of carbon accounting for corporations

1. Use primary data: Focus on product-level information from direct suppliers

2. Create bounds for comparison: Use fixed boundary reporting to understand supply chain emissions and enable comparability

3. Define measurement made for markets: Ensure that incentives for reporting drive direct decarbonization

Understanding Supply Chain Emissions at the Product Level Is Key

Fundamentally, accurately calculating GHG footprints is a supply chain issue—every company in a supply chain is somewhat responsible for what happens during the production of the goods and services it sells. For direct emissions at the asset level, assigning corporate-level responsibility for the emissions is straightforward: the company that owns the asset is responsible for its emissions. For indirect supply chain emissions, which the GHG Protocol refers to as Scope 3, it is much more difficult to account for emissions because the reporting company has to estimate emissions for the other companies in its supply chain.

To address this challenge, the focus of carbon accounting needs to shift from estimating the emissions of other *companies* in a supply chain to having a clear, near-real-time view of *product-level* emissions in a supply chain. In other words, while it's essential for companies to report Scope 3 emissions at a corporate level, these disclosures should be based on product-level information, which in turn can drive procurement decisions that ultimately reduce emissions.

To realize this, a more consistent exchange of information across corporate boundaries is needed, similar to how information already moves across corporate boundaries at the product level, whether as a bill of lading at a port or a barcode on a shelf, for example. Using data from manufacturing plants (at the asset level) to develop clear product-level disclosure should be the building block for carbon accounting at any level. In addition, by determining what constitutes a low-carbon product, the accounting system can provide an incentive for a company to make lower-carbon products, which may command a price premium.

Emissions Reporting Levels

Asset level: emissions from manufacturing plants or industrial sites (where most primary data about emissions is measured and sourced)

Product level: emissions of a specific product coming out of an asset (calculation of product-level emissions requires a portion of the asset-level emissions be allocated to the product)

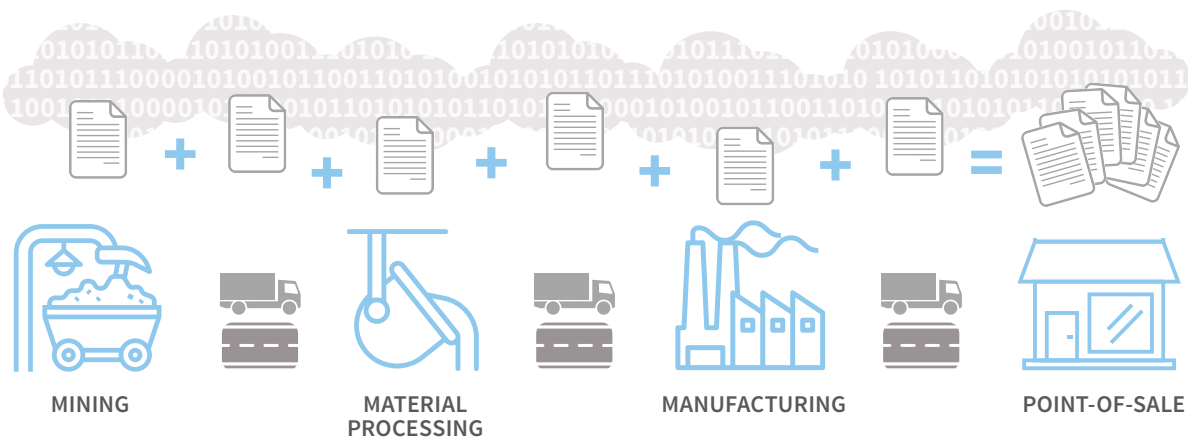
Corporate level: emissions from any number of assets, as well as broader operational emissions (e.g., transportation)

National level: emissions of a collection of assets, carbon sinks, and operations within a geographic boundary (important for tracking progress against nationally determined contributions [NDCs] in the Paris Climate Agreement)

Exhibit 2

Collection of emissions information across corporate boundaries

As materials travel from one place to another on the way to becoming a final product, COMET's goal is for emissions information to travel along as well.



Use Primary Data

The GHG Protocol, a long-standing cornerstone of carbon accounting, has been a useful tool in making the case for a company's shared responsibility for the emissions in its supply chain. The logic is straightforward: companies should report on both direct emissions and indirect emissions caused as a result of their operations. But this approach has not been effective in spurring widespread decarbonization because, among other reasons, emissions "hot spots" are often deep in the supply chain, many tiers of suppliers away from consumer-facing manufacturers that are trying to decarbonize.

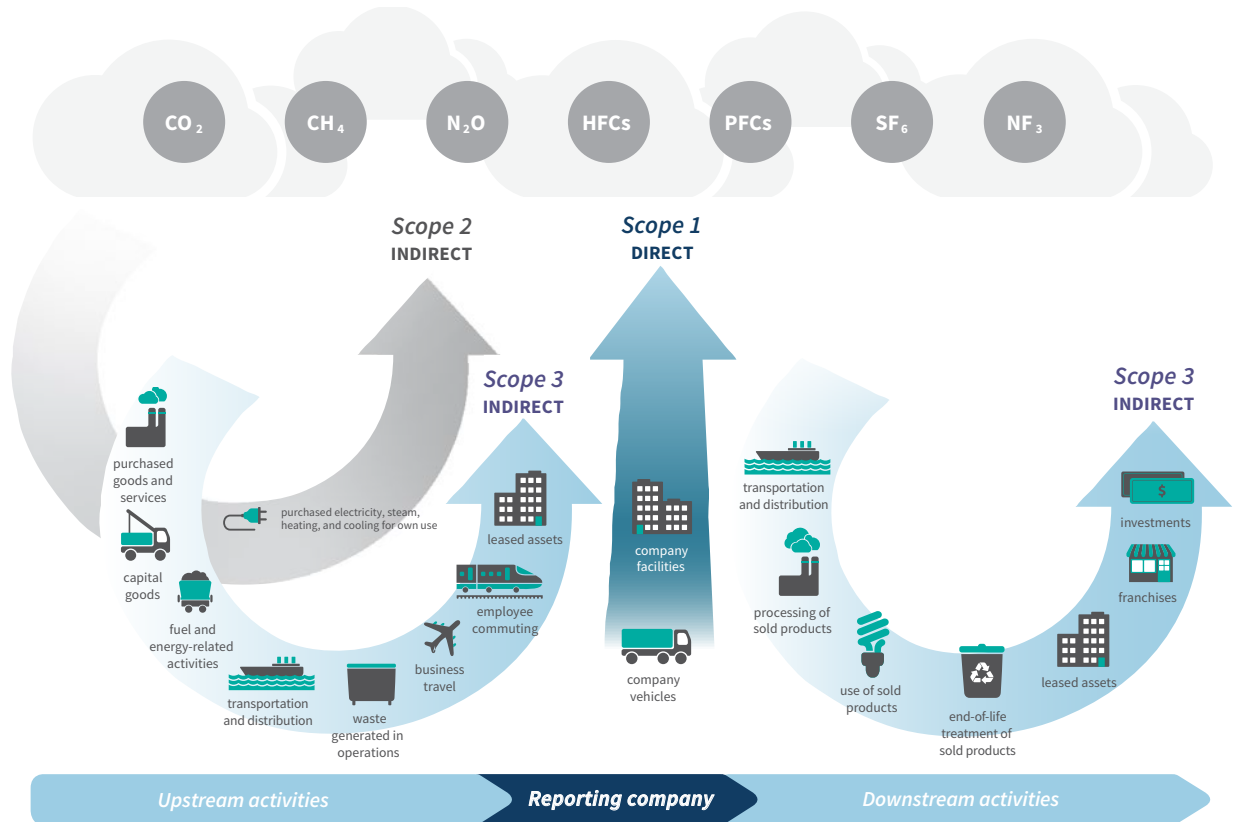
The GHG Protocol's Scope 3 guidance has 15 categories to report against, as shown in Exhibit 3, next page. Companies spend countless hours attempting to identify emissions data for these categories. Companies rarely have relationships outside of their direct suppliers and customers, making the collection of primary data in multitier supply chains challenging.

To fill the gaps, many companies turn to life-cycle inventory databases. These databases provide average emissions estimates for many commonly used products and services. For downstream emissions, companies must further make assumptions about how their products will be processed or used. In some cases, companies will omit categories of Scope 3 reporting altogether, citing data sourcing difficulties, which further reduces the usefulness of disclosures. The myriad choices in compiling Scope 3 emissions estimates provide opportunities for bias and manipulation, which can lead to greenwashing.

Clearly, companies have opportunities through procurement and other tools to reduce their supply chain emissions. However, current emissions accounting methods don't provide information useful for driving procurement decisions to lower supply chain emissions. The key to solving these problems is to have Scope 3 emissions based on primary data instead of averages and assumptions. Using more primary data is widely accepted as desirable. Reporting frameworks (notably WBSCD's Pathfinder) emphasize this by requiring disclosure of the amount of primary data used.² To increase the amount of primary data, companies should focus on what is actionable: getting primary data from direct suppliers and providing quality data to customers. If every member of a supply chain did this, a product's carbon footprint could be based entirely on primary data, and the accuracy of corporate-level reporting would also improve.

Exhibit 3

Overview of GHG Protocol scopes and emissions across the value chain



Source: GHG Protocol, *Technical Guidance for Calculating Scope 3 Emissions (version 1.0)*, https://www.ghgprotocol.org/sites/default/files/ghgp/standards/Scope3_Calculation_Guidance_0.pdf

Currently, each company independently calculates emissions across its entire supply chain, which is inefficient because it results in duplicative efforts, with multiple companies determining emissions from the same supply chain participants. By contrast, as each participant in a supply chain provides primary emissions data and passes it to the next participant, actual emissions data would accumulate and be accessible to multiple companies. New technologies (such as distributed ledger technology, specifically blockchain) can help to facilitate the flow of this information and may eventually provide a platform for information to flow in the opposite direction (i.e., helping to define downstream emissions).

The approach of building up emissions information along a supply chain would not only make it easier for companies to calculate emissions, but it would also open new opportunities to reduce emissions. For example, currently a company using an average emissions factor for a purchased good in its Scope 3 estimate can reduce these emissions only by using less of the product. But when the product's emissions information is based on primary data and available at the time of purchase, the company can work with (or switch) suppliers to reduce emissions. In this way, a company can make decisions that will reduce supply chain emissions and offer a more environmentally friendly product to customers.

Create Bounds for Comparison

The GHG Protocol was designed for completeness, allowing companies to cover all the bases, once a year. This does not fit the emerging need for corporations to know how their emissions change as procurement decisions and products change. The shift from trying to quantify emissions from an entire supply chain to focusing on direct suppliers will make emissions data more actionable; however, more information is needed in order to meaningfully compare products and materials. Companies are currently left to their own devices to decide which categories of Scope 3 they report against, which prevents this comparison.

The GHG Protocol itself states that its *Corporate Value Chain (Scope 3) Standard* “is not designed to support comparisons between companies based on their Scope 3 emissions.”³³ (In line with the changes proposed in this paper, COMET will release sector-specific guidance on how to allocate emissions from asset to product, enabling comparison between companies and products based on their GHG footprints.)

Companies should report emissions against a fixed boundary based on all the processes it takes to make a product, not just the ones they own or operate within their corporate boundary. (See *The Difference Between a Corporate Boundary and a Fixed Boundary*, below.) Using a fixed boundary will include Scope 1 and 2 emissions, and determine which of the 15 categories of Scope 3 emissions a company must address. Filling in that fixed boundary using primary data as recommended in the section above will be straightforward. For other more challenging processes, emissions factors and data from life-cycle assessments can be used to fill in gaps if necessary.

Supply chain partners should collectively prioritize gathering primary data for hot spots where the emissions are largest or where they have the largest variability. If all the members of a supply chain are reporting against the same boundary, and all have a common interest to get primary data from where emissions are highest, it will be easier to represent most supply chain emissions with primary data.

The Difference Between a Corporate Boundary and a Fixed Boundary

A corporate boundary is set by the parts of a production process that a company owns. For example, a large, vertically integrated company has a large corporate boundary when it owns a mine, a smelter, and a manufacturing plant. A corporate boundary defines what emissions will be Scope 1 and 2, and what emissions are outside of that corporate boundary and should be considered Scope 3.

A fixed boundary is simpler: if a company is anywhere in the boundary, it is responsible for getting all of the emissions information for what is in the boundary (and the company can tally up its Scope 1, 2, and 3 emissions later). When other companies within (e.g., a direct customer) or outside of (e.g., an investor) the fixed boundary request information, they know what to expect because the boundary is fixed.

These new reporting practices will not be adopted overnight. Nor will sensors suddenly one day cover all measurement needs or life-cycle assessment databases become unneeded and gather dust. Nonetheless, a fixed boundary can direct data collection to where it is needed most—toward the sources of a majority of emissions, regardless of corporate boundary. Reaching across corporate boundaries to understand supply chain emissions enables comparison of emissions between products and companies, even in complex supply chains.

Define Measurement Made for Markets

The goals of better corporate ESG reporting are to better reward good behavior and drive decarbonization of complex supply chains. Reporting should be structured in a way that incentivizes decarbonization across sectors.

Currently, product-level reporting occurs through environmental product declarations (EPDs), which are defined by product category rules (PCRs). PCRs define key aspects like product boundaries, data sources, and rules that allow comparison. Most PCRs were developed in response to government requirements for product information (i.e., focused on a company's social license to operate) and therefore did not emphasize how emissions information can drive decarbonization in existing markets.

To achieve the right emissions reduction incentives, it is important that EPDs evolve toward using more asset-level primary data to make low-carbon product declarations. Consider the case of a company manufacturing construction products in both the United States and Europe. The facilities used in Europe may already have invested in lower emissions manufacturing due to the pricing incentive of the European Union's Emissions Trading System. The company could then issue an organization-wide EPD for the product based on an average of all EU- and US-based assets. This would give the impression that the product has a lower emissions footprint than is typical in the US market, allowing the company to maintain market share or realize a price premium in the United States without having made any additional decarbonization investments there. This example highlights how too broad of a product definition can curtail incentives to decarbonize.

Similarly, if product boundaries are defined too narrowly (such as for a specific car part), there may not be enough choice to allow purchasers to buy a lower-carbon version of that part. Therefore, it is necessary to define product boundaries with a view of the investments needed to decarbonize a sector. Doing so establishes a feedback loop between the investments made in reducing emissions and any premiums earned from selling low-carbon products. Such product boundary definitions are oftentimes sector-specific and will therefore need to be contained within sector-specific guidance.

Companies across the supply chain should engage with each other and with external stakeholders (such as nongovernmental organizations and regulators) to define low-carbon product markets. The benefits of defining these markets openly and collaboratively are clear: suppliers can ensure the market rewards them for investments made in lowering emissions, whereas purchasers can credibly tackle Scope 3 emissions and avoid any perception of greenwashing.

Conclusion

For companies to hit ambitious decarbonization targets, systems need to quickly be developed to make Scope 3 GHG emissions visible and traceable across supply chains, starting with the highest-emitting industrial sectors. Getting GHG disclosures right could accelerate the transition to zero-carbon production, and first movers will reap the benefits of taking action to meet the demands of an increasingly climate-conscious customer base.

Sustainability professionals can use the principles we have laid out in this paper to drive emissions reductions in the following ways:

- 1.** Focus on collecting primary data from direct suppliers and providing quality, product-level emissions information to customers.
- 2.** When reporting product-level emissions, use a fixed boundary for the supply chain to allow for comparisons. Focus efforts on ensuring that the highest emitting processes in the boundary are based on primary data.
- 3.** Engage with standards developers and certifying bodies to ensure that markets are formed that reward investments in decarbonization and use primary data in product disclosures.

The principles outlined above will serve as cornerstones for the development of the COMET Framework, in partnership with the United Nations Framework Convention on Climate Change. In a series of sector-specific guidance documents and supporting materials, the COMET Framework will:

- 1.** Allow for clear translation of emissions from asset, product, corporate, and national levels, including allocation guidance
- 2.** Provide sector-specific guidance for consistent calculation of Scope 1, 2, and 3 emissions in alignment with the GHG Protocol and existing sector guidance

These principles and the COMET Framework will not only improve corporate reporting and low-carbon product declarations, but the resulting advances in emissions data will also benefit a wide range of stakeholders. Improvements to the descriptive aspect of climate data can help improve efforts to track prescriptive progress, such as those from RMI's Center for Climate-Aligned Finance or the Science Based Targets initiative.

Continual improvements to the targets and reporting of nationally determined contributions under the Paris Agreement will remain a core aspect of the fight against climate change. Expansion of these principles beyond GHG emissions to capture data related to labor as well as water and land use will be crucial to building an equitable, sustainable energy future.

COMET's goal is to ensure that there is a robust market for low-carbon goods that reports emissions in a way that is consistent and verifiable, is aligned with the metrics laid out by the recently formed International Sustainability Standards Board, and that incentivizes industrial decarbonization at the pace needed to meet the goals of the Paris Agreement. The changes outlined in this paper are a first step in reaching that goal.

Endnotes

1. “World’s Largest Steel and Concrete Buyers Make Game-Changing Push for Greener Solutions,” United Nations Industrial Development Organization, November 9, 2021, <https://www.unido.org/news/worlds-largest-steel-and-concrete-buyers-make-game-changing-push-greener-solutions>; and *Net-Zero Challenge: The Supply Chain Opportunity*, World Economic Forum in collaboration with Boston Consulting Group, January 2021, https://www3.weforum.org/docs/WEF_Net_Zero_Challenge_The_Supply_Chain_Opportunity_2021.pdf.
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3. “FAQ,” Greenhouse Gas Protocol, accessed December 2, 2021, https://ghgprotocol.org/sites/default/files/standards_supporting/FAQ.pdf.