



Template for submitting proposals related to GHG Protocol's *Corporate Standard, Scope 2 Guidance, Scope 3 Standard, Scope 3 Calculation Guidance* and market-based accounting approaches

(Optional)

Proposal instructions

GHG Protocol is conducting four related surveys in reference to the following GHG Protocol standards, guidance and topics:

1. Corporate Accounting and Reporting Standard (Revised Edition, 2004) ("Corporate Standard")
2. Scope 2 Guidance (2015)
3. Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011) ("Scope 3 Standard"), and Technical Guidance for Calculating Scope 3 Emissions, version 1.0, 2013 ("Scope 3 Calculation Guidance")
4. Market-based accounting approaches

The survey is open until March 14, 2023. To fill out the survey, [click here](#).

As part of the survey process, respondents may provide proposals for potential updates, amendments, or additional guidance to the *Corporate Standard, Scope 2 Guidance, Scope 3 Standard, or Scope 3 Calculation Guidance*, by providing the information requested in this template. You may also use this template to provide justification for maintaining a current approach on a given topic.

Submitting proposals is optional. Respondents may submit multiple proposals related to different topics.

Proposals should be as concise as possible while providing the requested information. Submissions that are outside of the template may not be considered. Proposals may be made publicly available.

To submit the proposal, please save this file and fill out the fields below. When you've completed your proposal, please upload the file via this [online folder](#). Please name your file STANDARD_Proposal_AFFILIATION, e.g., *Scope 2_Proposal_WRI*.

Respondent information

Name

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Organization

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If proposals are made publicly available, would you like your proposal to be made publicly available? Please write either "Yes" (make publicly available) or "No" (do not make publicly available).

Yes

If your proposal is made publicly available, would you like it to be made publicly available with attribution (with your name and organization provided) or anonymous (without any name or organization provided)? Please write either "With attribution" or "Anonymous".

With attribution

Proposal and supporting information

- 1. Which standard or guidance does the proposal relate to (Corporate Standard, Scope 2 Guidance, Scope 3 Standard, Scope 3 Calculation Guidance, general/cross-cutting, market-based accounting approaches, or other)? If other, please specify.**

General/cross-cutting across Scope 3 standards and guidance, with implications for Scope 1 measurement and for the redundancy of Scope 2.

2. What is the GHG accounting and reporting topic the proposal seeks to address?

The measurement of and accounting for GHG emissions in corporate supply chains.

3. What is the potential problem(s) or limitation(s) of the current standard or guidance which necessitates this proposal?

Our comments focus on the accounting foundations for reporting corporate GHG emissions, in particular, the classification of GHG emissions into three ‘Scopes’ within the GHG Protocol standards.

We endorse the GHG Protocol’s Scope 1 category of own-company emissions as a rigorous and measurable concept. Scope 1 emissions constitute the core emissions metric because the quantity of anthropogenic GHG added to the atmosphere in any given year equals the sum of all Scope 1 emissions, added up across all carbon emitting entities. We enthusiastically support an emphasis on accurate measurement and full disclosure of Scope 1 emissions. As we elaborate further below, accurate measurement of Scope 1 emissions is foundational for full and accurate accounting of a company’s supply-chain emissions.

The Scope 3 category, however, is flawed in concept. It is also implemented selectively and inconsistently in practice. Many firms currently report only select Scope 3 items, e.g., employee travel and diesel fuel consumed by suppliers’ vehicles. In principle, the GHG Protocol requires a company to measure its Scope 3 emissions by gathering data from all its multiple-tier suppliers and customers for each of its products. This is a very difficult task, especially when most companies do not even know the identity of suppliers beyond Tier 1 and Tier 2, let alone the carbon emissions of those suppliers. The requirement to estimate the emissions from all downstream customers, who have purchased the company’s products and services, is even more daunting. All companies obviously know their immediate customers, but few know the identity of their customers’ customers, and, especially, all the customers of its customers’ customers. The near-impossibility of obtaining accurate information about total supplier and customer emissions have led to the GHG Protocol standards to allow entities the option of relying on outside consultants who use industry and regional averages, rather than the specific emissions attributable to the firm’s actual suppliers, distributors, and customers. However, allowing entities to use average rather than specific and traceable data fundamentally undermines the integrity of Scope 3 measurement and leads to significant **unreliability**. In the context of financial reporting, such an approach would be akin to an accounting standard that allows an entity to calculate profit margins by using industry-average raw-material costs rather than actual invoiced raw-material costs.

Additionally, the current Scope 3 approach of requiring each entity in a value chain to estimate the accumulated Scope 1 emissions from all its suppliers and customers is unreliable, costly, and leads to **multiple-counting of the same Scope 1 emissions**, an obvious defect for any accounting system. The multiple-counting Scope 3 flaw, if applied to financial reporting, would require each reporting entity to

disclose not only its own profits but also a pro-rated share of the total profits of every supplier, distributor, and customer in its value chain.

A third serious defect with the current practice of estimating Scope 3 emissions is the requirement for companies to estimate and report both their upstream and downstream GHG emissions. The seemingly attractive **symmetric treatment of upstream and downstream GHG emissions**, however, ignores that a company's ability to influence and measure GHG emissions is not symmetric between suppliers and customers. A company has far more control and influence over its suppliers than over its customers, and its customers' customers. Companies can influence and should be accountable for emissions in all its upstream (supplier) operations, but assigning it accountability over downstream emissions, for which they have little-to-no influence and traceability, is a dubious requirement. Consider a company mining iron ore. It cannot influence decisions made by deep-downstream entities, such as companies that build automobiles, airplanes, and appliances made from steel derived from its ores, much less how the final customers and consumers use the products made from the ores and minerals they have mined and extracted. Even direct-to-consumer companies, such as Apple, can neither reliably estimate nor control their end-consumers' use of the products they sell. Some companies can design products that lower their customers' carbon emissions, but the measurement of such downstream benefits is more speculative than the measurement of supply-chain emissions.

Fourthly, because Scope 3 reports are currently based on industry averages rather than actual supply chain emissions, and also typically exclude many sources of supply chain emissions, they **cannot be validated** via full-scope audits. The audit and assurance firms hired voluntarily by some companies conduct only limited-scope audits that produce double-negative opinions in the sense that they could not find inconsistencies or errors in the company's Scope 3 report. Investors should expect that companies' GHG reports have the same integrity and auditability of their financial statements, a criterion that is impossible to meet given the impossibility of obtaining accurate Scope 3 measurements.

We consider Scope 2 emissions to be an anomalous category. The GHG Protocol's authors presumably included the indirect emissions associated with the generation of purchased electricity as a separate category because, unlike most other Scope 3 emissions, emissions in this category can be determined and traced to electricity-consuming entities. Scope 2 emissions are a specific category within a company's upstream Scope 3 emissions.

The inherent flaws of inaccurate, unreliable, and unauditible measurement, multiple counting of the same emissions, and the failure to recognise the asymmetric influence of companies between suppliers and customers, lead us to recommend strongly that the GHG Protocol replace current Scope 3 emissions measurement with robust, accurate, and verifiable supply chain emissions accounting.

4. Describe the proposed change(s) or additional guidance.

Despite the serious flaws in how Scope 3 emissions are currently estimated and reported, **we concur with the intent of identifying a firm's upstream emissions.** Measurement and reporting of supply-chain emissions is essential for the GHG Protocol to achieve its objective of having one consistent global standard that takes a value chain approach to emissions measurement. The Rocky Mountain Institute reports that the average company's supply-chain GHG emissions are 5.5 times

higher than the direct emissions from its own assets and operations. Any effective system of GHG accounting, therefore, needs to accurately measure each entity's supply-chain carbon impacts, providing visibility and incentives for it to make more climate-friendly product-specification and purchasing decisions. For the reported figures to become accurate and reliable, however, the assignment of carbon balances to individual products and services must be done sequentially along the supply chain, with each entity using specific information from its immediate suppliers and from its own Scope 1 emissions to calculate the emissions embedded in its different products.

In a 2021 Harvard Business Review [article](#), we described a robust, accurate, and auditable accounting system for measuring a company's total supply-chain GHG emissions. The conceptual framework for this system is simple and analogous to how companies' cost and inventory accounting systems function today. Each company allocates its direct (Scope 1) and purchased (upstream) emissions to its products and services. These allocations rely on the specifics of the firm's production process as well as the carbon balances of all production inputs as reported by the firm's suppliers. This should be based on **primary supplier-specific emissions data**, not industry averages, therefore giving companies and their customers an accurate picture of the emissions from their specific supply chain.

In this way, whenever a company sells and delivers a product or service to a customer, the customer acquires not only the product/service itself but also "responsibility" (or the E-liabilities) for all the GHG emitted, from cradle to gate, by all the extraction, transportation, and operating processes used to generate that product or service. The GHG information embedded in every company's products is automatically transferred from stage-to-stage of the supply chain. Every company is thus accountable for its direct emissions and the cumulative sum of all upstream emissions in its purchased products and services, and can debit E-liabilities when the emissions in its products and services are transferred down a supply chain, similar to standard inventory accounting.

This system of supply-chain carbon accounting (referred to as "E-liability accounting") **avoids the multiple-counting problem** of the current Scope 3 approach. Electricity purchased from a supplier is just one of many production inputs accounted for, thus obviating the need for the ad hoc Scope 2 category. Upstream and downstream emissions should not be treated the same. This reflects the fact that companies have less influence, control, and visibility of downstream emissions.

The E-liability approach, when implemented across a company's supply chain, can produce numbers that can be assured via a full-scope (or "true and fair") audit. The E-liability method is grounded in the well-established and generally accepted principles for inventory accounting, principles that are entirely familiar to investors and analysts. As a consequence, the E-liability approach can be implemented in parallel to a company's existing financial-accounting infrastructure, making the accounting for carbon emissions **less expensive, comparable, and verifiable** compared to the current ad hoc attempts at estimating Scope 3 emissions.

Beyond the benefits of **more accurate and auditable reporting**, the widespread adoption of the E-liability accounting approach will **motivate companies to be more innovative in their decarbonisation journeys** through their product design, purchasing, and sourcing decisions. The innovations will be guided by a tangible and measurable goal to acquire input products and services that have been produced with lower GHG emissions. The Scope 3 framework was designed for high-level rhetorical inspiration but not for motivating specific management decisions since

companies are not accountable under Scope 3 for the specific GHG emissions produced in their supply chains. This helps to explain the limited progress most companies have made during the past 20 years to decarbonise their supply chains.

Since publication, the November 2021 paper has been recognised with the 2021 HBR-McKinsey Award as the journal's outstanding 2021 publication "for its practical and ground-breaking management thinking." The E-liability Institute - which we co-founded to drive the E-liability method into practice - has initiated pilot projects with several major organisations to demonstrate the feasibility and benefits of the E-liability approach. We have also published a [follow-up paper](#) that includes our findings about the multiple limitations of the GHG Protocol Scope 3 reporting standards, as summarised above. To date, our experience with the multiple pilot projects underway and planned has indicated that the E-liability approach is feasible and practical to implement and will yield insights valuable to companies, as well as their suppliers and customers. We are happy to share relevant learnings from the pilots with the GHG Protocol or even to initiate joint pilots with the WRI/WBCSD if necessary.

We therefore recommend that the GHG Protocol:

- Separate disclosures of downstream value-chain emissions that are by their nature prospective and speculative from accounting for upstream supply-chain emissions.
- Establish a three-year transition period, after which only primary data will be acceptable for supply-chain carbon accounting (except for immaterial GHG quantities). A company, during this transition period, should have the option to remain compliant with the existing GHG Protocol standard while, as we recommend, reporting on activities only under their control and influence: that is their Scope 1 and supply-chain emissions, which would, of course, include the "Scope 2" emissions from its suppliers of electricity.
- Encourage entities to pursue pilot studies of the E-liability approach during a three-year trial period. The pilot studies can be shared, voluntarily, with the World Resources Institute, to enable it to develop more rigorous and cost-effective standards for supply-chain carbon accounting.

The three-year transitional should be adequate to demonstrate how to replace the current Scope 3 approach with the more conceptually correct, feasible, and auditable E-liability GHG accounting system.

Auditors can also play a role in the transition to more accurate GHG accounting. Many companies don't currently seek assurance for their environmental reports. Those that do purchase assurance services only for a "limited-scope audit" designed to produce a double-negative opinion that a company's reported GHG measurements are "not obviously false." Such limited-scope assurance is well below the standard of the opinion provided for a company's financial report: that a reporting company's assertions (say, of the value of its inventory) "are fairly stated, in all material respects."

We therefore also propose that, after the three-year transition period, the only acceptable assurance for a GHG report be a "fairly stated opinion," which would deny assurance to Scope 3 reports based substantively on industry-average data. Such true-and-fair audit opinions would enable companies' GHG reports to have the same reliability as their financial statements, and, like these, provide a sound basis for investment decisions and accountability for corporate performance.

5. Please explain how the proposal aligns with the GHG Protocol decision-making criteria and hierarchy (A, B, C, D below), while providing justification/evidence where possible.

A. GHG Protocol accounting and reporting approaches shall meet the GHG Protocol accounting and reporting principles (see Annex for definitions):

- Accuracy, Completeness, Consistency, Relevance, Transparency
- Additional principles for land sector activities and CO₂ removals: Conservativeness, Permanence, and Comparability if relevant

Accuracy

Ensure that the quantification of GHG emissions (and removals, if applicable) is systematically neither over nor under actual emissions (and removals, if applicable), 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.

As discussed above, the E-liability method, by focusing on primary supplier-specific emissions measurement, is more accurate than the current approach to GHG emissions accounting under Scopes 1, 2, and 3. Additionally, adoption of the E-liability method will enable companies to credibly report their lower per unit GHG outputs to environmentally conscious customers, investors, and the public at large. It will also support strategic decision making by companies to decarbonise its own supply chain and operations, and use this as a source of competitive advantage.

Furthermore, the system allows for its own materiality standard. Currently, several major ESG reporting standards require companies to disclose whenever environmental considerations pose a material financial risk to a company. That allows many GHG-intensive processes to go unreported when they have no material impact on a company's financial statements. The E-liability system can apply a materiality threshold specific for GHG, regardless of the financial impact.

Completeness

Account for and report on all GHG emissions (and removals, if applicable) from sources, sinks, and activities within the inventory boundary. Disclose and justify any specific exclusions.

As set out above, the E-liability method removes the duplication and double-counting within the current approach to Scope 3 emissions. This gives an accurate account of, and reports on, all (Scope 1) GHG emissions within a supply chain. It also allows for full-scope audits that emissions reported by a company are within a non-material margin-of-error of the true emissions – this is impossible under the Scope 3 methodology.

Additionally, we note that the pressure to do sustainability reporting has been put primarily on publicly traded companies, by their investors and analysts. But restricting the reporting of GHG emissions to such companies would motivate some to go private (and the private ones to remain so) to avoid environmental measurement and disclosure. Thus, all companies should be encouraged to report on their E-liabilities, including large private ones such as Bechtel, Bosch, Cargill, Koch, and Mars and those financed through joint ventures, limited partnerships, venture capital, or private equity.

Only very small companies with negligible quantities of acquired and produced GHG should be exempt from E-liability reporting.

However, corporations are not the only traders in GHG emissions. State-owned enterprises and government agencies, including defense, transportation, energy, and health care, produce and consume many tons of emissions, and they too should be expected to adopt E-liability reporting.

Reliable GHG reporting would also help banks and investment funds respond to demands that they report the emissions of their portfolio companies. Standard-setters such as the Financial Stability Board's Task Force on Climate-Related Financial Disclosures have created formulas for determining how to weight various investment assets on the basis of features such as the nature of the security (debt versus equity, for example) and the degree of control exercised by the investment vehicle over that security. Although those formulas can be useful, the current measurement of the underlying pollutants - the sum of a company's Scope 1, 2, and 3 emissions - remains fundamentally flawed, for the reasons we have described. The E-liability method provides a more reliable way of calculating the total pollution from assets under management as a weighted total of the portfolio companies' end-of-period E-liabilities. Banks and investment funds using the system would have a far better foundation for influencing and reporting on their portfolio companies' environmental impact.

A company has far more control and influence over its suppliers than over its customers, and its customers' customers. Companies can influence and should be accountable for emissions in all its upstream (supplier) operations, but assigning it accountability over downstream emissions, for which they have little-to-no influence and traceability, is a dubious requirement. If the GHG Protocol is still interested in downstream reporting, it can of course continue to develop such standards, but not to the exclusion of robust upstream carbon accounting.

Consistency

Use consistent methodologies to allow for meaningful performance tracking of emissions (and removals, if applicable) over time and between companies. Transparently document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series.

As set out above, the difficulty of tracking emissions from multiple suppliers and customers across multi-tier value chains within the current Scope 3 standard makes it virtually impossible for a company to reliably estimate its upstream and downstream emissions. Also, the difficulty of measuring all supply chain emissions under the current Scope 3 standard has led to companies following idiosyncratic and highly selective reporting of their supply chain emissions.

The E-liability method promotes accurate, verifiable, comprehensive, and comparable tracking of emissions over time, between companies, and across complex value chains. The E-liability accounting system requires two basic steps:

1. Calculate the direct emissions the company creates and eliminates each period, adding them to the E-liabilities it acquires and has accumulated, and
2. Allocate some or all of the total E-liabilities to the units of output produced by the company during the reporting period.

For the first step, environmental engineers can estimate the quantity of GHG emissions from a company's primary-source activities, such as burning hydrocarbons for electricity, heat, and transport; producing metals, cement, glass, and chemicals; agriculture involving livestock emissions and deforestation or reforestation; and waste management.

The second step is identical to activity-based costing (ABC) for assigning overhead and other costs to the multiple products and services produced in a given period.

As with physical inventory, E-liabilities acquired or produced but not transferred to customers in a given period are held for future transfer. This feature of E-liability accounting allows companies to hold and depreciate GHG emissions from fixed assets such as plant and equipment.

Some companies may choose to directly eliminate GHG from the atmosphere—for instance, by engaging in carbon capture or reforestation. A company that does so [can subtract that amount](#) from its E-liability account, subject to auditing, thus reducing its liability transfers along the distribution chain to, eventually, the end-use consumer.

With the two accounting steps addressed, companies can report on the stocks and flows of their E-liabilities just as they report on their opening inventory, annual purchases of raw materials, finished goods produced, cost of goods sold, and closing inventory. The equivalent items would be net E-liabilities at the beginning of a period, E-liabilities acquired, net E-liabilities produced during the period, E-liabilities disposed of (sold), and net E-liabilities at the end of the period.

Relevance

Ensure the GHG inventory appropriately reflects the GHG emissions (and removals, if applicable) of the company and serves the decision-making needs of users – both internal and external to the company.

The E-liability approach produces, for every product and service in the economy, an accurate and auditable measure of its total “cradle-to-gate” carbon footprint. This allows every purchaser – whether a company acquiring a batch of cement, a consumer buying a movie on their tablet, or a green investor looking for their next project – to see the total carbon emitted into the atmosphere in creating that specific product. For a product, that would include the emissions from mining all its raw materials, plus all further processing and transportation emissions, down to emissions from last-mile delivery.

As discussed above, the approach allows for actionable strategic decisions by companies and consumers, providing complete carbon data to users, supporting decarbonisation innovations, and ensuring the appropriate allocation of green capital to productive investments.

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.

Blockchain ledgers, starting with direct emissions at source, can be used to accumulate and transfer E-liabilities from stage to stage, reducing accounting and auditing costs across the entire system.

Blockchains initiated at the Scope 1 stage ensure that subsequent E-liability transfers must always reconcile with the total Scope 1 number across value chains. The E-liability system is unlikely to introduce burdensome record-keeping because it can run on a company's existing financial-reporting and cost-accounting infrastructure, simply using a different unit of measurement: the quantity of GHG emissions rather than the amount of cash and cash equivalents.

Finally, a company's end-of-period E-liability balance can be audited in much the same way that its financial asset and liability accounts are. The external auditors (preferably a team including environmental engineers and cost accountants) can verify the company's internal GHG measurement and allocation models and its purchases and transfers, particularly of GHG-intensive products and services, and reconcile E-liability balances at the beginning and the end of the period. Auditors can cross-check a client's E-liability transactions with corresponding activity in the financial accounts: A red flag would be raised if E-liabilities booked seemed unusually small, relative to industry peers, for the scale of the client's inventory movements in a period. Just as a good financial analyst looks beneath a company's net income to analyse cost of goods sold and changes in inventory levels, an environmental analyst could interpret the details of a company's purchase, production, and disposal of E-liabilities.

B. GHG Protocol accounting and reporting approaches shall align with the latest climate science and global climate goals (i.e., keeping global warming below 1.5°C). To support this objective (non-exhaustive list):

- Direct emissions reported in a company's inventory should correspond to emissions to the atmosphere. Reductions in direct emissions reported in a company's inventory should correspond to reductions in emissions to the atmosphere.
- Indirect emissions reported in a company's inventory should in the aggregate correspond to emissions to the atmosphere. Reductions in indirect emissions reported in a company's inventory should in the aggregate correspond to reductions in emissions to the atmosphere.

As the E-liability method promotes the use of primary, supplier-specific emissions data, and eliminates the duplicative counting of emissions that is embedded in current Scope 3 measurements, we believe this method supports companies, investors, consumers, and governments to achieve global climate goals.

To illustrate, start with the car-door manufacturer's furthest-removed supplier, a mining company in (let's say) Perth, in western Australia. That company extracts the metallurgical coal and iron ore that eventually find their way into the door. It measures its total Scope 1 emissions during a reporting period using a combination of chemistry and engineering, and then, combining that science with cost accounting, assigns its total emissions to the tons of coal, iron ore, and all other minerals extracted during the period. The latter process is similar to the way it estimates the unit production costs of its outputs in a standard activity-based costing system (more on this below). The calculation produces an estimate of GHG emissions per unit of each type of material produced.

Additionally, the E-liability method reduces incentives for gaming and manipulation. A company cannot reduce its reported Scope 1 emissions simply by outsourcing production and then, as is currently possible, ignoring its Scope 3 emissions on the grounds of high measurement error and lack

of access to distant suppliers and customers. In the E-liability system, any GHG emissions produced by an outsourced supplier will be transferred to the company upon purchase. What's more, a company can't benefit from understating the E-liability transferred to its customers, because its own end-of-period net E-liability would steadily escalate, suggesting that the company's products are more heavily polluting than customers will accept. Conversely, a company attempting to overstate E-liability transfers to downstream customers would meet with resistance from buyers that preferred to engage with less-polluting suppliers.

C. GHG Protocol accounting frameworks should support ambitious climate goals and actions in the private and public sector.

- Would this proposal enable organizations to pursue more effective GHG mitigation/decarbonization efforts as compared to the existing standards and guidance? If so, how?
- Would this proposal better inform decision making by reporting organizations and their stakeholders (e.g. related to climate-related financial risks and other relevant information associated with GHG emissions reporting)?

The widespread adoption of the E-liability accounting approach will motivate companies to be more innovative in their product design, purchasing, and sourcing decisions. The innovations will be guided by a tangible and measurable goal to acquire input products and services that have been produced with lower GHG emissions. The Scope 3 framework was designed for rhetorical disclosure of the aspirational kind, but not for motivating management decisions since companies are not accountable for the specific GHG emissions produced in their supply chains. This helps to explain the limited progress most companies have made during the past 20 years to decarbonise their supply chains.

Unlike a standard and static EPD/product life-cycle emissions report, which some companies currently produce about every three years, the E-liability approach produces dynamic, real-time reports on all of a company's products, based on its current processes, sourcing, and designs. The E-liability approach provides strong incentives for innovations in real-time carbon reduction.

D. GHG Protocol accounting frameworks which meet the above criteria should be feasible. (For aspects of accounting frameworks that meet the above criteria but are difficult to implement, GHG Protocol should provide additional guidance and tools to support implementation.)

- What specific information, data or calculation methods are required to implement this proposal (e.g., in the case of scope 2, data granularity, grid data, consumption data, emission information, etc.)? Would new data/methods be needed? Are current data/methods available? How would this be implemented in practice?
- Would this proposal accommodate and be accessible to all organizations globally who seek to account for and report their GHG emissions? Are there potential challenges which would need to be further addressed to implement this proposal globally? What would be the potential solutions?

As noted above, the E-liability Institute has initiated pilot projects with several major companies across different industries and regions, to demonstrate the feasibility and benefits of the E-liability approach. To date, our experience with the multiple pilot projects underway and planned has indicated that the E-liability approach is feasible and practical to implement and will yield insights valuable to companies, as well as their suppliers and customers.

E-liability carbon accounting does not require complicated and expensive software systems on which to run. All it requires, at a base level, is accurate calculations of a company's direct emissions and those of its suppliers. The cost accounting that follows is already widely understood and practiced across organisations, and it is well supported by software companies, auditors, and other intermediaries.

Information technologies such as blockchain, combined with existing inventory and cost-accounting systems, can record, transmit, and provide an audit trail for E-liability transactions. The emissions data for each product will automatically aggregate into company-level accounts – just like in financial reporting. The data can be presented in a similar format as a financial balance-sheet, making it easy for independent analysts to verify.

6. Consistent with the hierarchy provided above, are there potential drawbacks or challenges to adopting this proposal? If so, what are they?

Some environmental activists may fear that transferring a company's entire Scope 1 emissions to downstream customers will enable the company to escape scrutiny for GHG-intensive operations. However, as noted above, any competent environmental analyst could interpret the details of a company's purchase, production, and sale of E-liabilities from the accounting statements we propose.

7. Would the proposal improve alignment with other climate disclosure rules, programs and initiatives or lead to lack of alignment? Please describe.

The E-liability Institute focuses on partnerships with ecosystem players and equipping these groups with the conceptual understanding of the E-liability principles needed to guide adoption. (The E-liability Institute itself has no interest in being a standard-setter; rather, we seek to improve carbon standards.) Alignment with other climate disclosure rules, programs, and initiatives is straightforward, as long as the players are committed to robust carbon accounting. For example, the GHG Protocol could clarify the distinction between downstream 'disclosure' and upstream 'accounting' and adapt its standards to integrate E-liability's principles. Likewise, ISO could adapt PAS 2050 or ISO 14067:2012, or introduce a new standard to reflect E-liability's rigorous accounting principles. Another example would be for the Partnership for Carbon Transparency (PACT) to integrate E-liability's principles into its Pathfinder Framework 2.0. Similarly, Catena-X principles can be easily made E-liability compliant. Finally, E-liability principles take the spirit of the LCA process (which avoids the multiple-counting problem in Scope 3) and makes it dynamic. So, unlike LCAs, which are only feasible for select products

and at discrete intervals, E-liability calculations are doable across the whole suite of an organisation's products/services and in real-time.

8. Please attach or reference supporting evidence, research, analysis, or other information to support the proposal, including any active research or ongoing evaluations. If relevant, please also explain how the effectiveness of the proposal can be evaluated and tracked over time.

Robert S. Kaplan and Karthik Ramanna. "Accounting for Climate Change". *Harvard Business Review*, November/December 2021. Accessible: <https://hbr.org/2021/11/accounting-for-climate-change>

Robert S. Kaplan and Karthik Ramanna. "We Need Better Carbon Accounting. Here's How to Get There". *Harvard Business Review*. April 12, 2022. Accessible: <https://hbr.org/2022/04/we-need-better-carbon-accounting-heres-how-to-get-there>

Robert S. Kaplan, Karthik Ramanna, and Marc Roston. "Accounting for carbon offsets – Establishing the foundation for carbon-trading markets". Stanford Sustainable Finance Initiative Precourt Institute for Energy, February 2023; University of Oxford Blavatnik School of Government Working Paper No. BSG-WP-2023/051; Harvard Business School Research Paper No. 23-050. Accessible: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4362921

Robert Kaplan, Karthik Ramanna, Vibhuti Gour, and Sarah McAra, "What does an E-liability pilot look like? The case of Giti Tire" [Oxford Blavatnik School Case](#) (November 2022).

Robert Kaplan, Karthik Ramanna, and Stefan Reichelstein, "How to Make Your Decisions Climate Friendly," *Harvard Business Review Online* forthcoming.

Stephen Comello, Julia Reichelstein, and Stefan Reichelstein, "Transparency and Accountability on the Path to Net-Zero," Working paper 2023.

Marc Roston, Alicia Seiger, and Thomas Heller, "[The Road to Climate Stability Runs through Emissions Liability Management](#)," Working paper 2023.

The effectiveness of the E-liability approach is currently being evaluated and tracked through numerous pilots with companies in varied industries. These pilots are developing evidence of the benefits and costs associated with the E-liability methodology. Pilots refine the E-liability approach by tackling concrete challenges on the user journey across methodology, data, tools, validation, transfers, etc. They create a knock-on scaling effect by piloting companies encouraging their suppliers and customers to participate. Finally, they provide proof-points to give voluntary standards and regulators confidence in mandating its use. (As the pilots are complete, we expect to publish reports and case studies on the E-liability website; we also encourage the GHG Protocol to work with us on future pilots.)

Pilots can test various elements to enable scaled adoption:

- New industry/product: Pilots focused on a previously untried product/industry can distill best practices regarding how to calculate and allocate emissions for specific industries, products, and services (e.g., tires, dairy, hip replacements) to ease implementation for other entities in that industry.
- New geography: Pilots with companies in previously untried geographies can capture lessons regarding how emission calculation/transfer works in particular regions (e.g., lesser developed economies) and can build momentum for adoption in those areas
- Data sharing: Pilots focused on data sharing (e.g., between different companies with same parent company) can clarify best practices for balancing ease, reliability, and confidentiality, which could make adoption more attractive for other companies
- Data verification/allocation: Pilots focused specifically on data verification/allocation may spend extra time developing capabilities to measure their emissions and develop strategies for allocating them, which could inform how similar companies could do so
- Role of offsets: Pilots with companies most interested in understanding offsets could test how offsets can be accounted for and when they can be legitimately employed to reduce companies' E-liabilities, encouraging the adoption by companies who use offsets
- Auditing techniques: Pilots that partner with auditors could trial auditing techniques (e.g., auditing at the source, auditing allocations, auditing end-of-period E-balance sheets) to develop best practices for data assurance, increasing stakeholders' faith in the validity of the data being used by adopters
- Tokenisation technology: Pilots that focus on tokenisation technology (and may partner with third-party tech companies) can develop and test tokenisation technology, which could eventually be used to track all E-liabilities across the value chain, increasing adoption
- Integration with existing disclosure requirements: Pilots that focus on integrating the E-liability approach with existing disclosure requirements could clarify how E-liability's data can be used to create more accurate disclosure reports, increasing harmonisation between E-liability and existing standards, making it easier for companies to adopt E-liability while still meeting their disclosure commitments
- Types of corporate decision-making: Pilots that focus on corporate decision-making can build evidence regarding the positive, material value of E-liability in decarbonisation, increasing the attractiveness of adoption and providing evidence that could be used by regulators to create regulatory guidance around E-liability

9. If applicable, describe the process or stakeholders/groups consulted as part of developing this proposal.

We are working with a range of government bodies, industry associations, standard-setters, regulators, and businesses from across the world.

We are also working closely with a number of businesses/organisations who are piloting the E-liability method within their supply chains. You can read our first case study with Giti Tire [here](#).

10. If applicable, provide any additional information not covered in the questions above.

Tackling climate change requires not only reducing GHG emissions but also removing GHG from the atmosphere. Carbon-offset producers purport to provide such removals. However, existing carbon-offset markets have been criticised for poor measurement practices and inadequate controls, resulting in transaction of products that do not materially sequester carbon. To address these challenges, we apply basic financial-accounting principles to develop an accurate and auditable framework for offset accounting. The offset-accounting principles in [this paper](#) complement and extend the E-liability method of accounting for GHG emissions. Together, rigorous accounting for emissions and offsets can improve and expand markets for impactful decarbonisation.

See more on the E-liability method in action on our website: <https://e-liability.institute/>

Proposal Annex

GHG Protocol Decision-Making Criteria and Hierarchy

- A. First, GHG Protocol accounting and reporting approaches shall meet the GHG Protocol accounting and reporting principles:**
- Accuracy, Completeness, Consistency, Relevance, Transparency
 - Additional principles for land sector activities and CO₂ removals: Conservativeness, Permanence, and Comparability if relevant
 - (See table below for definitions)
- B. Second, GHG Protocol accounting and reporting approaches shall align with the latest climate science and global climate goals (i.e., keeping global warming below 1.5°C). To support this objective (non-exhaustive list):**
- Direct emissions reported in a company's inventory should correspond to emissions to the atmosphere. Reductions in direct emissions reported in a company's inventory should correspond to reductions in emissions to the atmosphere.
 - Indirect emissions reported in a company's inventory should in the aggregate correspond to emissions to the atmosphere. Reductions in indirect emissions reported in a company's inventory should in the aggregate correspond to reductions in emissions to the atmosphere.
- C. Third, GHG Protocol accounting frameworks should support ambitious climate goals and actions in the private and public sector:**
- Accounting framework/s would enable organizations to pursue more effective GHG mitigation/decarbonization efforts as compared to the existing standards and guidance
 - Accounting framework/s would better inform decision making by reporting organizations and their stakeholders (e.g. related to climate-related financial risks and other relevant information associated with GHG emissions reporting)
- D. Fourth, GHG Protocol accounting frameworks which meet the above criteria should be feasible to implement for the users of the frameworks.**
- For aspects of accounting frameworks that meet the above criteria but are difficult to implement, GHG Protocol should provide additional guidance and tools to support implementation.

GHG Protocol Accounting and Reporting Principles

Principle	Definition
Accuracy	Ensure that the quantification of GHG emissions (and removals, if applicable) is systematically neither over nor under actual emissions (and removals, if applicable), 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.
Completeness	Account for and report on all GHG emissions (and removals, if applicable) from sources, sinks, and activities within the inventory boundary. Disclose and justify any specific exclusions.

Consistency	Use consistent methodologies to allow for meaningful performance tracking of emissions (and removals, if applicable) over time and between companies. Transparently document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series.
Relevance	Ensure the GHG inventory appropriately reflects the GHG emissions (and removals, if applicable) of the company and serves the decision-making needs of users – both internal and external to the company.
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.
Conservativeness (Land Sector and Removals Guidance)	Use conservative assumptions, values, and procedures when uncertainty is high. Conservative values and assumptions are those that are more likely to overestimate GHG emissions and underestimate removals, rather than underestimate emissions and overestimate removals.
Permanence (Land Sector and Removals Guidance)	Ensure mechanisms are in place to monitor the continued storage of reported removals, account for reversals, and report emissions from associated carbon pools.
Comparability (optional) (Land Sector and Removals Guidance)	Apply common methodologies, data sources, assumptions, and reporting formats such that the reported GHG inventories from multiple companies can be compared.