



An invitation to pilot the **the E-liability approach** to rigorous GHG accounting

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What is the problem we need to solve?

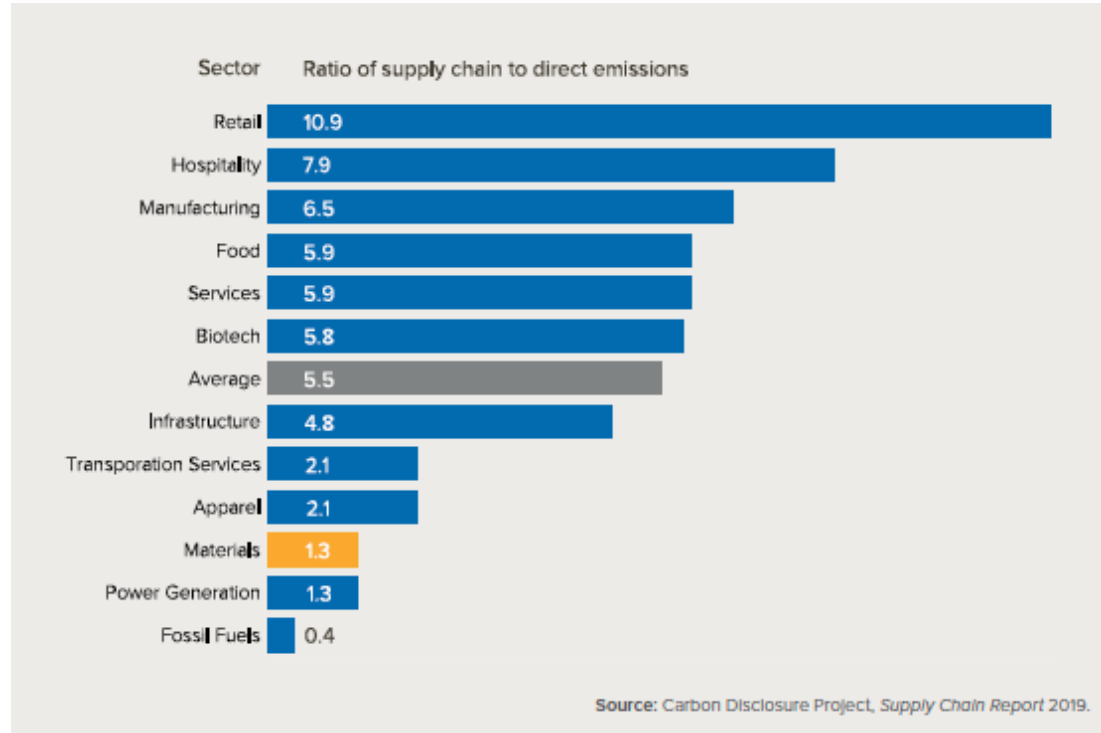
Consider one of the most basic decisions in green energy: to build a wind turbine to replace a coal-fired power plant. While we know the **total monetary cost** of building a wind turbine, to date, we do not know the **total GHG impact** of building a wind turbine.

Calculating the total GHG impact of any product or service is not just an engineering problem: it is a **GHG supply-chain accounting** problem.

Companies, consumers, investors, and governments need rigorous GHG supply-chain accounting to make sound decisions on managing climate change.



Controlling supply-chain emissions is critical to addressing climate change





The current standard for GHG supply-chain accounting is called “Scope 3”

Scope 1:

Direct GHG emissions from sources that are owned or controlled by a company

Scope 2:

GHG emissions attributed to electricity and heat purchased and consumed by the company

Scope 3:

Indirect GHG emissions from upstream and downstream operations



The Scope 3 standard has well-known weaknesses

Inaccurate: The standard's top-down approach means collecting "supplier-specific" Scope 3 data is impossible for any sizeable company in a modern value-chain. The standard then allows companies to supplement primary data with industry-average data, analogous to FASB/IASB allowing companies to use industry-average gross margins, instead of actual margins. The result is guesstimates and gaming of GHG accounts.

Multiple-counting: A product with "n" entities in its supply chain will have its emissions (and offsets) counted n times. This is analogous to FASB/IASB allowing a company to report in its own profits a share of the profits of all its suppliers and customers.



How do we propose to solve the problem?

Until 2021, we had no practicable way of solving the GHG supply-chain accounting problem so as to have an accurate and auditable measure of the total GHG impact of any product or service transacted in the economy.

But in 2021, two professors from Harvard and Oxford proposed a simple solution based on well-understood inventory- and cost-accounting methods.

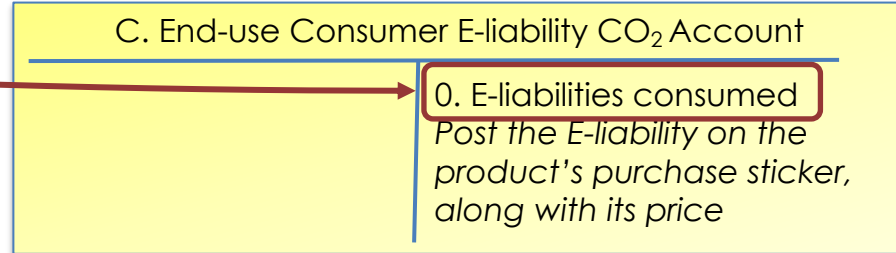
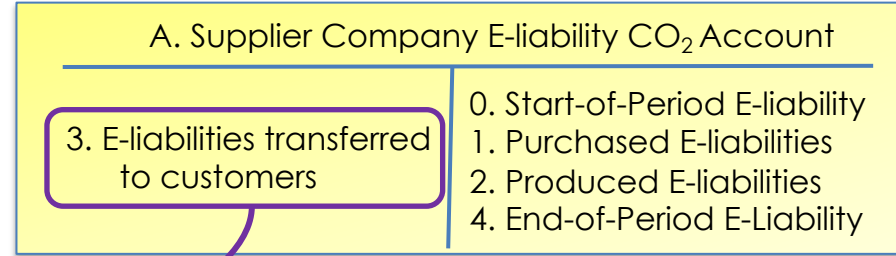
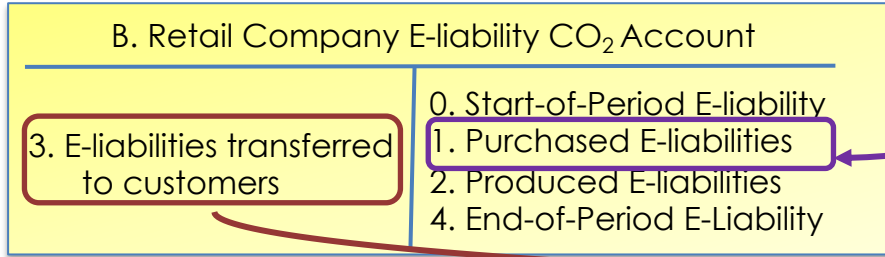
The idea – called ***E-liability accounting*** (“E” for environment) – has since won the [HBR-McKinsey Prize](#) for “groundbreaking management thinking.”



The E-liability solution to GHG supply-chain accounting

The basic idea:

Measure GHG at the product-level rather than at the entity-level.

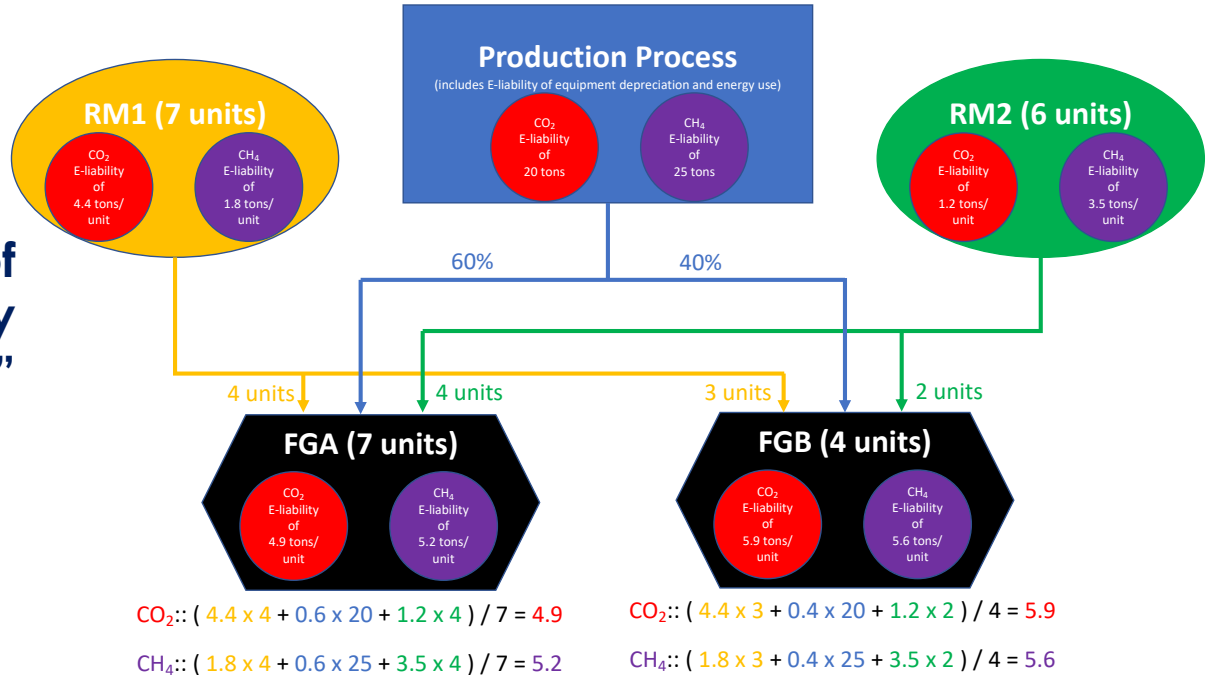


When a product is sold, transfer the inventory (on financial-accounting books) AND the E-liability (on E-accounting books).



The E-liability solution to GHG supply-chain accounting

An example of E-liability “cost accounting”





The E-liability solution to GHG supply-chain accounting

An example of
E-liability
“enterprise reporting”

| E-liability flows | Tons of CO₂ |
|--|-------------------------------|
| Opening E-liabilities | 3,600 |
| Add E-liabilities acquired from suppliers | 39,800 |
| <i>Electricity</i> | 5,600 |
| <i>Sheet steel</i> | 10,600 |
| <i>Glass</i> | 5,400 |
| <i>Fabric and plastic</i> | 1,200 |
| <i>Other supplies/components</i> | 4,800 |
| <i>Capital equipment</i> | 12,200 |
| Add E-liabilities directly produced through operations | 2,600 |
| Subtract E-liabilities offset through purchases and operations | (4,000) |
| Subtract E-liabilities transferred to customers | (32,600) |
| Closing E-liabilities | 9,400 |
| <i>Change in E-liabilities during period</i> | <i>5,800</i> |



The E-liability solution to GHG supply-chain accounting

The E-liability approach allows “true and fair” audits

1. When a company produces (Scope 1) direct emissions, these are recorded in a blockchain along with third-party assurance. The blockchain enables atomisation and verifiable transmission of emissions across supply chains.
2. The blockchain facilitates assurance of entity- and product-level E-liability accounts. Each company’s periodic E-liability statement can be audited analogously to “accounts payable.”



The E-liability solution to GHG supply-chain accounting

Advantages of the E-liability method

- ✓ Avoids multiple-counting and guesstimates
- ✓ Allows companies to verifiably compete on emissions reductions
- ✓ Incorporates GHG contra-emissions (offsets)
- ✓ Cost-effective to prepare and analyse
- ✓ Addresses the materiality and fungibility concerns with ESG
- ✓ Provides a basis for carbon taxation, if needed



What needs to happen to make E-liabilities the global standard?

1.
Ambitious companies seeking a competitive advantage lead on E-liability in their supply chains.

2.
Auditors and ERP providers develop E-liability products.

3.
SEC, ISSB, EFRAG jointly embrace a three-year phase-out of industry-average data.

4.
E-liability approach provides the blueprint for robust S-reporting on modern slavery, worksite harms, etc.



Which companies make good pilots of E-liability accounting?

1.
Those with significant upstream and direct emissions for a given product.

2.
Those with a potential competitive-advantage in GHG emissions from their own production and/or supply-chain.

3.
Those with GHG-sensitive customers and investors.

Current and planned pilots include global market-leaders in cement, glass, steel, and tires.



What does it mean to be an E-liability pilot?

Being a pilot does not involve calculating the entire supply-chain GHG emissions on all products and services all at once.

Instead, we suggest each company pick just one high-salience, high “Scope 1” product; then work with its top-three suppliers (by their Scope 1) to develop a first-iteration report.

A first-time pilot should take 6-9 months, and over each subsequent iteration, the E-liability reports will become more comprehensive and accurate.

First movers in an industry can reap value from pilots even after the first iteration given the lack of competition.

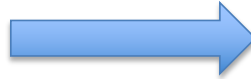


The catalysing role of the E-liability Institute

We will create a small, high-powered not-for-profit “secretariat” to work with key players in business and government to drive E-liability into practice and acclimate people to its use.

Supporting pilots

by providing technical knowhow, ensuring accounting concepts are faithfully implemented, and rewarding innovators



Building knowledge

through continuous improvement of the accounting concepts and of their practice



Driving adoption

by widening the use-case across customers, investors, and regulators





Interested in piloting E-liabilities?

Email Professor Ramanna: ramanna@alum.mit.edu

Our upcoming projects focus on:

- **rigorous accounting for GHG offsets**
- **rigorous reporting of “downstream” GHG impact**

Further reading:

1. <https://hbr.org/2021/11/accounting-for-climate-change>.
2. <https://hbr.org/2022/04/we-need-better-carbon-accounting-here-how-to-get-there>.
3. <https://www.mckinsey.com/about-us/new-at-mckinsey-blog/hbr-mckinsey-award-winners-a-cleaner-smarter-way-to-measure-ghg-emissions>.