5 December 2023
Slides must accompany presentation: Not for standalone distribution

A simple approach to accurate and reliable carbon accounting

E-liability Institute

to catalyze better climate-related decision-making

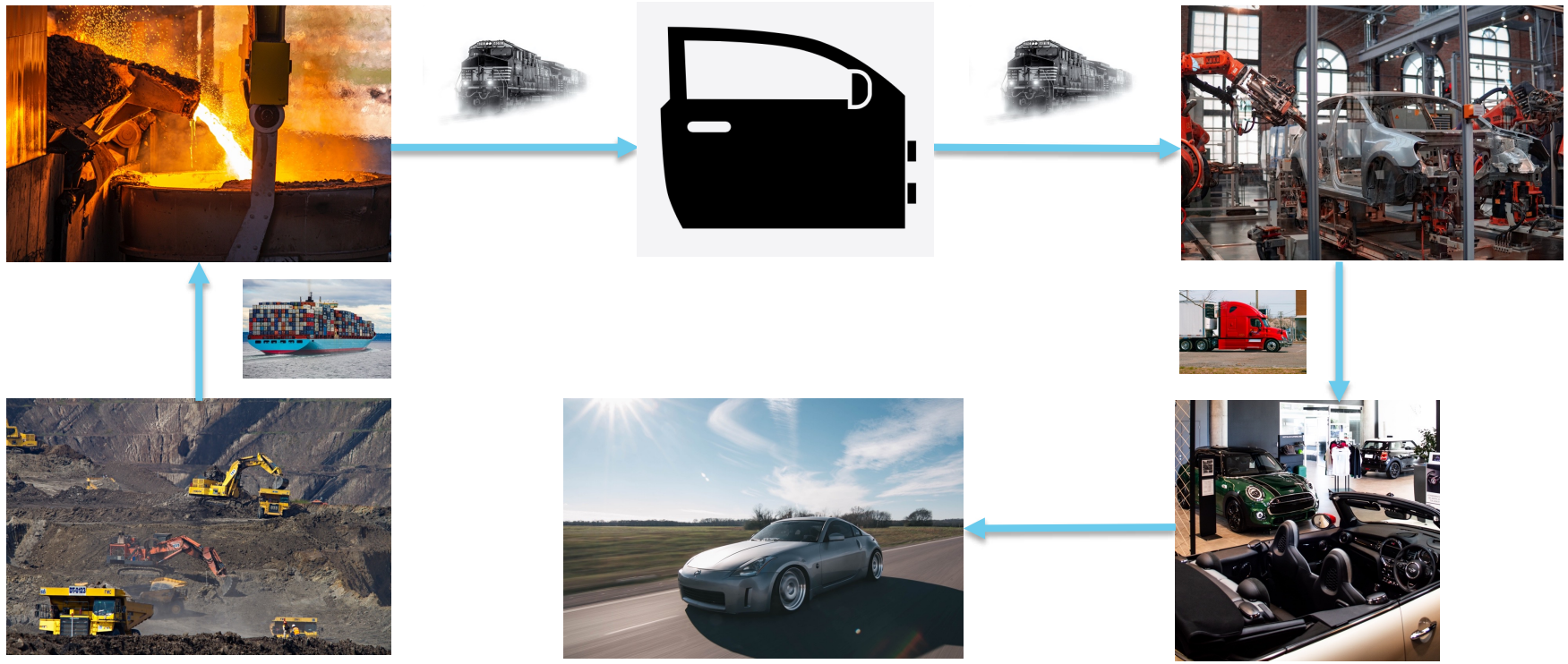
www.E-liability.institute

What is the problem we are solving?

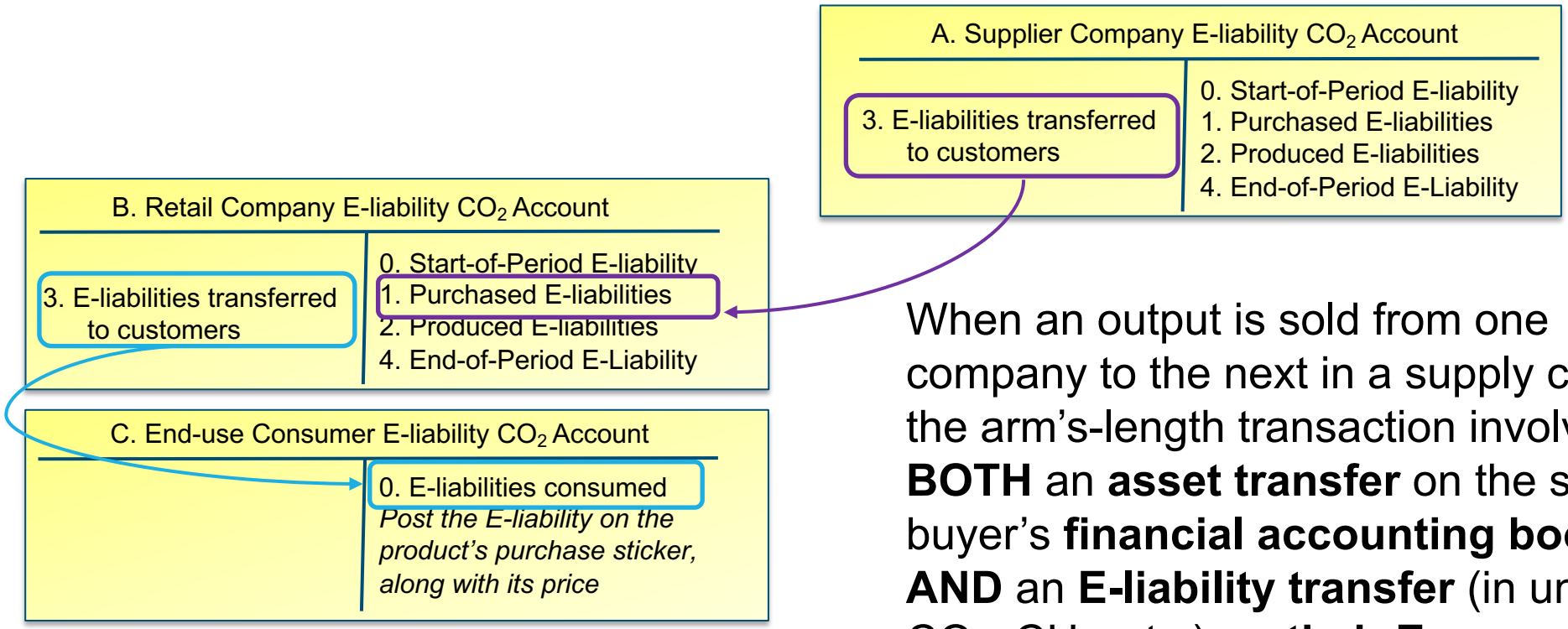
- ✓ **How can an organization identify *specific* actions to decarbonize its outputs, and how can it differentiate those outputs from others when it has done so?**
- ✓ **How can financiers identify *specific* low-carbon investment opportunities and hold their investees to account on decarbonization targets?**

Existing carbon-measurement approaches – e.g., product-level LCA analysis and company-level Scope 3 analysis – are highly approximate methods, prone to error and manipulation.

E.g., how to calculate the specific carbon emissions in a car door?



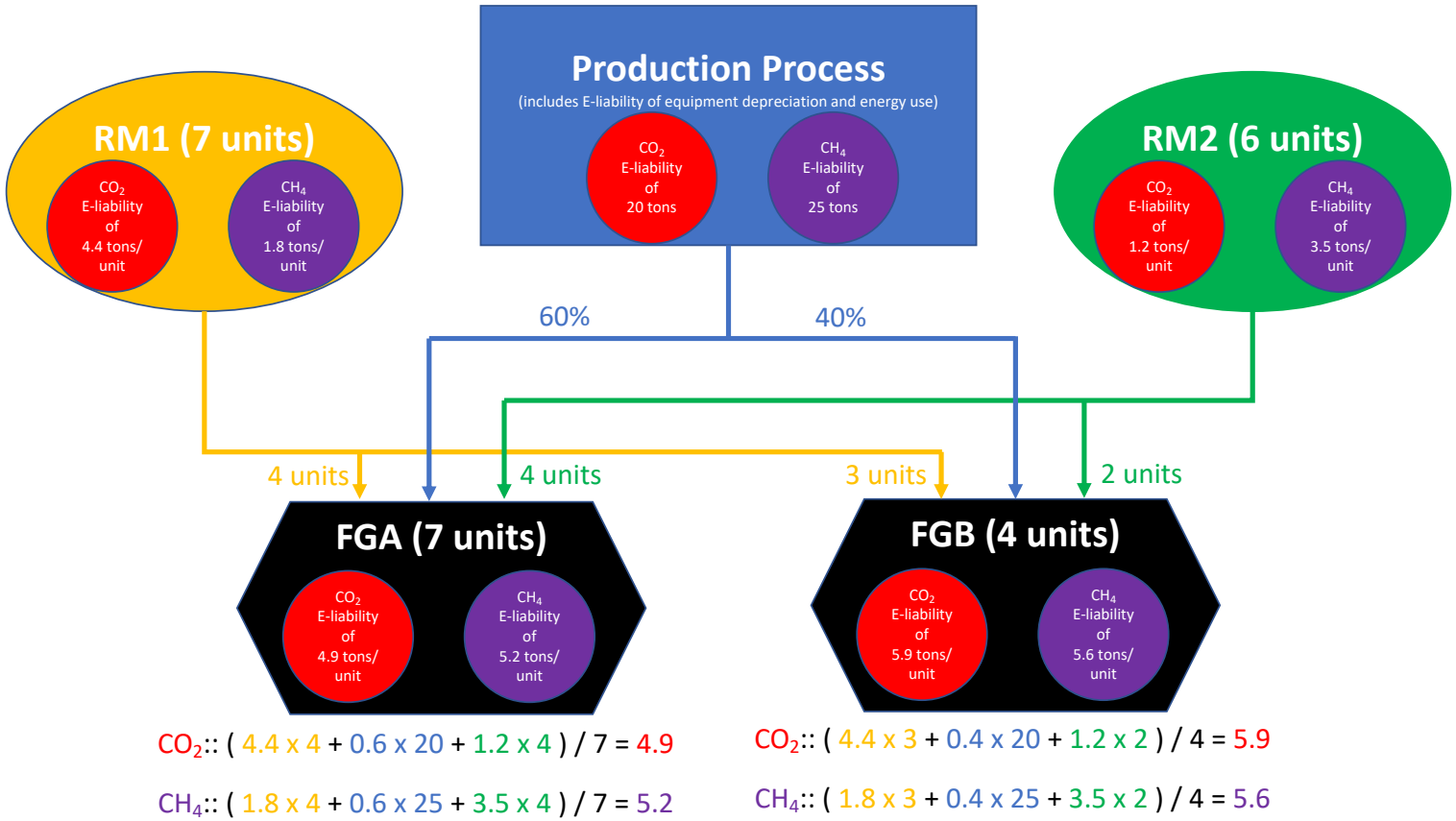
Our solution: Apply a value-added approach, similar to a VAT system



When an output is sold from one company to the next in a supply chain, the arm's-length transaction involves **BOTH** an **asset transfer** on the seller & buyer's **financial accounting books AND** an **E-liability transfer** (in units of CO_2, CH_4, etc.) **on their E-accounting books.**

Our solution: Apply a value-added approach, similar to a VAT system

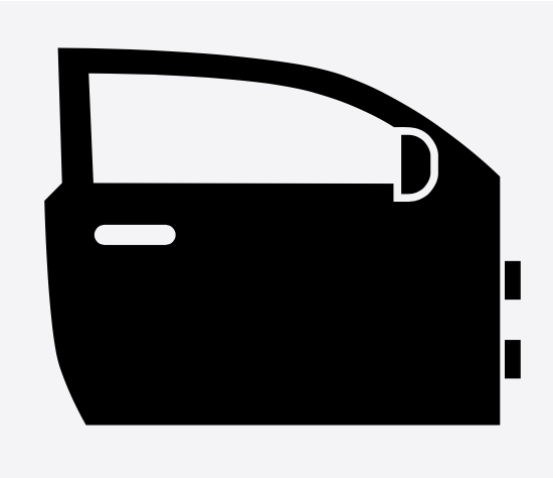
E-liability "cost accounting"



Our solution: Apply a value-added approach, similar to a VAT system

E-liability "enterprise reporting"

E-liability flows	Tons of CO_2	
Opening E-liabilities		**3,600**
Add E-liabilities directly produced through operations	2,600	
Add E-liabilities acquired from suppliers	39,800	
Electricity	*5,600*	
Sheet steel	*10,600*	
Glass	*5,400*	
Fabric and Plastic	*1,200*	
Other supplies/components	*4,800*	
Capital equipment	*12,200*	
Subtract E-liabilities transferred to customers	(32,600)	
Closing E-liabilities		**13,400**
Change in E-liabilities during period		*9,800*



Companies can report on the stocks and flows of their E-liabilities just as they report on their stocks and flows of inventory. E-liabilities acquired or produced, but not transferred to customers in each period, are held for future transfer. This feature allows companies to **hold and depreciate GHG emissions from fixed assets** such as plant and equipment.

Benefits of the E-liability approach

The approach generates accurate and real-time emissions of any product or service, and it can be used by managers to decarbonize their purchasing, product-design, and production decisions.

The approach reduces incentives for gaming and manipulation.

- A company **cannot reduce its emissions footprint by outsourcing production**, because relevant GHG emissions incurred by an outsourced supplier will be transferred to the company upon purchase of the underlying inputs.
- A company **cannot benefit from understating E-liability transfers to its customers**, because its own end-of-period E-liability would steadily escalate, implying that the company's products are heavy polluters.
- A company **cannot benefit from overstating E-liability transfers to its customers**, as the buyers have to then assume those liabilities.

The measures **can be audited to the same standard as financial accounts**, so the approach can be used to **verifiably compare companies**, resulting in **better investment and accountability decisions over decarbonization**.

How the E-liability method works at the organizational level:

Steps involved for an entity

1. **Measure (and tokenize) all direct emissions** ⚠
2. **Transfer in E-liabilities from immediate suppliers** ✓
3. **Purchase removal offsets, if needed** ✓
4. **Allocate E-liabilities to products (akin to cost accounting)** ⚠
5. **Transfer out products' embedded E-liabilities to immediate customers**

⚠ **Requires third-party assurance**

✓ **Pre-verified by seller's auditor**

✓ **Each entity needs only to know its direct emissions and the emissions embedded in inputs purchased from immediate suppliers.**

✓ **Emissions are calculated and audited *only once*, at the place where they occur, improving accuracy and lowering compliance costs**

Technology enables E-liability deployment at scale and low cost

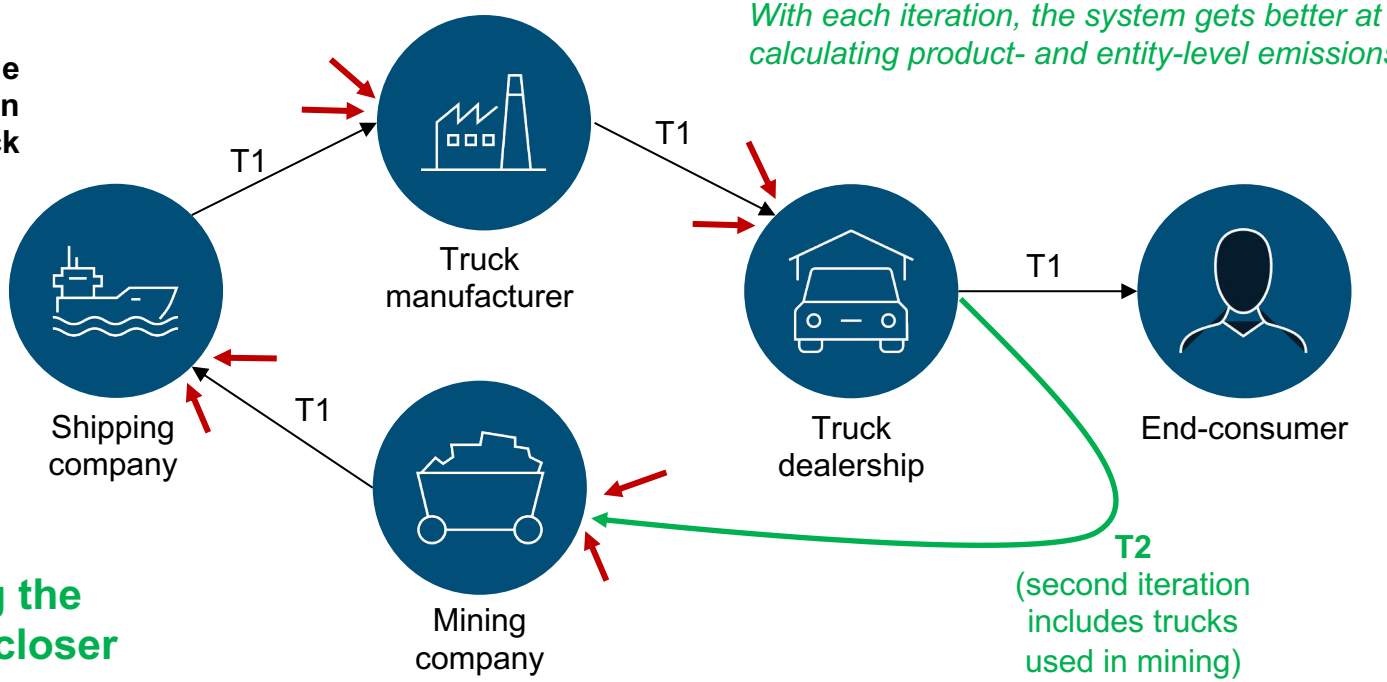
- **Distributed ledgers are especially useful in recording direct emissions** at each stage so that subsequent E-liability transfers must always reconcile with the total (Scope 1) emissions number in a value chain.
- **Tokenization (using blockchains, for example)** can be used to transfer and store E-liabilities from stage to stage, reducing accounting and auditing costs across the entire system.
- **The E-liability system can run on a company's existing inventory-accounting infrastructure,** simply using a different unit of measurement: the quantity of GHG emissions rather than monetary costs.

How the E-liability method works at a systemic level:

T1 = first iteration
T2 = second iteration
…
With each iteration, the system gets better at calculating product- and entity-level emissions.

1 **At the heart of the E-liability algorithm is the principle of *recursion*, which involves solving a bigger (seemingly insurmountable) problem (i.e., calculating the GHG of all products and entities in an economy) by breaking it down into smaller sub-problems.**

Sample value-chain for a truck



2 ***Successive iterations* of solving the smaller sub-problems bring us closer to nailing the bigger problem.**

3 **At first, using the E-liability process in only a few companies will yield approximate results; but, over time, as more companies in a value chain embrace the approach, the results get successively more accurate.**

About us

- E-liability accounting principles were developed in 2021 by **Professor Robert Kaplan (Harvard) and Professor Karthik Ramanna (Oxford)**.

- In 2022, the idea won the **Harvard Business Review-McKinsey Prize** for “groundbreaking management thinking,” and we established **the non-profit E-liability Institute** to drive the idea into practice.

The E-liability Institute’s objectives:

- **Recruit early adopters to pilot E-liability implementation (50+ engagements in process)**

- **Support the transition from pilots to enterprise-wide to value-chain implementation**

- **Catalyze global adoption of E-liability as the gold standard of decarbonization accounting**

In less than 12 months, the Institute has made significant progress

Sample in-process or completed pilots

Sample software and assurance intermediaries

Sample in-process standards

Want to learn more? Email us at info@E-liability.Institute

Further reading:

Robert Kaplan and Karthik Ramanna, "Accounting for Climate Change," *Harvard Business Review* 99, no. 6, 2021.

Robert Kaplan and Karthik Ramanna, "We Need Better Carbon Accounting, Here's How to Get There," *Harvard Business Review Online* 2022.

Robert Kaplan, Karthik Ramanna, and Stefan Reichelstein, "Getting a Clearer View of Your Company's Carbon Footprint," *Harvard Business Review Online* 2023.

Robert Kaplan, Karthik Ramanna, and Marc Roston, "Accounting for Carbon Offsets," *Harvard Business Review* 101, no. 4, 2023.

Robert Kaplan, Karthik Ramanna, and Marc Roston, "A Game Plan for Funding Carbon Offsets," *Harvard Business Review Online* 2023.

Karthik Ramanna and Harry Kirk, "Why Recycled Materials Don't Always Generate Greener Products," *Harvard Business Review Online* 2023.