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# Summary: Evolving E-ledgers: Conceptual Advances and Real-World Applications

On October 10th, 2024, the E-liability Institute successfully hosted its third conference, *Evolving E-ledgers: Conceptual Advances and Real-World Applications*. The virtual event brought together over 250 industry practitioners and Institute staff to advance the field of rigorous carbon accounting. It featured critical discussions on the latest developments in carbon accounting methodologies and their practical implications across various sectors. You can watch the full conference recordings here.

## Session 1: An Update On the E-ledgers Framework

The first session, moderated by E-liability Institute Board Member **Alicia Seiger** of Stanford University, focused on recent updates to the E-ledger framework.

**Professor Robert Kaplan** of Harvard University, co-founder and senior fellow at the E-liability Institute, introduced the Disclosing Downstream Emissions paper (co-authored with Professor Karthik Ramanna).

Key insights include:

- Upstream emissions are controllable through supply chain decisions, while downstream emissions, arising from customer and consumer use, are more challenging to control.
- That said, a legitimate case can be made for some B2C companies to report on downstream consumer emissions.
- Such reporting necessarily constitutes “disclosure” not “accounting.”
- The paper identifies which B2C companies should report downstream emissions and which should not.
- The paper also discusses the format for such disclosures: Companies should report emissions intensity per unit of use rather than total emissions, acknowledging their limited control over consumer behavior.

**Professor Karthik Ramanna** of Oxford University, Co-founder and Principal Investigator at the E-liability Institute, introduced a new paper, co-authored with Professor Maria T. Zuber (MIT), Michael Wang (Argonne National Laboratory), and Niels Angel (Catena-X), on the link between E-liability and Life Cycle Assessments (LCAs). Karthik demonstrated the workings of the recursive principle to continually improve the accuracy of E-liability carbon accounting (paper forthcoming).

Key insights include:

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- The E-liability algorithm can be implemented in phases, utilizing the recursive principle and existing emissions databases to achieve the desired accuracy within a manageable timeframe.
- Databases like GREET and SESAME provide excellent starting values for emissions data when primary data are unavailable. These databases act as proxies until more accurate (primary) data is obtained.
- The recursive principle enhances carbon accounting accuracy over time by progressively refining estimates with each round.
- Crucially, this requires databases like GREET and SESAME to progressively disaggregate the data they report by manufacturing site and batch.
- The methodology discussed is essential for the effective functioning of CBAMs, which requires accurate product-level carbon accounting.
- As carbon accounting systems improve, companies may leverage emissions data to differentiate themselves in the market by promoting low-carbon products.
- Companies can protect proprietary emissions data while contributing to the broader carbon accounting goals by using secure, non-commercial platforms for data aggregation.

## Session 2: E-liability Pilot Updates

The second session highlighted real-world applications of the E-liability method, featuring three representatives from organizations that have piloted the E-liability approach: Chevron, Oxford University Hospitals NHS Trust, and IDG Security.

**Laura Kurt**, Lead Greenhouse Gas Specialist at Chevron described the development of its own carbon measurement system, known as the Statement of Greenhouse Gas Emissions (SGE). Chevron then partnered with the E-liability Institute on a liquefied natural gas (LNG) value chain project, which helped them extend the scope and accuracy of the SGE approach. Laura outlined Chevron's extensive value chain, starting from exploration activities, to the production of LNG, and eventually the shipping of LNG to customers. She delved into the complexities of accounting for emissions at various stages of the product's life cycle, including emissions from decommissioning the production facilities, allocation challenges, and offsetting.

Laura stressed the importance of using primary data, where possible, to ensure accurate carbon footprint calculations. The Chevron pilot demonstrated how secondary data often leads to inaccurate or inconsistent results, illustrating this with a plot comparing different facilities. Proper allocation methods have a critical role in emissions accounting, and Laura showed how different approaches lead to very different carbon footprints for the same product. Laura explained how the E-liability method challenged traditional materiality assessments, pushing for a more detailed evaluation of whether emissions sources were truly immaterial.

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**Wendy Cheeseman,** Head of Sustainability and Carbon Management at Oxford University Hospitals NHS, a leading research and teaching hospital in the UK, demonstrated the application of the E-liability framework to a high-volume healthcare treatment: hip replacements. The project created detailed process maps to capture all the emissions produced along a patient's complete cycle of care. The OUH project showed how reductions in direct energy use, travel, and anesthetic gasses could help the NHS achieve its net zero target.

Key insights included the unexpected sources of emissions such as staffing and energy use, the importance of collaboration across departments for effective data sharing, and the iterative process of refining their understanding of emissions through detailed analysis. She explained how the project revealed that staff commuting was one of the largest emission sources, even though it wasn't initially expected to be a major contributor. The project underscored the necessity for real-time data collection and the value of partnerships within the supply chain.

**Ian Gordon**, Founder and Chairman of IDG Security, discussed his company's efforts to measure carbon emissions while serving UN peacekeepers in Afghanistan. He compared the measurement of emissions to traditional financial measurements of costs. An unexpected discovery was that food consumption accounted for 38% of their IDG's CO2 emissions, a much higher share than anticipated. Ian concluded that even small companies operating in highly challenging environments can successfully apply the E-liability method. IDG's pilot experience is the subject of our latest HBR case study publication.

In the subsequent discussion, panelists emphasized the need for high-level organizational support, effective communication with supply-chain partners, and careful pilot design.

## Session 3: E-liability Proto-Standard and Closing Remarks

In the final session,  Karthik and **Lauren Holloway**, the Institute's Chief of Staff, shared progress on the Institute's work to develop a formal proto-standard for carbon accounting and auditing.

Lauren outlined the ten key principles of the proto standard, focusing on establishing a system for maintaining environmental ledgers that accurately reflect emissions. She emphasized the technical density of the document, encouraging careful review to grasp the outlined principles fully. The principles cover direct and upstream emissions, highlighting the critical importance of primary data and third-party verification to ensure the integrity of reported emissions.

The discussion also addressed challenges in collecting data from suppliers and the need for granular product-level data, proposing methods to incentivize the use of primary data. Furthermore, principles governing the allocation of emissions to products and services were discussed, stressing that emissions in must equal emissions out while ensuring that allocation decisions are logical and verifiable.

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Lastly, Karthik and Lauren introduced the concept of public ledgers for tracking emissions as they move through value chains, contributing to accountability for achieving net-zero targets. They also indicated plans to iterate on the proto standard based on feedback and develop additional standards related to E-assets and downstream emissions disclosure. Karthik concluded the presentation by stressing the importance of translating the proto standard into regulation, particularly in light of rising economic nationalism and growing interest in CBAMs, noting the need for a level playing field that encourages and rewards the cleanest producers globally.

This initial draft of an E-liability proto standard emerged from insights gained through the Institute's pilot implementations, in collaboration with a Technical Working Group composed of over 60 individuals. The proto standard is offered as a free global public good, encouraging widespread adoption and adaptation without requiring citation. Stakeholders are invited to email suggestions for improvement to protostandard@e-liability.institute before November 21st, 2024.

## *Overview of E-liability*

The E-liability carbon accounting method is an algorithm to accurately and cheaply calculate the embedded cradle-to-gate emissions of any product or service in the economy, in real time at the batch level. Just as organizations use cost-accounting systems to dynamically manage costs and quality in complex supply chains, they can use E-liability information to decarbonize their climate impact by rethinking their product design, operational, and purchasing decisions.
In essence, the E-liability algorithm aligns the high-level policy aspirations to combat climate change with ground-level market forces, so that individual decision-makers in value chains have relevant and reliable information to make actual decarbonizing decisions.