CCES 2025 Session Summary

Pathways to Net Zero: Linkages between Circular Economy & Climate Change

There is growing understanding that reaching net zero climate targets will require addressing the 45% of carbon emissions attributed to the production and use of products. Governments and businesses alike are beginning to acknowledge the opportunity, requiring carbon disclosure of suppliers both at an organizational and product level. This panel aims to synthesize the knowledge that a circular economy through its regenerative design reduces both upstream and downstream emissions.

Date / Location: Tuesday, April 15, 2025 / Montreal, Canada

Speakers:

- **Annie Levasseur**, Professeure, École de technologie supérieure - CERIEC (moderator)
- **Tom Rommens**, Materials Management & Circular Economy, VITO
- **Alasdair Hedger**, Senior Expert in Circular Economy Measurement & Reporting, Ellen MacArthur Foundation
- **Monique Lempers**, Chief Impact Officer, Fairphone (virtual)

SUMMARY

Speaker Presentations

Tom Rommens, VITO

Tom Rommens from VITO, a Belgian research organization focused on sustainable development, presented findings from work conducted for the European Environment Agency (EEA) on the climate change mitigation benefits of circular economy policies. He began by outlining the EEA's role in providing policymakers with timely and relevant information for sustainability policy development, leveraging a vast network of experts across Europe and beyond.

Tom addressed the central question of whether national energy and climate plans adequately reflect the potential of the circular economy to contribute to climate targets. His analysis of a large database of climate policies revealed a significant underrepresentation of circular economy measures, accounting for only 5% of the total. Alarmingly, 60% of these few measures were focused solely on waste management. While acknowledging the substantial emission reductions achieved in the waste sector through measures like landfill bans, Tom pointed out that this sector represents a small fraction of overall emissions, necessitating broader circular economy integration.

To illustrate the limited impact of solely focusing on recycling, Tom presented a modeling exercise. Increasing recycling rates from 40% to 70% in Europe yielded only a marginal additional 1% reduction in overall emissions compared to a scenario focused on reducing fossil fuel use. This highlighted the need to move beyond end-of-life solutions and embrace strategies that limit primary resource consumption.

Tom emphasized that the climate impact of circular economy measures varies significantly depending on the materials targeted. Focusing on reducing the consumption of high-emission materials like certain non-metallic minerals and biomass could yield considerably greater emission reductions compared to a general approach.

A core argument of Tom's presentation was the fundamental misalignment between the territorial focus of national climate plans and the consumption-based impacts of circular economy. National climate reports typically track emission reductions within a country's borders, failing to account for embedded emissions associated with imported and exported goods. This lack of consideration disincentivizes the adoption of circular economy strategies, as their climate benefits, often occurring outside national boundaries or within scope three emissions, are not adequately reflected in national reporting.

Tom concluded by advocating for a stepwise approach to better integrate circular economy into climate policies. This includes raising awareness of the interlinkages, identifying the most effective circular economy measures through analysis and modeling, incorporating these into national climate plans with specific targets, adapting regulatory frameworks to support circular economy practices, and establishing robust monitoring and learning mechanisms.

His key takeaway was that while the circular economy offers significant potential for climate mitigation through reduced material flows, its underrepresentation in current climate policies needs to be addressed through a more comprehensive and consumption-aware approach to emissions accounting and policy design.

Alasdair Hedger, Ellen MacArthur Foundation

Alasdair Hedger from the Ellen MacArthur Foundation discussed how current greenhouse gas (GHG) accounting methods, particularly the widely used GHG Protocol, inadvertently hinder the adoption and recognition of circular economy activities in corporate emissions reporting and target setting. He argued that this lack of accurate data prevents companies from demonstrating the business case for circular solutions, thereby slowing the transition to a circular economy and impeding the achievement of net-zero targets.

Alasdair highlighted that while the circular economy, based on the principles of eliminating waste and pollution, keeping materials in use, and regenerating nature, offers significant potential to reduce global emissions, the current accounting framework fails to capture these benefits effectively. He provided examples of how the GHG Protocol disincentivizes circular practices:

- **Firstly**, on durability, companies are required to report the entire future use-phase emissions of a product in the year of sale, penalizing durable products with longer lifespans compared to less durable alternatives. A washing machine lasting 20 years appears to have higher emissions in the year of sale than four washing machines lasting five years each, despite the durable option having a lower overall emissions profile.
- **Secondly**, regarding end-of-life, the GHG Protocol allows emissions from incineration to be reported as zero, regardless of energy recovery. This creates an uneven playing field where linear practices like incineration appear environmentally benign in accounting compared to circular strategies that keep products and materials in use.
- **Thirdly**, with rental models, a shift in ownership means emissions traditionally reported as scope three (value chain) can become scope one (direct emissions) for the company offering the rental service. This can negatively impact how financial institutions view these companies, as they primarily report on scope one and two emissions of their investments, potentially discouraging the adoption of resource-efficient rental business models.

Alasdair emphasized that these are just a few examples outlined in the Ellen MacArthur Foundation's report, "Improving Emissions Accounting to Accelerate the Circular Economy Transition." The report identifies five key areas needing improvement in the GHG Protocol standards: overall clarity and consistency in treating circular economy activities, guidance on reporting circular material inflows and sourcing, product use and durability, circular material outflows and end-of-life, and finance emissions.

The Ellen MacArthur Foundation is actively engaging with the GHG Protocol during its current update process to address these shortcomings. Alasdair urged organizations working on the circular economy transition to read and share their report, follow the GHG Protocol updates, participate in the public consultation in 2026, and continue to advocate for the crucial role of the circular economy in achieving climate targets. He also mentioned his involvement in the Scope 3 Technical Working Group of the GHG Protocol. His key message was the urgent need for a fair and accurate emissions reporting system that properly recognizes and incentivizes circular economy activities to unlock their full potential in tackling climate change.

Monique Lempers, Fairphone

Monique Lempers, Chief Impact Officer at Fairphone, presented Fairphone's commitment to a sustainable future and their goal to achieve net-zero emissions by 2045. She began by introducing Fairphone, which evolved from a campaign exposing conflict minerals in electronics to a tech company with a strong focus on impact. Fairphone's mission is to make electronics fairer by extending product lifecycles, rethinking materials, and transforming the supply chain.

Monique emphasized that Fairphone's core philosophy revolves around creating products that last, as the majority (around 80%) of a phone's footprint lies in its production. By doubling a phone's lifespan, its footprint can be nearly halved. This is why Fairphone designs its phones, like the Fairphone 5, with a modular design, making components easily repairable and replaceable, thus extending their usable life and reducing electronic waste. Data presented showed a significantly higher percentage of Fairphone devices remaining in use compared to the wider market, leading to substantial avoidance of CO2 emissions, freshwater use, and material extraction.

Fairphone has committed to reaching net-zero emissions by 2045, a goal that drives their strategy and actions. With over 99% of their footprint residing in scope three emissions (their value chain), Fairphone sets annual targets to reduce their impact. Key focus areas for the current year include increasing the use of renewable energy in the production of their devices (from final assembly to component manufacturing), improving logistics by prioritizing ocean shipments over airfreight, and lowering greenhouse gas emissions during the use phase by designing more energy-efficient devices. They also strategically expand in markets with higher renewable energy use. Obtaining accurate lifecycle assessment (LCA) data from suppliers is a crucial ongoing challenge.

Beyond their own operations, Fairphone actively advocates for broader system change to create a fairer market for sustainable electronics. This includes pushing for policies and actions that boost consumer demand for sustainable products through education and support for the right to repair.

They also advocate for stronger regulations promoting durability and supply chain diligence, incentivizing sustainable businesses through tax benefits, driving harmonized industry standards and certifications, and increasing supply chain transparency to ensure accountability. Fairphone themselves set an example by publishing a transparent report annually.

In conclusion, Monique stressed the urgency of action and expressed her belief that through collective commitment, a more sustainable and fair future for electronics and other sectors is achievable.

Audience Q&A

The question and answer session following the panel presentations addressed several key aspects of linking circular economy and climate action, highlighting challenges and potential solutions.

QUESTION 1 - Assumption Setting in GHG Impact Calculations: The first question concerned the assumptions made when calculating the GHG impact of circular economy models, particularly for startups in early stages. The questioner pointed out that the positive impact of models like packaging-as-a-service or rental services heavily depends on factors like return rates and damage rates. They sought guidance on systemic or recognized ways to establish realistic assumptions that resonate with consumers and accurately reflect climate impact.

- ➔ **Tom** acknowledged the lack of a fully standardized approach for modeling, especially for scenario building, at the company level. While international LCA standards (ISO) and guidance from the Greenhouse Gas Protocol exist, a consistent methodology for assumptions and scenario development is lacking. He noted that even in national energy and climate plans where circular economy is mentioned beyond waste management, only a small fraction demonstrate a genuine effort to calculate the actual GHG impact. This "Wild West" scenario makes it difficult to compare results and for customers to discern trustworthy information.
- ➔ **Alasdair** added that clarity on the measurement's purpose is crucial. Companies should define whether they aim to measure emissions reduction, material inflows, cost savings from circularity, or other relevant metrics to build a strong business case. He agreed that current GHG Protocol standards might not fully capture the benefits of circular actions.

QUESTION 2 - GHG Protocol Revisions and Corporate Complexity: A question from the chat asked if the proposed changes to the GHG Protocol would make reporting more complicated for corporations and if any pilot testing with companies had been conducted.

- ➔ **Alasdair** clarified that the goal of the GHG Protocol revisions is to provide *more* clarity and address existing vagueness and optional reporting, rather than increasing complexity. The intention is to make it easier for companies to understand and demonstrate the business case for circular economy activities.

QUESTION 3 - Applying a Stepwise Approach at the City Level: A representative from a city government inquired about applying the national-level stepwise approach to circular economy integration within city policies. They sought strategies for proactive action at the territorial level, possibly facilitated by higher-level guidance.

- ➔ **Tom** suggested extending the metrics used for monitoring progress beyond simple territorial emissions to include consumption-based emissions. He emphasized the need to track indicators related to reduced material consumption, product-as-a-service models, repair systems, and sufficiency concepts. He cited examples of regional authorities using a broader set of indicators to understand consumer behavior and its impact on their footprint. The aim is to encourage different consumption patterns, favoring higher-quality, longer-lasting products.

QUESTION 4 - Engaging Suppliers for Scope 3 Data: A question for Fairphone addressed the challenge of obtaining data for scope three emissions calculations, given Fairphone's reliance on a complex supply chain.

- ➔ **Monique** acknowledged this as a significant challenge, particularly with second-tier component suppliers. Fairphone employs a dedicated team working with their assembly manufacturers to engage suppliers, explain their mission and targets, and establish collaborative programs. While not always successful, they prioritize engagement with willing partners and try to motivate suppliers by highlighting the increasing demand for environmentally responsible practices. They also employ creative approaches to data acquisition.

QUESTION 5 - Disconnects in GHG Protocol and Circular Business Models: Another question explored further disconnects within the GHG Protocol that hinder the measurement of circular business model benefits, beyond the already discussed territorial focus.

- ➔ **Alasdair** elaborated that their published paper details several such disconnects, both upstream (purchased materials) and downstream (end-of-life). There's a lack of incentive in the accounting for keeping products in use; reuse doesn't necessarily equate to zero emissions, while landfilling sometimes does. The GHG Protocol's underlying assumption often seems to be a linear "cradle-to-grave" model, not fully capturing the cyclical nature of circular business models where "end-of-life" products re-enter the system. He also touched upon the complex and currently unregulated area of "avoided emissions," which are considered separate from emissions inventories but are relevant to the benefits of circularity.

QUESTION 6 - GHG Protocol's Response and the "Half of Global Emissions" Claim: A question asked about the GHG Protocol's response to incorporating circular economy models and sought clarification on the claim that transitioning to a circular economy can reduce global GHG emissions by half.

- ➔ **Alasdair** reiterated the GHG Protocol's responsiveness and their active engagement in the revision process, including feedback received on circular economy. Regarding the "half of global emissions" claim, he referenced the Ellen MacArthur Foundation's "Completing the Picture" paper, which cites data from 2019 indicating that roughly half of global emissions stem from production and consumption, aligning with findings from the International Resource Panel (linked to the IPCC). This highlights the significant potential of addressing material flows through a circular economy approach alongside the energy transition.

- ➔ **Tom** added a crucial distinction between corporate GHG Protocol reporting for sustainability reports and national climate reports for global climate goals. These are distinct accounting frameworks and cannot be directly aggregated. He shared an example of a leasing company seeking guidance within the GHG Protocol framework to account for the benefits of a refurbished electronics business line, highlighting the current lack of specific guidance on scope three emissions, product reuse, and emissions allocation in such circular business models. He noted the GHG Protocol's awareness of these gaps and ongoing efforts to address them, which are highly anticipated by businesses seeking to build new circular business models.

QUESTION 7 - Longevity vs. Efficiency Trade-offs: The final question addressed the nuance of longevity in product design, particularly concerning energy efficiency. The questioner pointed out that extending the lifespan of energy-intensive products like old appliances or vehicles might lead to higher overall emissions due to lower energy efficiency compared to newer models. They inquired if research or work had identified thresholds beyond which extending product life might be counterproductive.

- ➔ **Alasdair** acknowledged this as a very good question and highlighted the importance of data in making such decisions.
- ➔ **Tom** admitted not having a definitive answer and cited the lack of comprehensive data to simulate such trade-offs, especially for IT appliances. He noted that factors like software updates can significantly influence the practical lifespan of devices, even if the hardware remains functional. He also reflected on the shift in mindset from repair being the default to replacement being common, emphasizing the need to re-emphasize repair and reuse.
- ➔ **Monique** concurred, emphasizing the critical role of design in the circular economy. Designing products from the outset with consideration for durability, repairability, and end-of-life infrastructure is key. While acknowledging potential energy efficiency gains in newer electronics, she stated that for many consumer electronics, the production phase constitutes the largest part of the footprint, making lifespan extension the most impactful strategy for reducing overall environmental impact. This principle also applies to sectors like the automotive industry.