CARBON ACCOUNTING TECHNICAL WORKSHOP

Workshop Synthesis Report

Workshop Objective: *Propose a way forward for policies that rely on carbon intensity (CI) accounting of biobased products by providing recommendations for decision-makers for more consistent, transparent, evidence-based, carbon accounting methods that are practical and verifiable. Develop effective communication materials and strategies for the high-level meetings in October 2024.*

1. Problem statement

Improving clarity, consistency, consensus, and understanding of greenhouse gas (GHG) and carbon accounting methods is essential to enable investments in the mobilization of sustainable biomass supply chains and to build confidence among consumers and policy makers about availability of reliable and compliant feedstocks. Multiple programs and regulations determine the eligibility and value of bio-based feedstocks based largely on the calculated GHG emissions and carbon intensity of a product. Thus, it is important for the public and policy makers to understand the implications of different approaches to carbon accounting, as these influence investment and trade in biobased products.

The Carbon Accounting Workshop, held in conjunction with the G20 Energy Transition Working Group meetings in Belo Horizonte, Brazil, brought together seventy practitioners and experts to identify opportunities to build consensus on issues and standards for accounting, reporting, and verification of carbon intensity. The half-day workshop agenda included 15 brief presentations (see https://biofutureplatform.org/news/carbon-accounting-of-biofuels/) and constructive discussion sessions. The workshop exceeded expectations as the participants proposed that the workshop be extended, and a smaller group reconvened to continue working from 16:00-18:30. During that session, the participants reached consensus on a set of basic recommendations for policy makers to improve carbon and GHG accounting for biogenic production pathways as presented below.

2. Key issues identified and discussed

The workshop was organized around a series of expert presentations on Life Cycle Assessment (LCA) methods relevant to GHG and carbon accounting for biobased products, followed by discussion focusing on the following questions: (a) What are the most important challenges presented by different methodologies and approaches and what are proposed as solutions to overcome the challenges? (b) What methods and policy options best support consistent, transparent, evidence-based, carbon accounting that is practical for diverse nations and verifiable? And (c) What are suggested strategies for synthesizing recently available data, reports, and comparative case studies to support science-based carbon accounting methods for biofuels?

Highlights from the discussion among participants include:

- Of all components and variables that impact carbon intensity, indirect land-use change (ILUC) was identified as being the most problematic. ILUC analyses illustrate potential market-induced effects which vary depending on model assumptions and techniques. And because ILUC cannot be directly measured, policy-imposed ILUC factors cannot be scientifically verified or managed by biomass producers. It was argued that while quantitative ILUC values are problematic, the modelling can inform policy makers of potential effects. It was also argued that imposing significant and unverifiable ILUC emission factors can be counterproductive to transparency and to engaging stakeholders in performance-based incentive programs because ILUC factors can change frequently independent of any action that can be taken by biomass producers. And quantitative ILUC factors have not proven to support effective actions for reducing LUC GHG emissions.
- Application of credits (or not) for avoided emissions based on counterfactual scenarios, is another area that typically relies on modelling or projections that can vary greatly depending on assumptions and data sources applied for analysis.
- Representativeness of input data which can vary widely based on site-specific conditions, was another area identified. The use of default values and aggregated or averaged value for input data, or the lack of explicit analysis for each stage in a supply chain cycle, were also identified as problematic. For example, the use of average values for key variables across wide geospatial areas (when in fact such values vary with location) or “black box” modelling approaches that rely on simulations rather than available, representative empirical data, can lead to misrepresentation and bias in analyses.
- Different approaches for allocation of emissions among co-products were reviewed, concluding that acceptable methods exist but transparency and consistency are essential to provide comparable and useful information for decision makers.
- Different approaches to account for imbedded carbon in biogenic feedstocks are also problematic if they depend on subjective or poorly defined labels such as “waste,” “residues” or “regenerative practices” for assigning a value. This can introduce bias and distort markets, for example by creating incentives to produce more wastes to benefit from policies that provide the highest monetary incentives for supply chains that use “wastes”.
- Uncertainty is also introduced when analyses rely on counterfactual scenarios for (a) management of land systems, (b) the alternate use or disposition of any form of biomass; and (c) displacement or substitution of other products. Analyses based on verifiable baseline conditions, and the use of international standards to transparently document the calculations associated with counterfactual scenarios, can reduce uncertainties.

Special topic: What to do about ILUC? Three basic options to address ILUC concerns are in use today and summarized below.

1. Apply an ILUC factor based on modelling to supply chains that rely on land-based resources.
2. Use a risk-based approach to determine what is acceptable in terms of ILUC risk and measures to avoid high ILUC risk and incentivize reduction of ILUC risks.
3. Apply place-based analysis & monitoring to measure, understand, and verify effects of specific supply chains on land cover and environmental qualities.

The options haver distinct impacts on supporting more sustainable production and continual improvement in renewable biomass supply chains.

3. Recommendations to CEM members and G20 for more consistent, practical, and transparent carbon accounting

The statements below were prepared based on the initiative of the participants in the Carbon Accounting for Biofuels Technical Workshop, held in Belo Horizonte, Brazil, on 28 May, to develop consensus on specific recommendations to CEM and G20 for improving GHG and carbon accounting of biobased supply chains.

GHG accounting is an area of active international collaboration. Improvements in the consistency and comparability of GHG and carbon accounting methods can be furthered with G20 support for guidelines such as:

- ***GHG and carbon accounting rely on Lifecycle Assessment (LCA). Input data and methodology for LCAs must be transparent, evidence-based, and verifiable.***
- ***For LCA or other technical-economic assessment results to be comparable, consistent system boundaries must be applied.***
- ***International standards exist for quantifying the net greenhouse gas (GHG) emissions footprint of biofuels, and for assessing biofuel sustainability. Such standards recommend the use of "best available data,"[1] emphasizing that data must be representative of the system being assessed.***
- ***LCA methods are recognized as being robust with the notable exception of potential or induced effects such as indirect land-use change (ILUC). International collaborations are constantly improving the transparency and consistency of LCA methods including those associated with allocation, carbon removals, and carbon credits.***
- ***Quantitative ILUC values cannot be directly measured or scientifically verified.***
- ***Quantitative ILUC factors shall be avoided in GHG accounting as they have not been proven to provide consistent results across models or to support effective actions for reducing LUC GHG emissions.***
- ***Action is urgently needed to unlock innovation, investment and sustainable bioenergy production using performance-based mechanisms.***
- ***Performance-based mechanisms should rely on verifiable metrics that are technology-neutral and feedstock-agnostic.***
- ***The G20 must show leadership by promoting consistent political guidance for GHG accounting and to identify and share alternatives such as the ILUC risk-based approach, or direct measurements, that are more effective and broadly applicable for global implementation.***

[1] "Best available data" are defined in ASTM International Standard E3256 (2022) Relative Sustainability as follows: publicly accessible, credible sources that can be explicitly cited for replicable analyses that strive to represent local contexts and situations. The qualities of source data used in LCA should be documented. Additional guidance is available in ASTM E3256 for how to systematicallyt document data qualities.

4. Post-workshop reports

A new IEA report (Carbon Accounting for Sustainable Biofuels, 2024) is based in part on the workshop and documents which include elements of sustainability criteria that are based on standards with scientific consensus versus elements that create uncertainty in assessments. Workshop participants recommended that case studies be developed to document which approaches are more efficient in providing consistent and transparent carbon accounting results, and are most effective in fostering innovation, competition, continuous improvement and clean energy transitions in the long term.

It is valuable for governments to understand the implications of different approaches to carbon accounting and to apply the guidance provided in the consensus statement above to encourage good practices for LCA. Additional good practices may include:

- Apply international standards to document baseline data as a verifiable reference point of comparison and to ensure consistent use of environmental product declarations (EPDs)
- Require GHG and carbon accounting assessments to transparently document data sources and assumptions, with preferential use of primary data
- Include uncertainty factors especially when secondary data are employed.
- Avoid LCA system expansion and other factors that are NOT within the operational control of actors along the supply chain.

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Other notes from workshop discussions, below, are based on the workshop's "parking lot" for ideas and additional text and comments. These points were noted during the discussion of consensus statements, but there was insufficient time to discuss and reach full consensus on these and other ideas:

- G20 offers a political forum to help harmonize policies in a manner that supports fair comparison, market development, trade and rural investment. The G20 could play a key role to support collaborations to improve GHG accounting.
- Independent of precise quantification, there is value in being aware of potential or expected induced (indirect) effects.
- Potential indirect effects may be projected to be beneficial or harmful (or both) depending on the criteria considered, spatial and temporal scales, the input data, and modeling assumptions and techniques applied in each case.
- There is potential for distant (or indirect) effects that are verifiable and such effects should always be assessed transparently on a case-by-case basis and addressed appropriately to avoid or minimize harmful effects and maximize beneficial effects, whenever causal relationships are confirmed.

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