GREENHOUSE GAS PROTOCOL

Actions and Market Instruments Technical Working Group

In Person Workshop, Washington DC
Meeting # 1.10

GHG Protocol Secretariat team:
Ralf Pfitzner, David Rich, Kevin Kurkul

November 11-13, 2025

WORLD RESOURCES INSTITUTE

World Business Council for Sustainable Development

Welcome

Tuesday, November 11th

11:00 am – 12:30 pm

- Agenda
- Expectations
- Ice-breaker

GREENHOUSE GAS PROTOCOL

Our Objectives: Advance White Paper for ISB approval and public consultation

- Get to know each other better
- Create common understanding on key issues
- Understand and discuss sectoral examples and SBTi connections
- Refine Part 2 of White Paper - consolidate feedback
- Refine Part 3 of White Paper
  - Discuss and align on multi-statement reporting structure options
  - Align on calculation methodologies, (physical) traceability, residual emission factors
- Create common understanding of roadmap until year end and outlook for 2026

Your workshop team

GHG Protocol Secretariat

Ralf Pfitzner

David Rich

Kevin Kurkul

Lauren Barretto

Bryanna West

Co-facilitators from Deloitte

Cynthia Cummis

Bora Youn

Sam LaFuria

Adam Beam

Ethan Coyle

1)..

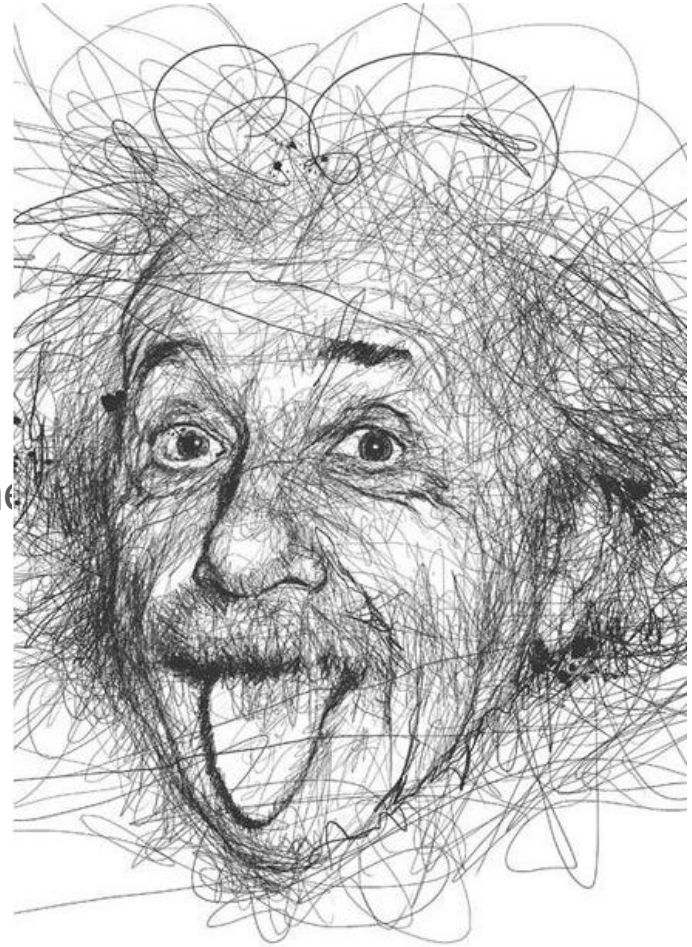
Introduction - who is in the room and online?

Please briefly introduce yourself:

- your name,
- your organization
- your role and
- one superpower, you bring to the TWG work for the meeting ☺

Icebreaker: You are all artists ☺

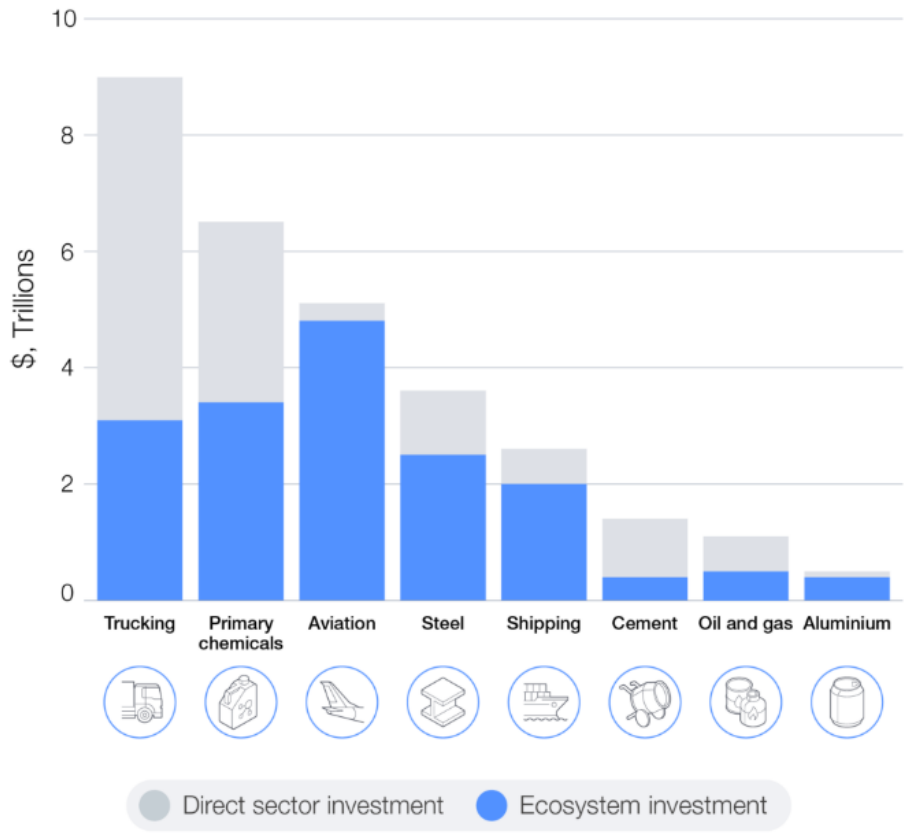
- People in the room:
- Take a sheet of paper, clipboards and a board marker
- Built pairs of two, standing opposite to each other
- Draw a portrait of your counterpart
- You have 2 minutes time for the portrait



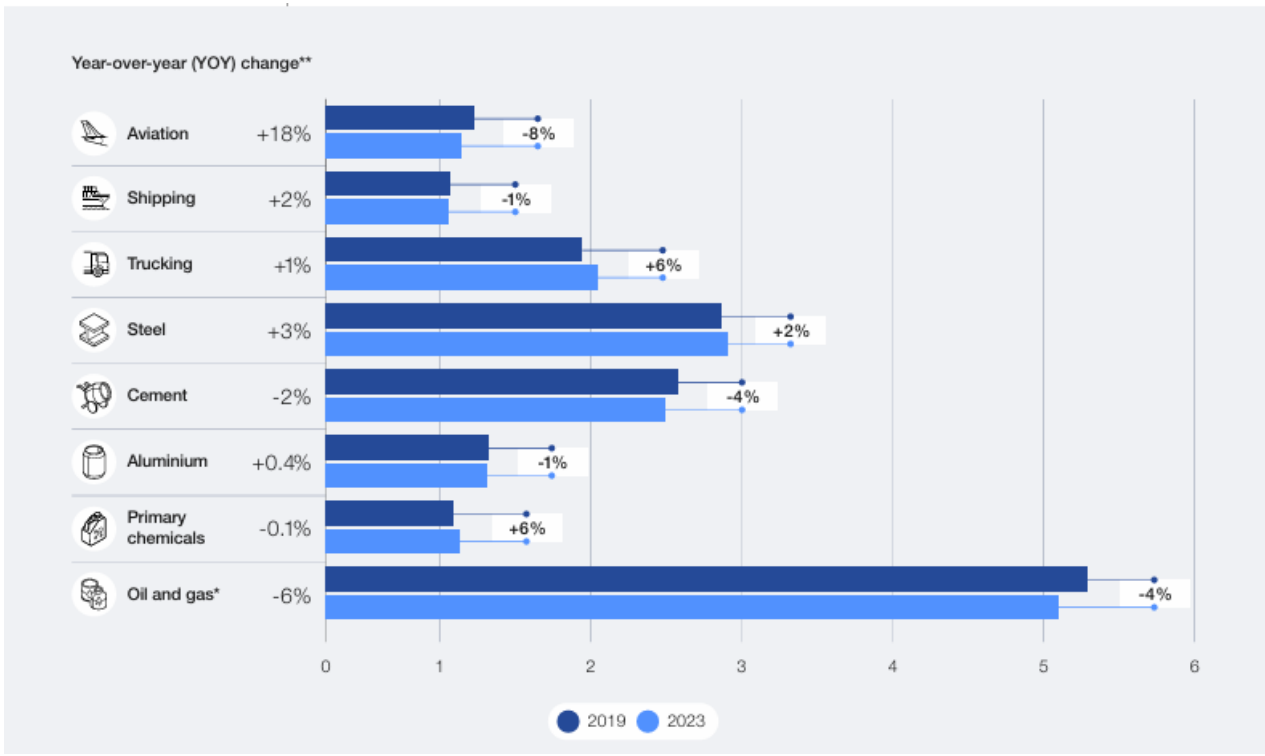
- People joining online:
- You have 5 minutes time to create/find something to put on your head
- The best "hat" will be rewarded

Recap (I) Why are we here? $30 trillion in additional investment are needed across eight hard to abate sectors to accelerate transformation

Additional decarbonization investment by sector and source, cumulative to 2050



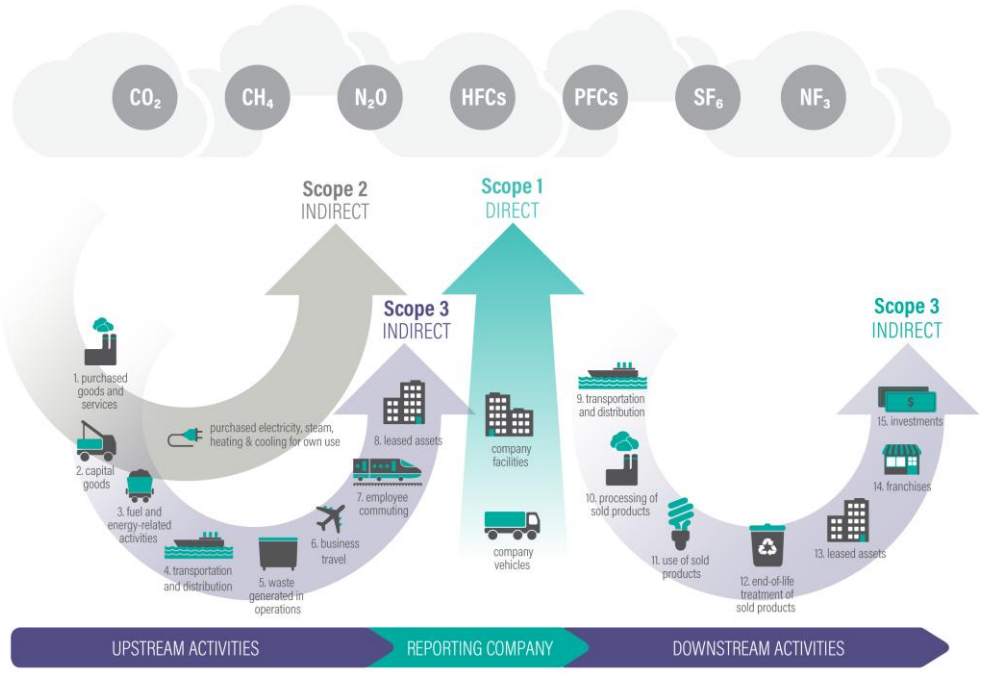
2019 vs 2023 absolute direct CO_2e emissions by sector in gigatons (Gt)[2]



1) Source: WEF/Accenture Hard-to-abate sectors must invest trillions to hit net zero | World Economic Forum; WEF Net zero industry tracker 2024. Net-Zero Industry Tracker 2024 | World Economic Forum
2) Notes: *Oil and gas data for 2018-2022 since 2023 data is not available; **YOY change represents 2023 vs. 2022 (except for oil and gas, which is 2022 vs. 2021). Sources: IEA and IAI.

Recap (II) – AMI to provide options to account for and report on corporate actions and market-based instruments, driving credible decarbonization

Current GHG Protocol standards with strong focus on physical inventory across Scope 1-3



New instruments and initiatives are out there

- New market-based approaches have been proposed for a **variety of applications and for several different sectors**, including natural gas/biomethane, aviation fuels (SAF), agricultural commodities, freight transport, maritime shipping, steel, aluminum, and others.
- These approaches include **value chain interventions** (e.g. supply shed), **project-based crediting** (e.g. offsets and insets), and **chain of custody models** (e.g. mass balance and book-and-claim).
- Market-based approaches have **typically arisen in cases where companies purchase** products or commodities **from common pools** or distribution systems and **direct contracting with suppliers or traceability to individual points of origin is not feasible**

1) Source

Our Agenda: Day 1

Time (EST)	**Topic**	**Format**	**Presenter**
11:00 am – 12:30 pm	Welcome & Agenda Ice-breaker, Expectations	Plenary	Secretariat
12:30 – 1:30	Lunch		
1:30 – 2:30	Align on White Paper sections 1-8 (focus on Part 2)	Plenary	Secretariat
2:30 – 2:45	Break		
2:45 – 5:00	Presentations of sectoral/practical examples by TWG members	Plenary (10 min presentation + 10 min discussion each)	TWG members
5:00 – 6:00	SBTi: latest updates on the SBTi Corporate Net-Zero Standard (relevant to AMI) and coordination/ alignment with AMI	Plenary (30 min presentation + 30 min discussion)	Giulia Camparsi
6:00	Joint dinner (Laos in Town)		

Our Agenda: Day 2

Time (EST)	**Topic**	**Format**	**Presenter**
9:00 – 10:30 am	Part 3 of the White Paper • Multi-statement reporting structure options • TWG feedback on section 9.1	Plenary	Secretariat
10:30 – 10:45	Break		
10:45 – 11:15	Scope 2 updates: market-based method	Plenary	Jessica Cohen (Constellation)
11:15-11:45	Scope 2 consequential methods public consultation	Plenary	Emma Konet (Tierraclimate)
11:45-12:15	Calculation methods	Plenary	Secretariat
12:15 – 1:00	Lunch		
1:00 – 2:15	Breakout • Residual emission factors • Traceability	Breakout groups	Breakout leads
2:15 – 2:45	Report back from breakout groups	Plenary	Breakout leads
2:45 – 3:00	Break		
3:00 – 3:30	Reporting statement options (main focus statements 2 and 3, applying GHG Protocol decision-making criteria) and intro to breakouts	Plenary	Secretariat
3:30 - 5:15	Reporting statement options (main focus statements 2 and 3, applying GHG Protocol decision-making criteria)	Breakout Groups	Breakout leads
5:15 – 6:00	Report back and discussion	Plenary	Breakout leads
6:00	Drinks and/or dinner		

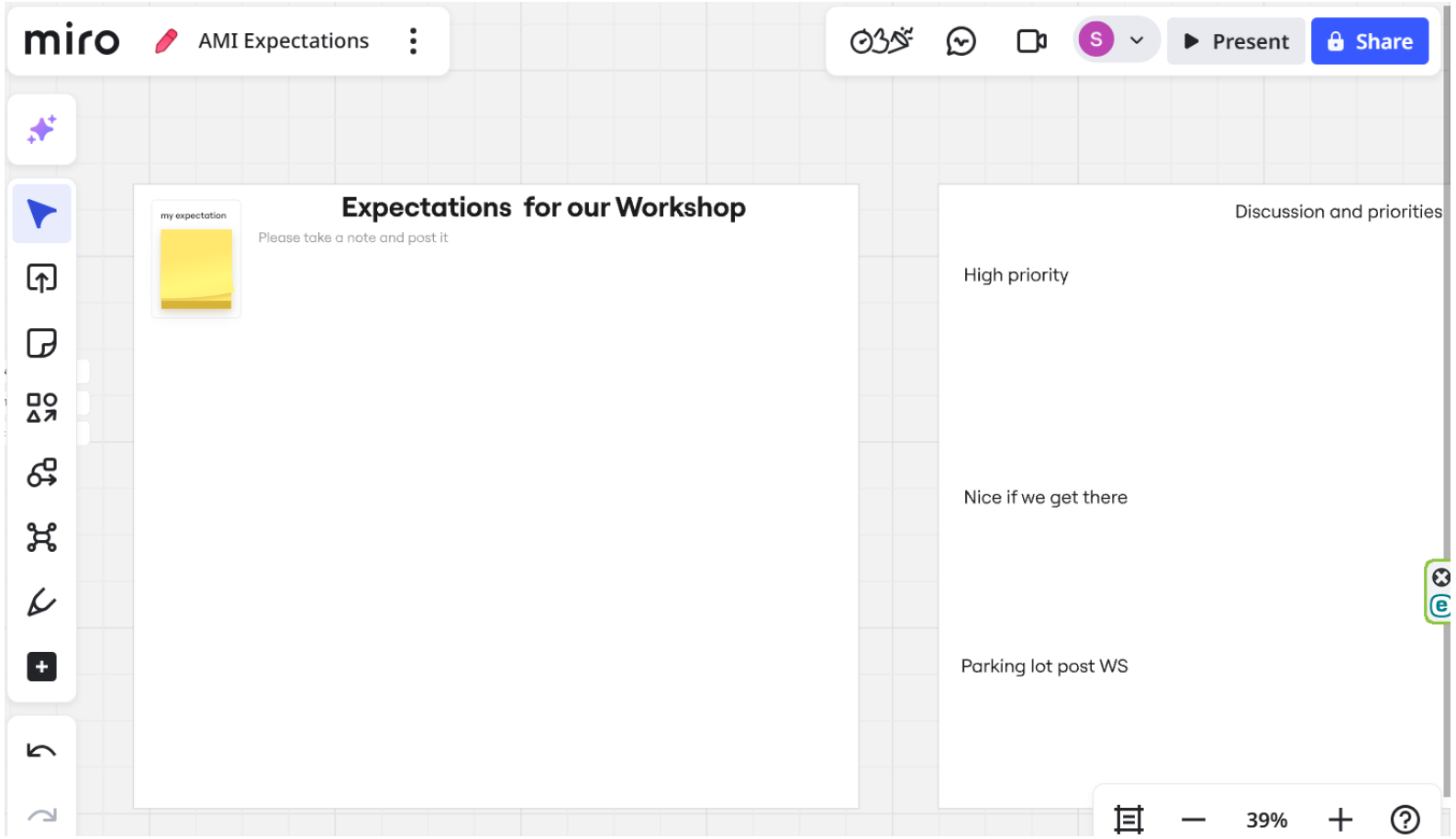
Our Agenda: Day 3

Time (EST)	**Topic**	**Format**	**Presenter**
9:00 – 9:30 am	Summary of Day Two	Plenary	Secretariat
9:30 – 10:30	Continue work on open topics from Day 2	Plenary or Breakout Groups	Secretariat
10:30 – 11:00	Break		
11:00 – 12:30	Value chain related GHG impacts (statement 3) and Beyond value chain GHG impacts (statement 4) – how and where to draw the line?	Plenary	Secretariat
12:30 – 1:30	Lunch		
1:30 – 1:45	Assign breakouts for WP text revisions	Plenary	Secretariat
1:45 – 3.00	• Revise and propose white paper text on tabled topics	Breakout	Breakout leads
3:00 – 4:00	Wrap up • Stock take on decisions made and remaining open questions • Identify key open questions to continue in 2026 • Assignment of follow up tasks for finalization of White Paper • Roadmap until year-end and outlook for 2026	Plenary	Secretariat
4:00 pm	Workshop concludes		

(Revised) Schedule for AMI Phase 1 White Paper and ISB review

Date	Responsible Party	Activity
Aug - Sep	*Secretariat*	*Draft white paper v1.0 (completed)*
Sep 24 – Oct 5	*TWG*	*Review first draft of white paper (completed)*
Oct 8	*TWG, Secretariat*	*Discuss white paper in Oct 8 TWG meeting (completed)*
Oct 9 – Nov 7	*Secretariat*	*Integrate TWG feedback to update white paper (completed)*
Nov 11 – 13	Secretariat, TWG	In-person TWG workshop to discuss key questions
Nov 17 – Dec 1	Secretariat, TWG	Secretariat synthesizes TWG workshop outcomes into revised white paper Poll TWG members on paper and/or key remaining questions. Introduce draft white paper to ISB at November 24 ISB meeting
Dec 1 - 12	ISB	Review of white paper (for ISB decision on Dec 15 ISB meeting)
Dec 15 - 19	ISB, Secretariat	If positive ISB decision, finalize/publish white paper in governance repository
Jan 2026	Secretariat / ISB	Prepare targeted public consultation, align key stakeholders and prepare sign off of public consultation materials by ISB
Feb-March 2026	Secretariat	Launch targeted public consultation

What do we need to achieve within the next three days to make you happy when leaving? Expectations....

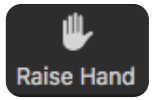


Online: please go to the Miro Board

In room: please use cards to write down your expectations

Housekeeping for our in-person/hybrid meeting

- There are participants in the room AND online – with equal speaking rights. We will have a "digital lead" per session who ensures all participants are heard
- One person speaks at a time, we do not interrupt others.
- Those online: Please use the Raise Hand function to speak during the call.



- Those in the room: Please raise your hand, too

- For every session, a moderator, a timekeeper and a notetaker are assigned.
- The moderator takes care that discussions do not derail.

- Please limit the use of mobile phones and computers for non-TWG topics during sessions to an absolute minimum.
- If you need to participate in other online meetings during the days, please let us know – we have an extra room/office space for that

Guidelines and Procedures

TWG members should **not disclose any confidential information** of their employers, related to products, contracts, strategy, financials, compliance, etc.

In TWG meetings, **Chatham House Rule** applies:

- "When a meeting, or part thereof, is held under the Chatham House Rule, participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed."

Compliance and integrity are key to maintaining the credibility of the GHG Protocol

- Specifically, all participants need to follow the **conflict-of-interest policy**
- **Anti-trust rules** have to be followed; please avoid any discussion of competitively sensitive topics*

* Such as pricing, discounts, resale, price maintenance or costs; bid strategies including bid rigging; group boycotts; allocation of customers or markets; output decisions; and future capacity additions or reductions

AMI TWG Shared Values

- Always **be respectful**
- Take space, make space
- There are **no bad ideas or questions**
- **Be pragmatic** – balance perfect with actionable
- **Be open** to differing points of view and **curious** about all sides of a discussion
- **Keep integrity** at the heart of decision-making and consider real word impacts
- **Keep focus** on the long-term goal of developing an effective standard

Rules of engagement for the workshop

- To ensure we have time to dedicate to all topics in our full workshop schedule, we will be using the following categories to prioritize and sequence topics:
  1. **White Paper edit requested** – a change is requested to existing text in the white paper to address a perceived factual error or mischaracterization
  2. **White Paper addition requested** – a change is requested to add additional text or options
  3. **Workshop parking lot** – identification of a topic which requires additional conversation beyond the currently-allotted time to resolve
     - To be revisited on day 2 or day 3, time permitting (some time is set aside on Day 3 of the workshop to return to tabled topics)
     - Parking lot topics not addressed in the workshop will be moved to phase 2
  4. **Phase 2 topic** – identification of a topic to be (further) addressed or resolved in phase 2 of the workstream
     - Phase 2 topics will be addressed starting in January
- The Secretariat will keep an active list of all topics identified in the categories above

White Paper Part 2

Tuesday, November 11th

1:30 – 2:30 pm

GREENHOUSE GAS PROTOCOL

WORLD RESOURCES INSTITUTE

World Business Council for Sustainable Development

Today's Objectives

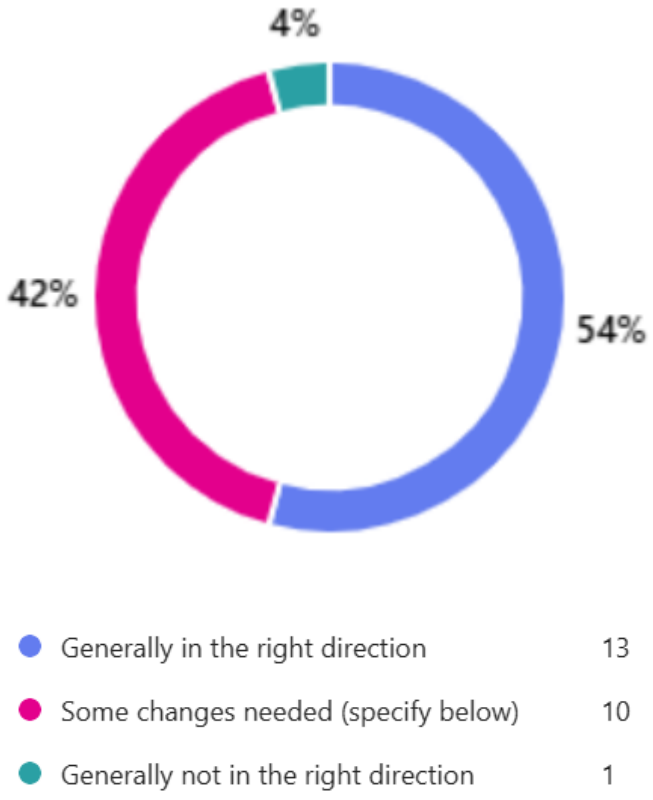
1. Review Secretariat changes based on TWG feedback on chapters 4, 5, 6, 7, and 8

2. Seek to finalize text for these chapters for submission to the ISB

AMI White Paper Outline and Steps

Section	TWG Review	Secretariat Edits	Workshop	Next Step (Nov 17 – Dec 1)
1. Introduction	N/A	N/A	N/A	N/A
2. Precedent in GHG Protocol standards	N/A	N/A	N/A	N/A
3. Need for multi-statement GHG reporting structure	N/A	N/A	N/A	N/A
4. Purpose, goals, and objectives	Complete	Complete	Review, conclude edits	N/A
5. Key concepts, terms and definitions for Actions and Market Instruments workstream	Complete	Complete	Review, conclude edits	N/A
6. Principles for GHG accounting and reporting	Complete	Complete	Review, conclude edits	N/A
7. Target setting and role of programs	Complete	Complete	Review, conclude edits	N/A
8. Possible statements	Complete	Complete	To discuss statement options. If TWG reaches agreement on statements, revise section 8. If TWG does not reach agreement on statements, discuss next steps (outlined on later slides).	Secretariat edits after workshop (based on workshop outcomes/discussion) if needed
9. Accounting and reporting specifications of each possible statement (Table 1)	Complete	Complete	To discuss and conclude edits	Secretariat edits after workshop if needed
9. Accounting and reporting specifications of each possible statement (Table 2 - 7)	Partial	N/A	To discuss select issues	Secretariat edits after work-shop and/or explain content is draft and subject to change

Feedback – Section 4: Purpose, goals, and objectives of the AMI Standard

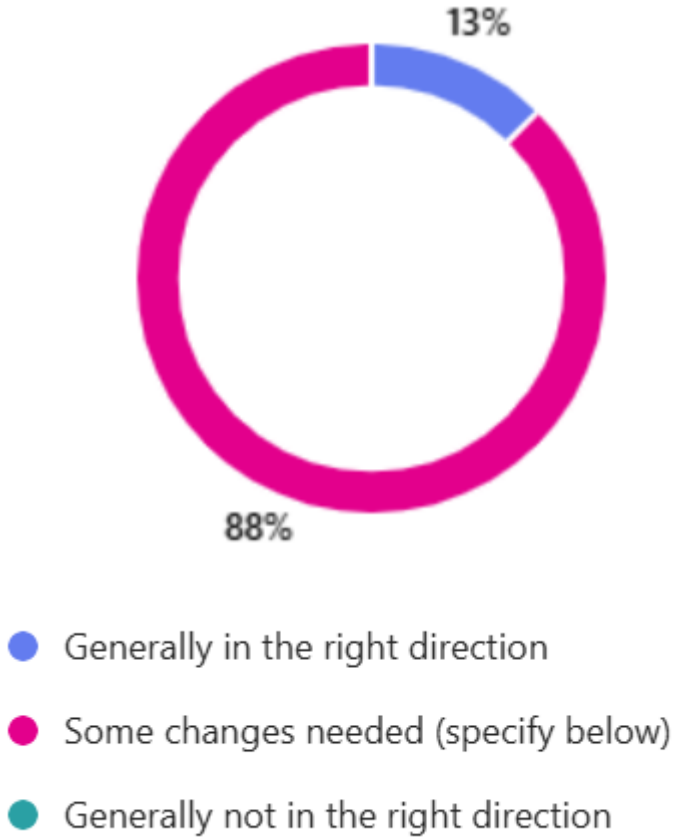


Edits to highlight:

- Clarify relation to target setting (include in scope companies that don't yet have targets)
- Clarify role of MI within physical inventory adjustment vs overall in other statements
- Strengthen role of /need for sectoral guidance
- Expand to other stakeholders beyond investors in one goals point
- Sync. language with SBTI (direct vs indirect mitigation)
- One questioning if AMI supports decarbonization

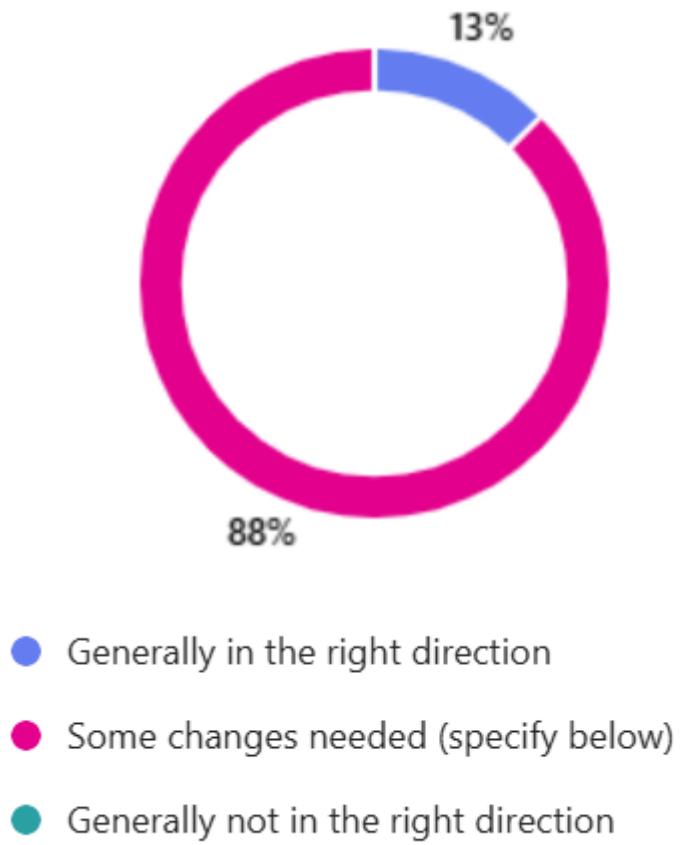
Section	Changes made
Purpose	• "Strengthening integrity of climate action" moved up • Cross sector standard as foundation for sectoral approaches
Goals	• "Support target setting and tracking progress" moved to goals • Enable stakeholders (…) to evaluate impacts and effectiveness of decarbonization efforts [not only investors] • Added: "incentivize companies and financiers to invest…"
Objectives	• Multi statement reporting emphasized

TWG Feedback – Section 5: Key concepts, terms and definitions for Actions and Market Instruments workstream (1/2)



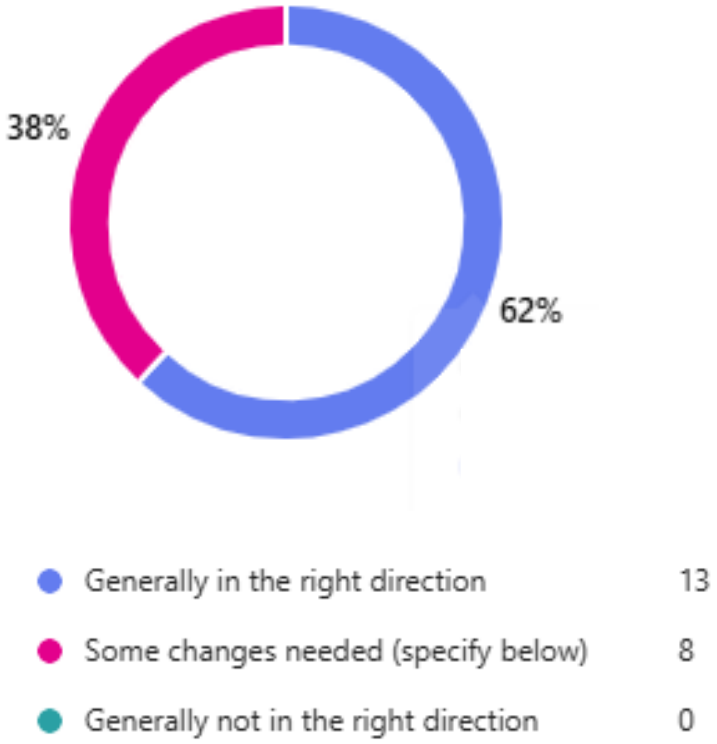
Section	Changes made
5.1 Actions and market instruments	• Added additional options for definitions of mitigation action, attributional accounting, consequential accounting from TCAT • Minor edits for clarification
5.2 Attributional and consequential accounting	
5.3 GHG report, statement, inventory	• Put forward single definitions of each term; moved definitions from other GHG Protocol standards and ISO standards to footnotes
5.4 GHG inventory terms	• Added additional terms and definitions from the Scope 3 Standard based on requests for additional terms to be added
5.5 Reporting structure related terms	• Edited to make 'accounting category' a type/subset of 'reporting element' • Added indicator term/definition from SBTi

TWG Feedback – Section 5: Key concepts, terms and definitions for Actions and Market Instruments workstream (2/2)



Section	Changes made
5.6 GHG impact related terms	• Added additional option for 'avoided emissions' definition • Added additional option for 'additionality' definition • Added GHG assessment boundary, ex-ante assessment, ex-post assessment
5.7 GHG crediting related terms	• Removed SBTi 'carbon credit' definition per feedback; kept ICVCM definition
5.8 Traceability related terms	• Added options for 'mass balance' definition from ISO 22095 and ISEAL 2025 • Added 'controlled mass balance' from ISEAL 2025 • Added options for 'book and claim' definition from ISO 22095 and ISEAL 2025
5.9 Target related terms	• Merged 'external compensation' and 'external compensation target' into one term/definition

TWG Feedback – Section 6: Principles for GHG accounting and reporting

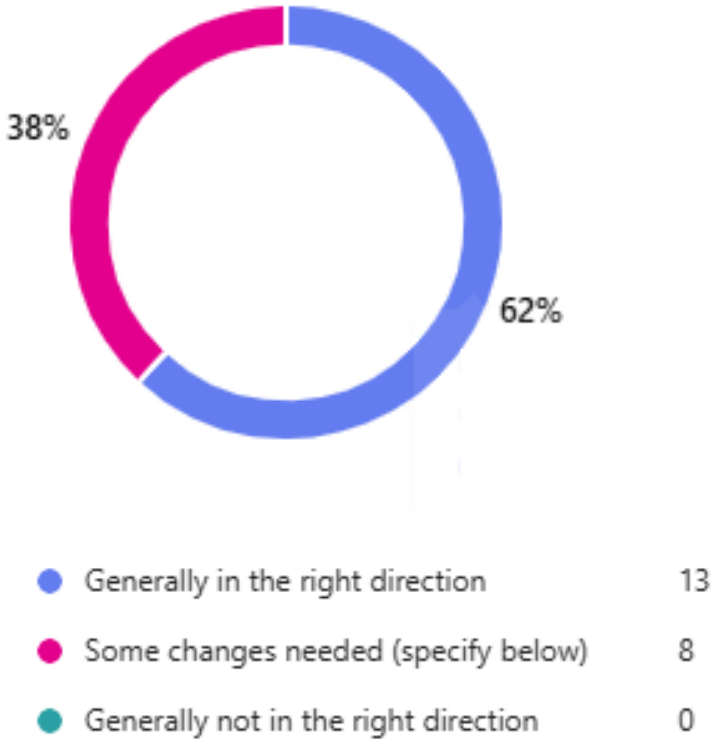


Edits to highlight:

- Maintain all of the principles
- Various additions and clarifications made (summarized below)
- More detailed topics added to the parking lot for phase 2 (i.e. how to operationalize principles)

Section	Changes made
6.1 Transparency	Clarifications made to text on need for disaggregated reporting without netting and role of target setting programs
6.2 Completeness	Clarifications made to positive and negative impacts language
6.3 Accuracy	Included connection with conservativeness: "Accuracy should be pursued as far as possible, but once uncertainty can no longer be practically reduced, conservative estimates should be used."
6.4 Conservativeness	Added additional guidance (aligned with other standards) to respond to questions received; added new provision to address how to implement conservativeness principle when quantifying base year or baseline scenario emissions

TWG Feedback – Section 6: Principles for GHG accounting and reporting

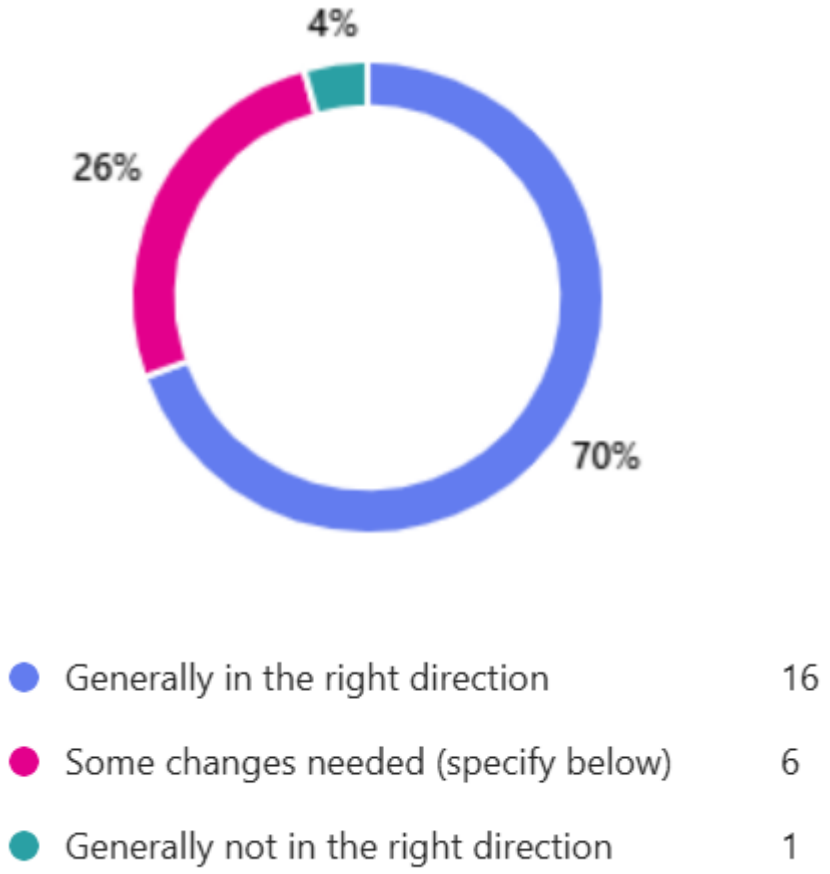


Edits to highlight:

- Maintain all of the principles
- Various additions and clarifications made (summarized below)
- More detailed topics added to the parking lot for phase 2 (i.e. how to operationalize principles)

Section	Changes made
6.5 Consistency (including comparability)	Added text on connection between consistency and comparability; added text on need for consistency and comparability between project and baseline scenarios when estimating impacts of actions
6.6 Relevance	No change
6.7 Permanence	No change; to discuss details of permanence in phase 2 and/or refer to programs
6.8 Principles or quality criteria for (credited) emission reductions or enhanced removals	Added references to UNFCCC Article 6 and ISO 14068; clarified permanence is for removals only

TWG Feedback – Section 7: Target setting and role of programs



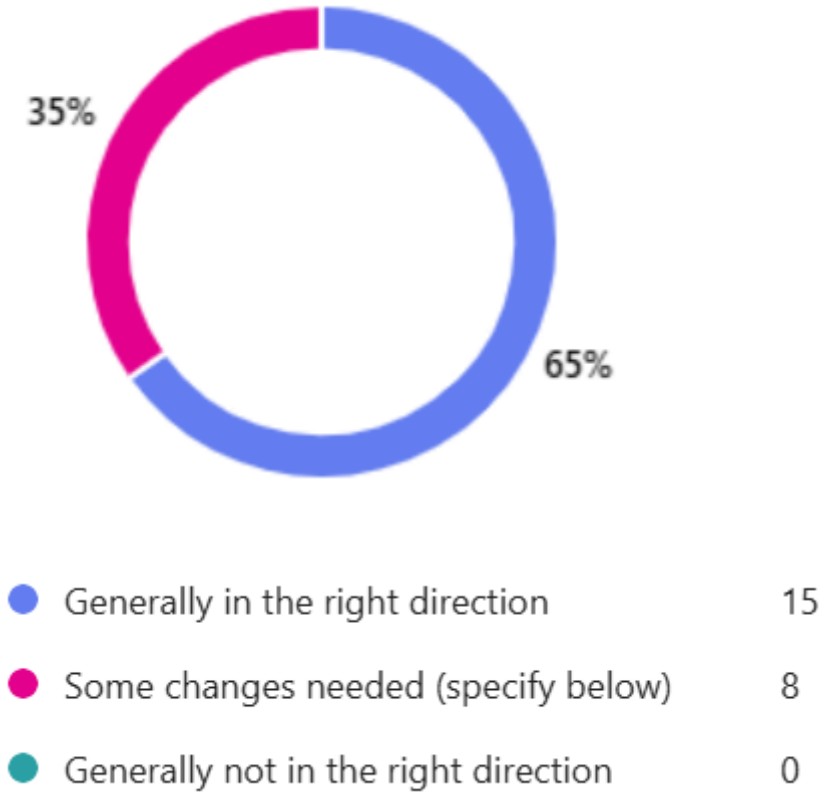
Edits to highlight:

- Clarification on the role of GHG Protocol and other GHG programs
- General text about the process for aligning with target setting programs added
- Specific box highlighting the preliminary alignment between concepts discussed and presented within AMI and SBTi CNZS v2.0 draft added
- Comments related to further exploring "policy neutrality" moved into topic list for phase 2

Section 7 addition: Relationship between SBTi target setting categories and potential GHG Protocol statements (draft, subject to change) (as of March 2025 SBTi CNZS v2.0 draft)

SBTi categories (March 2025 version of Corporate Net Zero Standard draft, v2.0)	GHG Protocol reporting statements being developed under AMI (Draft)	Land Sector and Removals Standard categories
Direct mitigation • Within the physical inventory • Within the value chain	Physical GHG inventory	Physical traceability
Indirect mitigation • Not in physical inventory • Mitigation actions that contribute to net-zero-aligned transformation relevant to the company's value chain but that cannot be traced back to activities or emissions sources within the company's value chain	New statement(s) 2 or 3 TBD (e.g. value chain related GHG impacts)	Impact traceability
Beyond value chain mitigation • Not in physical inventory • No association with the value chain	Beyond value chain GHG impacts	Beyond value chain mitigation
Indicators (non-emissions metrics)	Non-GHG metric transition indicators	Additional accounting categories (e.g. land occupation)

TWG Feedback – Section 8: Possible statements



Edits to highlight:

- Text added to further clarify that the statements presented represent categories of options rather than a comprehensive and unified proposal
- Text added to clarify the process and criteria for evaluating and deciding on a comprehensive framework

Sectoral Examples

Tuesday, November 11th

2:45 – 5:00 pm

GREENHOUSE GAS PROTOCOL

Today's Objectives

- Review relevant sectoral examples from TWG members to provide practical examples to ground TWG conversations throughout the workshop

- Topics to watch out for:
  - In which statement would the example likely be considered? / which options exist?
  - How are traceability issues dealt with?
  - Perspective of instrument provider vs reporting entity that uses the instrument

Smart Freight Centre

11/12 2025

Smart Freight Centre x Market Based Measures

November 12, 2025

What we do

Mobilize

Mobilize the global logistics eco-system, in particular our members and partners in tracking and reducing its GHG emissions to achieve 1.5 degrees pathways.

Track

Drive transparency and set the standard to simplify, increase efficiency and measure performance.

Reduce

To accelerate the reduction of logistics emissions by fostering collaboration, within the global logistics ecosystem.

Smart Freight Centre

SFC is growing with more than 200 members today

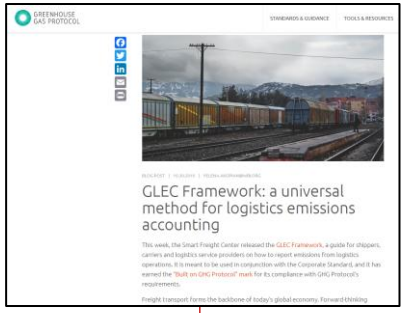
Smart Freight Centre

Chain of custody accounting in transportation

2013

2019

GLEC achieves "built on GHGP" status



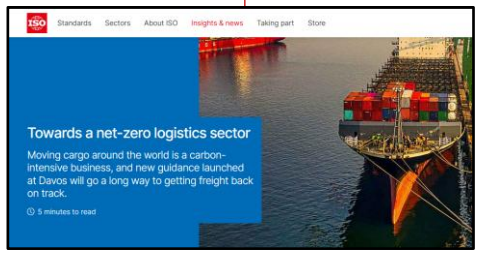
2020

"Insetting" White Paper

2021

MBM "Multimodal" Project Launch

2022

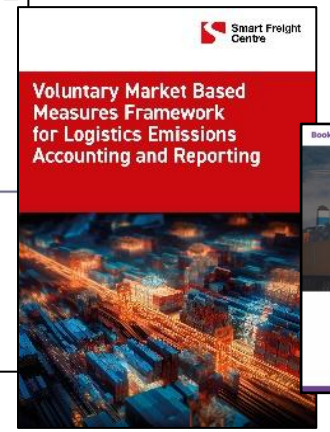


ISO 14083 developed on GLEC 2.0 fundamentals

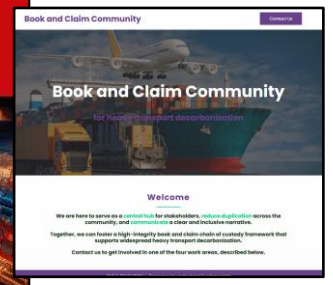
2023

SBTi-SFC Technical Partnership Announced

MBM Framework Published

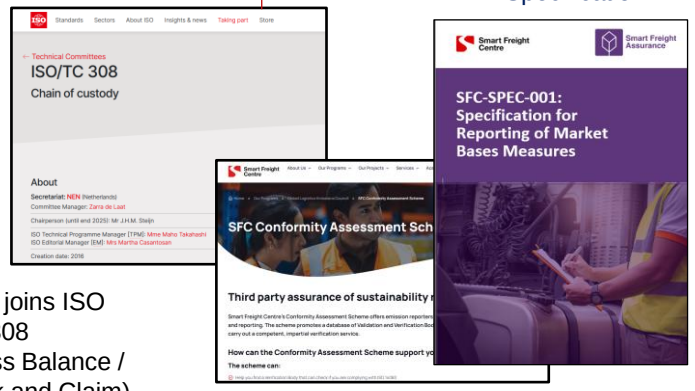


Book and Claim Community Launched



2024

Auditable Standard: MBM Specification



SFC joins ISO TC 308 (Mass Balance / Book and Claim)

GLEC Global Logistics Emissions Council

Smart Freight Centre

A Multimodal Book and Claim Framework

GOAL

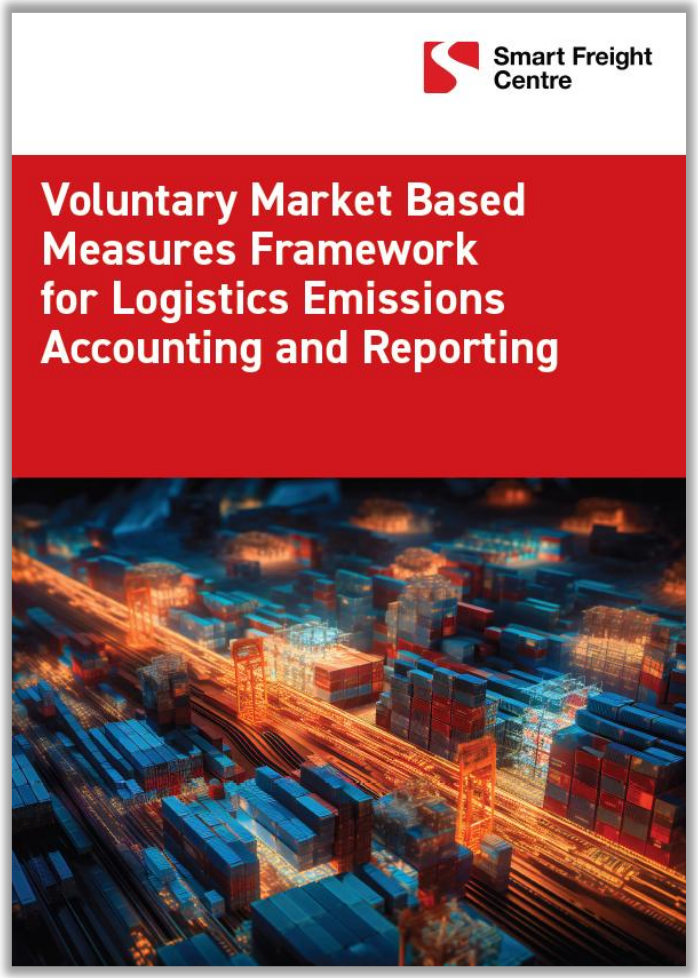
Support decarbonization of freight transportation supply chains by facilitating uptake of Low Emission Transportation Services (LETS) and Solutions (ie, fuels)

DELIVERABLE

‘Chain of custody’ accounting guidelines (including book and claim) for multimodal freight transport LETS, consistent with the GLEC Framework, ISO 14083, and GHGP/SBTi (to extent possible)

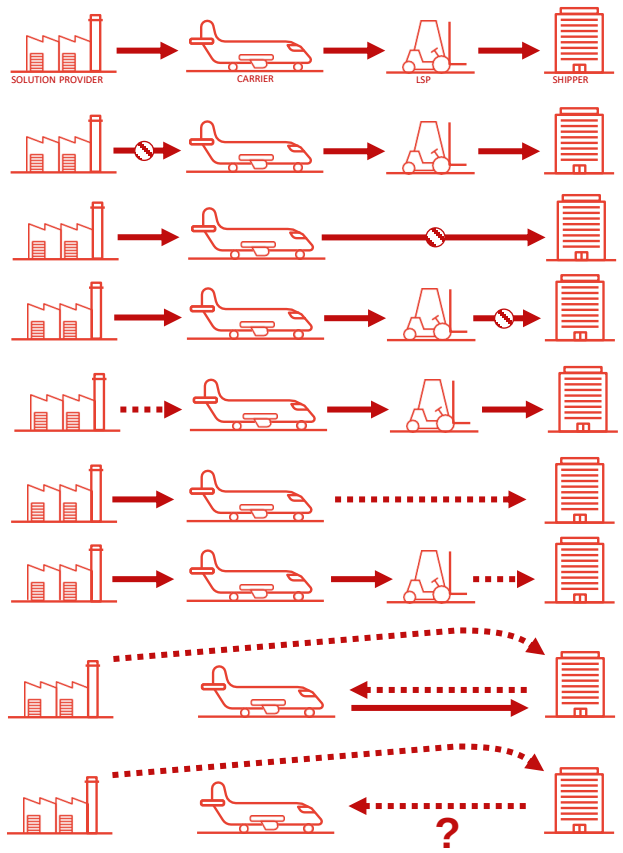
FUNDAMENTAL PRINCIPLES

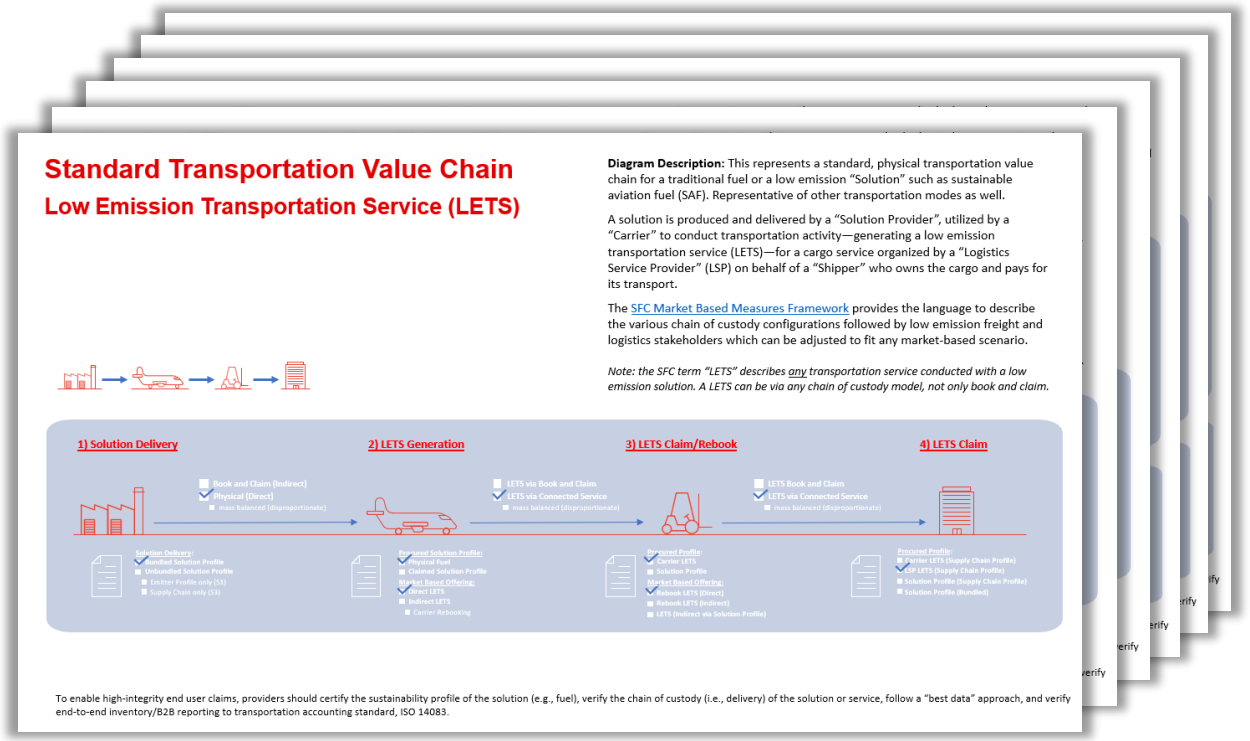
- Facilitate decarbonization in all modes
- Support uptake of LETS beyond regulatory requirements
- Avoid erroneous double counting
- Respect existing emissions accounting principles



Smart Freight Centre

Different models – Different starting points





Standard Transportation Value Chain

Low Emission Transportation Service (LETS)

Diagram Description: This represents a standard, physical transportation value chain for a traditional fuel or a low emission "Solution" such as sustainable aviation fuel (SAF). Representative of other transportation modes as well.

A solution is produced and delivered by a "Solution Provider", utilized by a "Carrier" to conduct transportation activity—generating a low emission transportation service (LETS)—for a cargo service organized by a "Logistics Service Provider" (LSP) on behalf of a "Shipper" who owns the cargo and pays for its transport.

The SFC Market Based Measures Framework provides the language to describe the various chain of custody configurations followed by low emission freight and logistics stakeholders which can be adjusted to fit any market-based scenario.

Note: the SFC term "LETS" describes any transportation service conducted with a low emission solution. A LETS can be via any chain of custody model, not only book and claim.

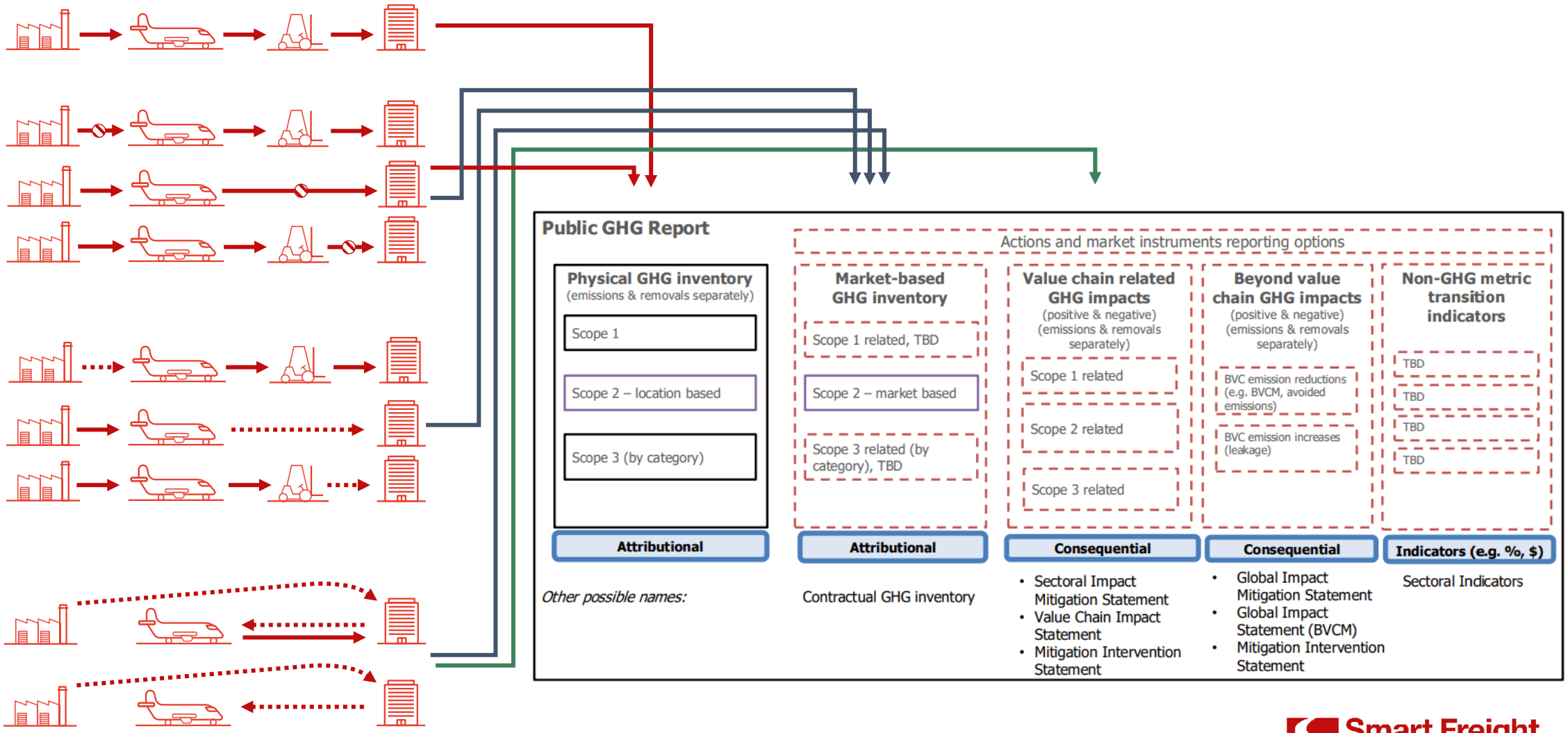
1) Solution Delivery | 2) LETS Generation | 3) LETS Claim/Rebook | 4) LETS Claim

To enable high-integrity end user claims, providers should certify the sustainability profile of the solution (e.g., fuel), verify the chain of custody (i.e., delivery) of the solution or service, follow a "best data" approach, and verify end-to-end inventory/B2B reporting to transportation accounting standard, ISO 14083.

Physical Mass-Balance Book and Claim

Smart Freight Centre

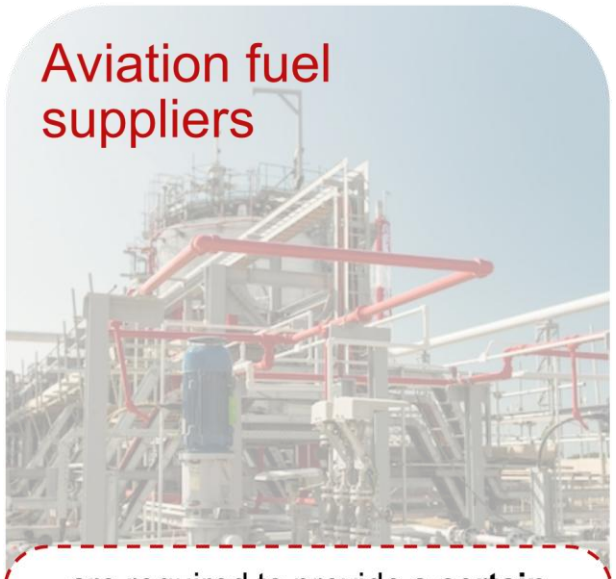
What could this mean for reporting?



Smart Freight Centre

But what about: ReFuel EU Aviation SAF Mandate

ReFuelEU Aviation is an **EU regulation** to promote the use of Sustainable Aviation Fuels. It mandates fuel providers to meet SAF blending targets at EU airports, **starting at 2% in 2025 and increasing to 70% by 2050**.



… are required to provide a **certain percentage** of their aviation fuel deployed at **Union Airports** as SAF, starting with **2% in 2025**, rising to 6% from 2030 and up to 70% in 2050.

… must uplift at least **90% of their annual aviation fuel required** for departures from a given Union airport directly at that airport. This is to avoid the practice of **tankering**, which leads to additional emissions.

… shall develop the appropriate **infrastructure** to store and refuel SAF. However, a **flexibilty mechanism** applies for the first 10 years.

Smart Freight Centre

The Book & Claim Community for heavy transportation

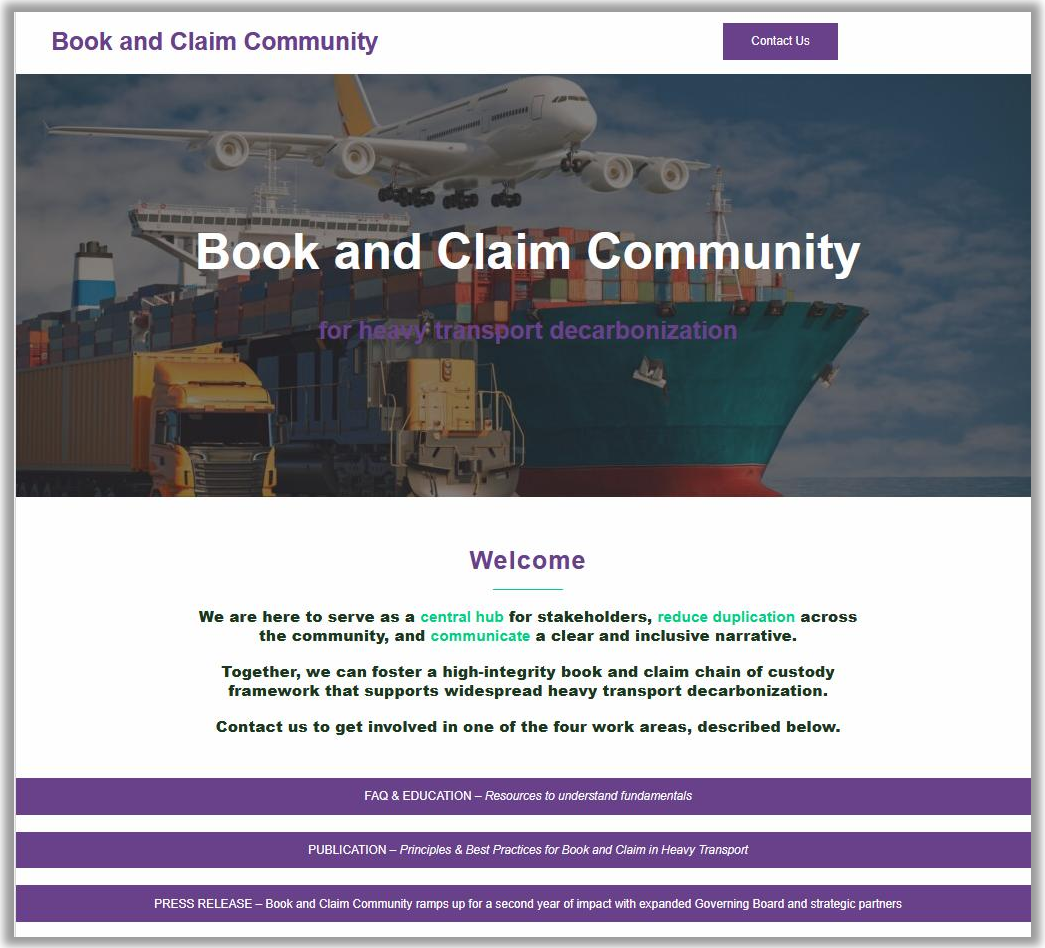
- www.bookandclaimcommunity.org

REPORTING AND TARGETS
Clarify and harmonize interim guidance, and facilitate consistent, coordinated engagement with GHG Protocol and SBTi

CERTIFICATION
Facilitate engagement with certification standard holders; pursue alignment across certification of compliance claims with book and claim accounting standards

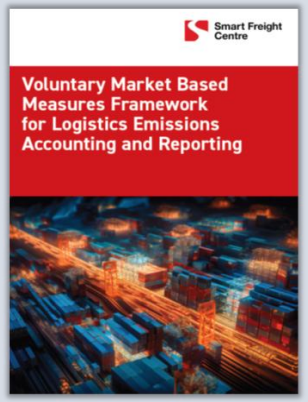
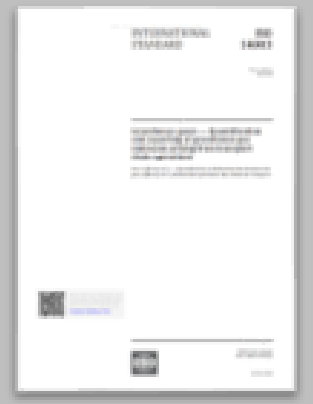
REGISTRIES AND RELATED APPLICATIONS
Facilitate coordination between registry and related software solution providers

CAPACITY BUILDING AND COMMUNICATION
Coordinate the development and implementation of capacity-building and communication strategies, including a summary of pilot approaches and outcomes




Smart Freight
Centre

Understanding guidance vs. normative documents

	Implementation	Verification
Emission accounting (CoC/MBM)	 **MBM Framework**	 **MBM Specification**
Emission accounting	 GLEC Framework	 ISO 14083:2023

Smart Freight Centre

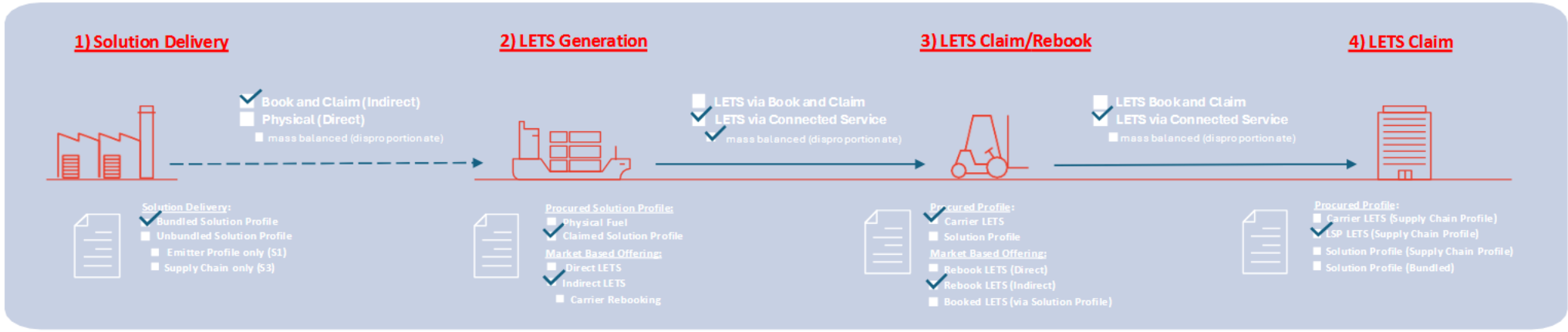
Accounting & Reporting Alignment

I report emissions from my cargo that…

…was on a *truck*, physically fueled with B100	…was moved by my carrier's *fleet* that physically fuels B100	…was moved by my carrier's fleet$_1$ but using the low emission attributes from *their other fleet*$_2$ that physically fuels with B100	…was moved by my carrier$_1$ who has coupled my service with *attributes from a different carrier's similar transportation activity*, where carrier$_2$ physically fuels B100	…was moved by my carrier$_1$ who used standard diesel and has coupled my service with *attributes from a solution provider* who produces B100	…was moved by my carrier who used standard diesel, and *I secured attributes of similar B100 carrier services from a registry*
					…was moved by my carrier who used standard diesel, and I procured B100 fuel *attributes from a solution provider via a registry* to calculate and report as if it had been on biodiesel
					…was moved by my carrier who used standard diesel, and I procured B100 fuel *attributes from a solution provider directly* as if it had been on biodiesel
					…was moved by my carrier who used standard diesel, and I procured B100 fuel *attributes and subtracted the total CO_2e "reduction" from my inventory*

MBM Case Study: Book and Claim-based Fuel Provision (Carrier LETS)

MBM Description: Carrier claims the low emission profile of a quantity of sustainable marine fuel (SMF) from a Solution Provider so they can generate an "indirect" low emission transportation services (LETS). This was ordered by a shipper, *ACME Industries*, organized by an LSP. Via market-based reporting, the carrier replaces their physical transportation fuel, fossil MGO, with the low emission profile of the SMF so the LSP and shipper can benefit from the lower supply chain emissions.



Milestone	Date
Solution Production:	Feb 3, 2024
Solution Booking Day:	May 21, 2024
S3 Emissions Inventory:	2024

Milestone	Date
Solution Claimed on:	Aug 25, 2024
LETS Generation:	Aug 27, 2024
LETS Booking:	Aug 31, 2024
S1 Applied to Transport Conducted on:	Sept 01, 2024

Milestone	Date
LETS/Solution Claimed on:	Sept 30, 2024
LETS Generation:	Sept 30, 2024
LETS Rebook:	Oct 05, 2024
S3 Applied to Transport Service on:	Oct 05, 2024

Milestone	Date
Profile Claimed on:	Oct 30, 2024
Profile Retired:	Oct 30, 2024
S3 Applied to Transport Conducted:	Oct 30, 2024

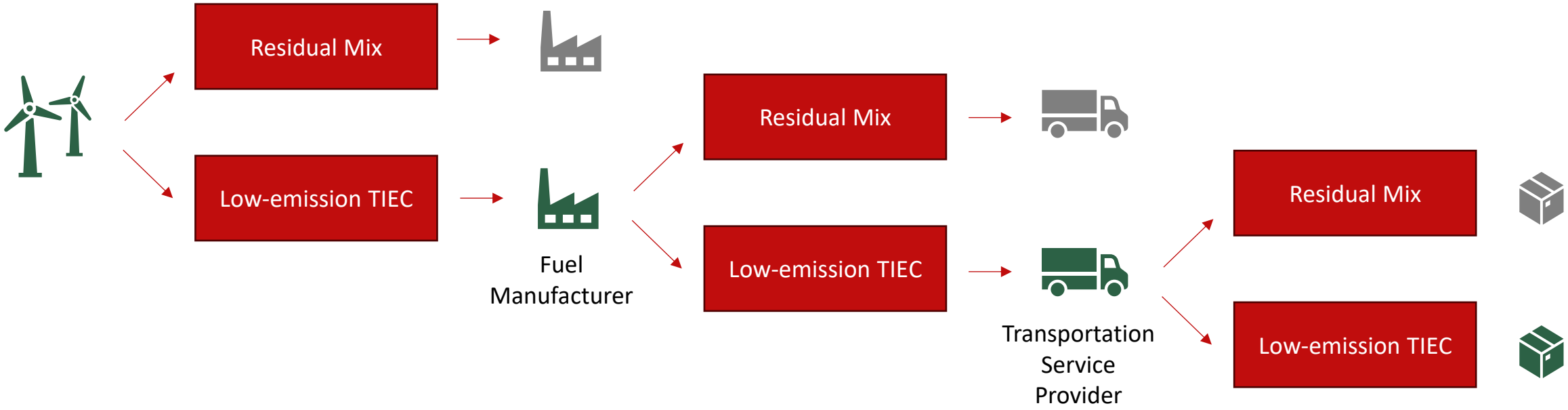
APPLICABLE REGULATION: SMF Producer's Tax Incentive (only)

REFERENCE CASE/COUNTERFACTUAL: MGO was the reference case for the Carrier, and the Solution provider mitigated double-counting risk by ensuring the physical recipient of the fuel reported as fossil MGO.

NOTES: Shipper's "environmental impact SOP" was taken into consideration when generating the LETS through the Carrier-LSP partnership, ensuring very clear additionality considerations (no gray area policies e.g. EU ETS), where the fuel was used within a preferred continental service area, and furthermore, the solution profile was derived from a "new" fuel producing facility.

Source: SFC MBM Framework Homepage

Concept Focus: Residual Mix



Accounting for chain of custody activities in GHG Inventories

Inventory accounting… …due to responsibility for… …activities and associated emissions:

Environmental sustainability	FY2023	FY2022	FY2021	FY2019 (Base Year)
GHG emissions by scope and source		Metric tonnes CO2e		
Scope 1 GHG emissions by source				
Fuel combustion in buildings	10,541	10,285	8,668	18,174
Vehicle fleet (internal combustion engine) [2]	26,417	32,418	24,009	43,727
Total Scope 1 emissions	**± 36,959**	**42,703**	**32,677**	**61,901**
Scope 2 GHG emissions by source				
Purchased electricity - buildings and fleet (market-based) [3]	11,969			
District heating and cooling	6,989			
Total Scope 2 emissions	**± 18,958**			
Scope 3 GHG emissions by source				
Business travel: air travel (tank-to-wake emissions) [5,6]	307,044			
Business travel: other sources	137,512			
Total business travel emissions	**444,556**			
Purchased goods & services (PG&S) [7]	1,107,612			
Total Scope 3 emissions [8]	**± 1,552,169**			
GHG emissions totals				
Gross GHG emissions	**± 1,608,085**			
Beyond value chain mitigation: carbon credit purchases [9]	859,083			

GHG EMISSIONS[1]

Million metric tons of CO_2e	2022 adjusted	2023	+/–%
Total logistics-related net GHG emissions	**36.59**	**33.27**	**–9.1**
Scope 1 net	**8.30**	**8.25**	**–0.6**
Scope 1 without market-based measures	8.30	8.26	–0.5
of which air transport	6.91	6.97	0.9
road transport	1.13	1.05	–7.1
buildings	0.26	0.24	–7.7
Reduction through market-based measures	> –0.01	–0.01	0.0
Scope 2 (market-based method)	**0.07**	**0.05**	**–28.6**
of which electricity (road transport and buildings)	0.04	0.02	–50.0
district heating and cooling (buildings)	0.03	0.03	0.0
Scope 3 (logistics-related) net	**28.22**	**24.97**	**–11.5**
Scope 3 (logistics-related) without market-based measures	28.27	25.09	–11.2
of which Category 3 – Fuel- and Energy-Related Activities	1.87	1.87	0.0
Category 4 – Upstream Transportation and Distribution	26.33	23.14	–12.1
Category 6 – Business Travel	0.07	0.08	14.3
Reduction through market-based measures	–0.05	–0.12	140.0

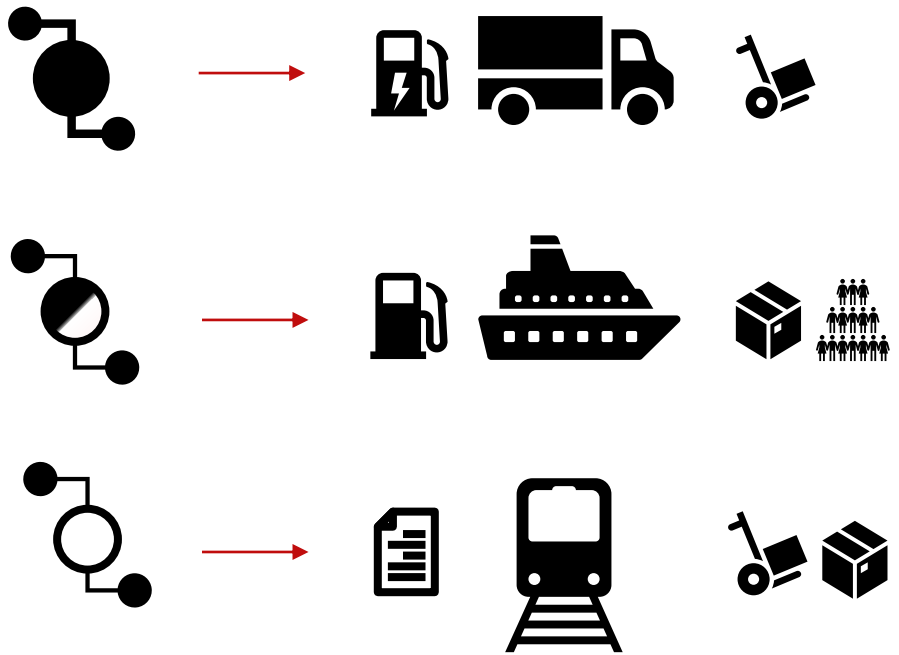
1.1 Greenhouse gas (GHG) emissions

Table 1A – GHG emissions by scope ($mtCO_2e$)

	FY20	FY21	FY22	FY23
Scope 1	118,100	123,704	139,413	**144,960**
Scope 2				
Location-based	4,328,916	5,010,667	6,381,250	**8,077,403**
Market-based	456,119	429,405	288,029	**393,134**
Subtotal emissions (Scope 1 + 2 market-based)	574,219	553,109	427,442	**538,094**
Scope 3[1]				
Category 1 – Purchased Goods & Services[2]	4,415,000	4,930,000	5,780,000	**5,564,000**
Category 2 – Capital Goods	2,962,000	4,179,000	4,026,000	**5,872,000**
Category 3 – Fuel- and Energy-Related Activities	300,000	350,000	450,000	**521,000**
Category 4 – Upstream Transportation[3]	243,000	225,000	371,000	**318,000**
	9,500	5,700	8,000	**8,000**
	329,356	21,901	139,000	**133,000**
	317,000	80,000	141,000	**187,000**
on	65,000	69,000	69,000	**69,000**
	2,983,000	3,950,000	5,101,000	**3,941,000**
icts	17,000	19,000	18,000	**4,000**
ts	11,800	9,600	8,000	**7,000**
	11,653,000	13,839,000	16,111,000	**16,624,000**
	12,227,000	14,392,000	16,538,000	**17,162,000**

($mtCO_2e$) with management's criteria

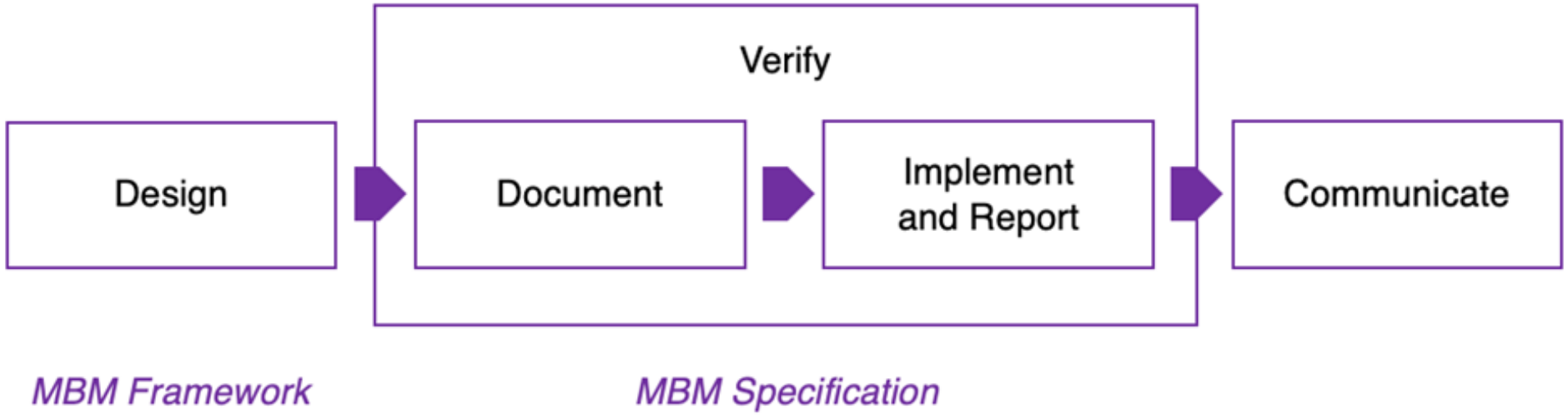
	FY20	FY21	FY22	FY23
	574,219	553,109	427,442	**538,094**
with SAFc	243,000	225,000	371,000	**305,000**
	385,000	23,000	157,000	**124,000**
	2,600,000	2,622,000	1,332,000	**2,158,000**
	8,097,000	9,642,000	10,500,000	**12,232,000**
	11,325,000	12,512,000	12,360,000	**14,819,000**
	11,899,000	13,065,000	12,787,000	**15,357,000**



The course aims to approve professionals who are already qualified under the SFC CAS -scope 14083 to carry out verification audits based on the *Market Based Measures Specification for Logistics Emissions Accounting and Reporting* (MBM Specification)

- 2 synchronous sessions of 3h. 2h of asynchronous homework.
- Free access to "Introduction to MBM" e-learning course from the SFC Academy (in addition to “Introduction to GLEC” e-learning, if desired for further work with accounting fundamentals).
- Homework is mandatory and will contribute to grade. Material shall be sent by email.
- Exam is necessary for qualification as an SFC approved verifier.
- Sessions recorded (exclusively for trainees and improvement), cameras on.
- Use of training materials restricted to your own company, pls respect copyright.
- Tailored approach—professionals are encouraged to bring their own cases to the training to increase applicability of the coursework.
- Interactive approach, feedback very welcome!

Implementing a high-quality & integrity MBM approach to transportation emissions accounting and, when applicable, bringing them to the market is an intentional process:



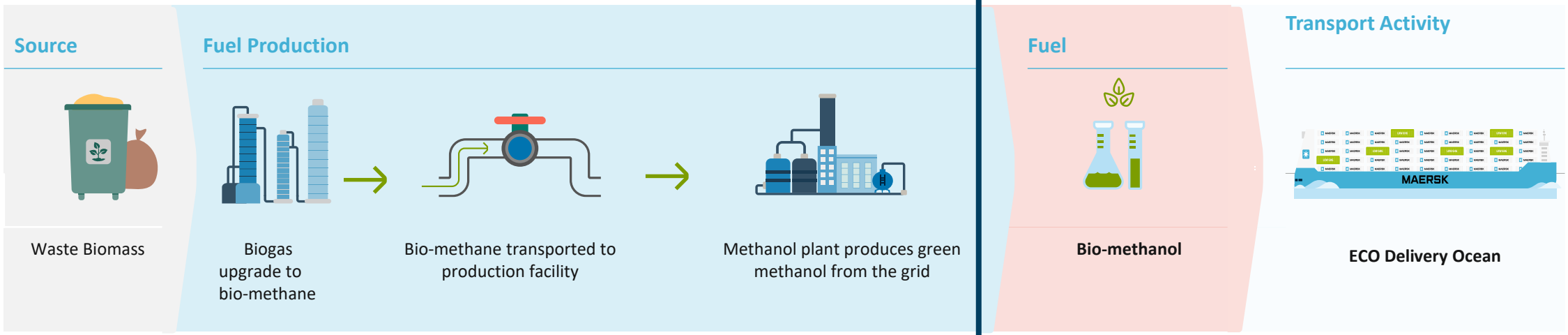
Maritime Examples for Market-Based Measures

MAERSK

ALL THE WAY

Chain of Custody: One Concept, Many Applications Across the Fuel Life Cycle

Focus for this session



Fuel production (materials)

- Physical Segregation
- Mass Balance
- Book & Claim

Fuel (materials)

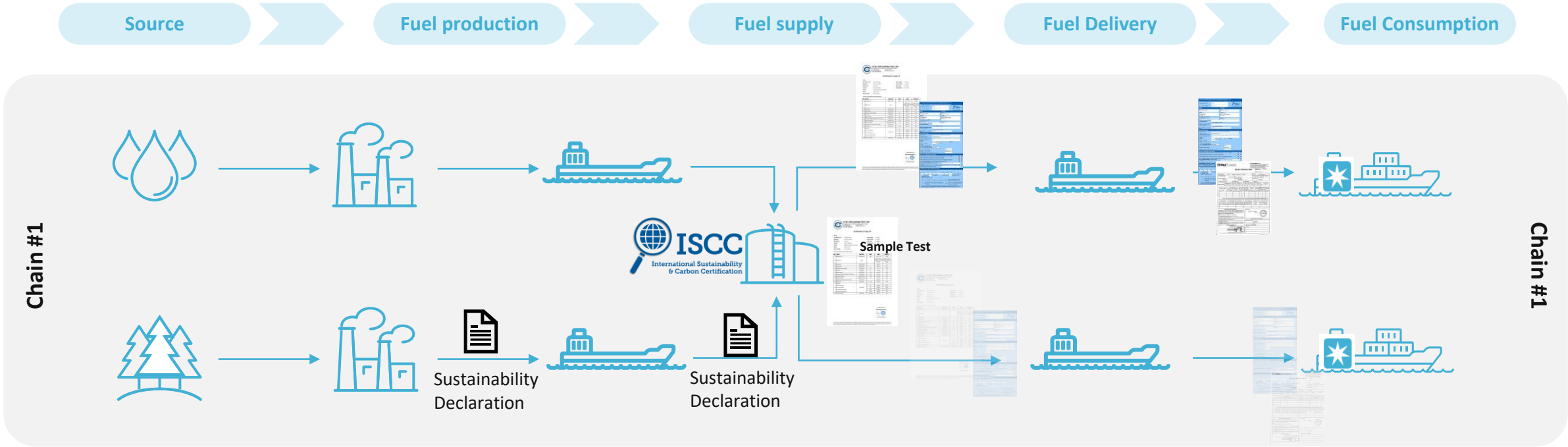
- Physical Segregation
- Mass Balance
- Book & Claim

Transport activity consisting of fuel and transport work (service)

- On-asset
- Mass balance
- Book & claim
- Offsetting

MAERSK

Currently, Maersk is only working with the concept of Mass Balance for fuel delivery, as it is accepted by regulations and the GHG protocol.



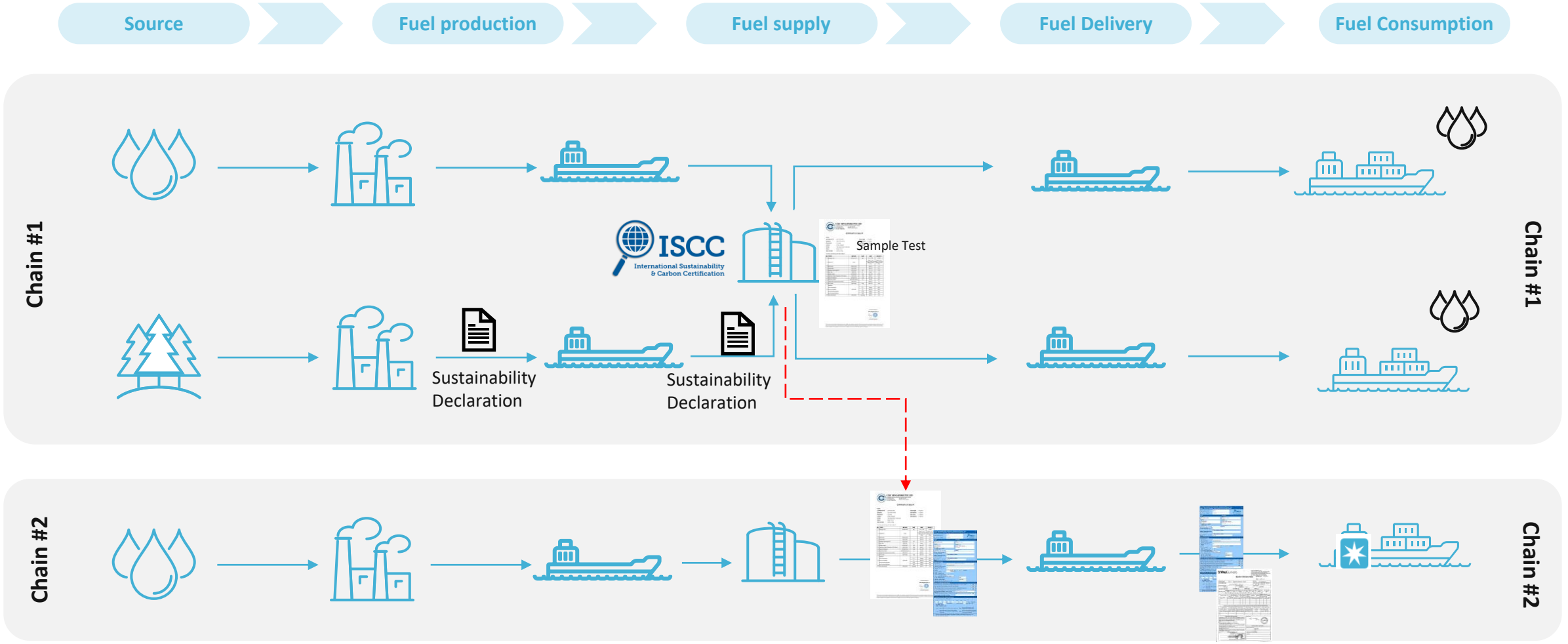
Certificate of Quality (CoQ):
- Sulphur Content
- Viscosity
- Density
- etc

Proof of Sustainability (PoS):
- Feedstock
- GHG WTT
- Feedstock Origin
- etc

Bunker Delivery Note (BDN):
- Blend Ratio
- Sulphur Content
- Viscosity
- Density

MAERSK

Conceptually, if Maersk was to apply a Book & Claim Chain of Custody, the documentation flow would be detached from the physical flow of the alternative fuel.

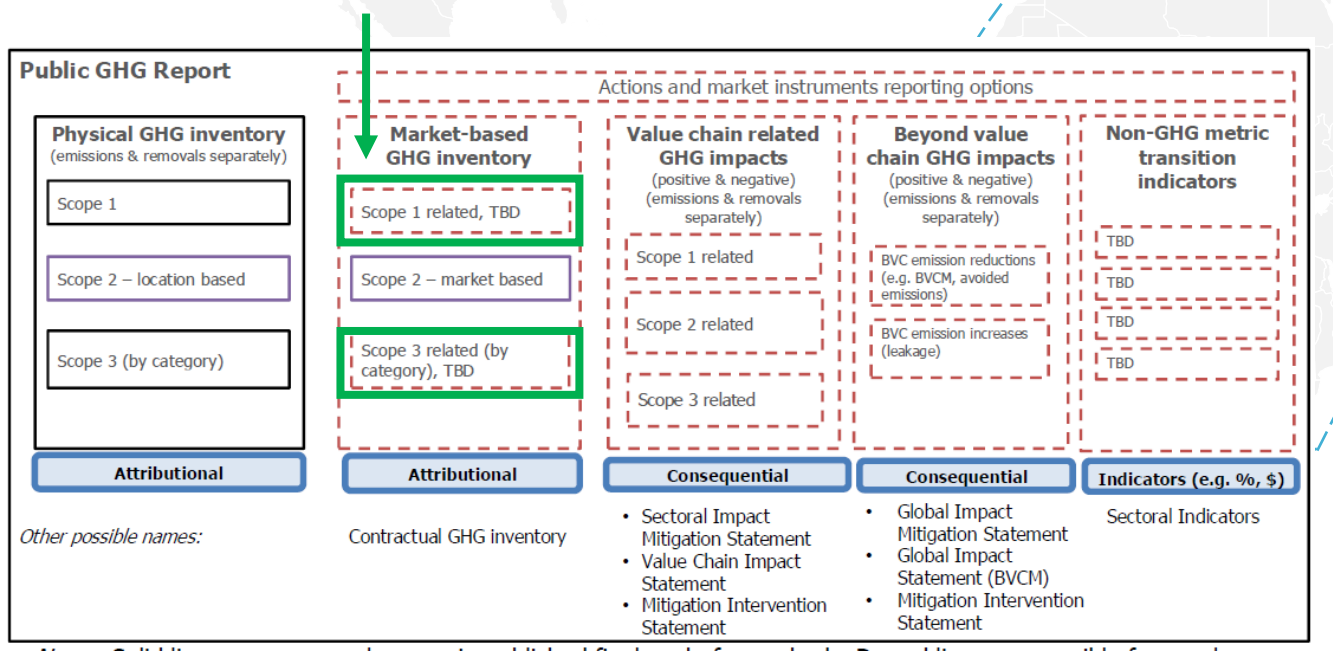


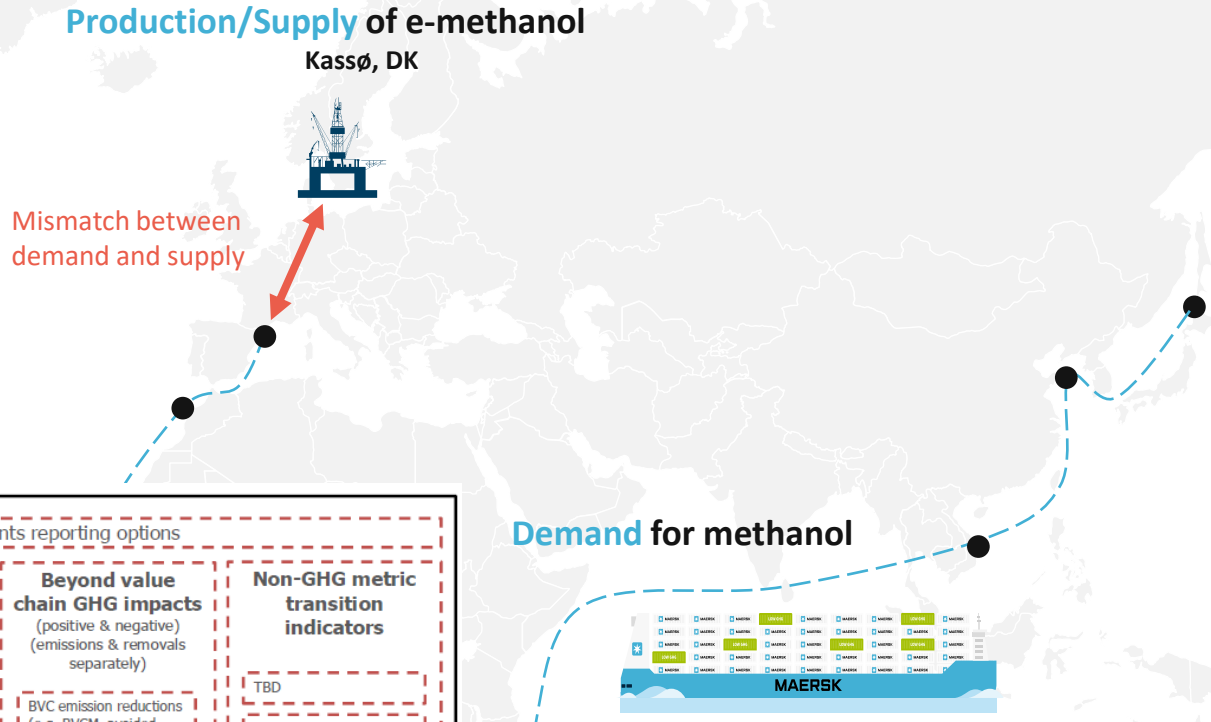
MAERSK

Maersk has heavily invested in methanol-enabled vessels and bio-/e-methanol production, however, faces a mismatch between network deployment and fuel infrastructure/supply

Solutions:

- Transport Methanol to Spain -> *High Transport Emissions*
- Change deployment of vessel to serve Danish ports -> Capacity Mismatch resulting in *higher transport emissions for containers*
- **B&C: Use grey methanol in Maersk vessel and e-methanol in other shipping company vessel and Book & Claim EAs**



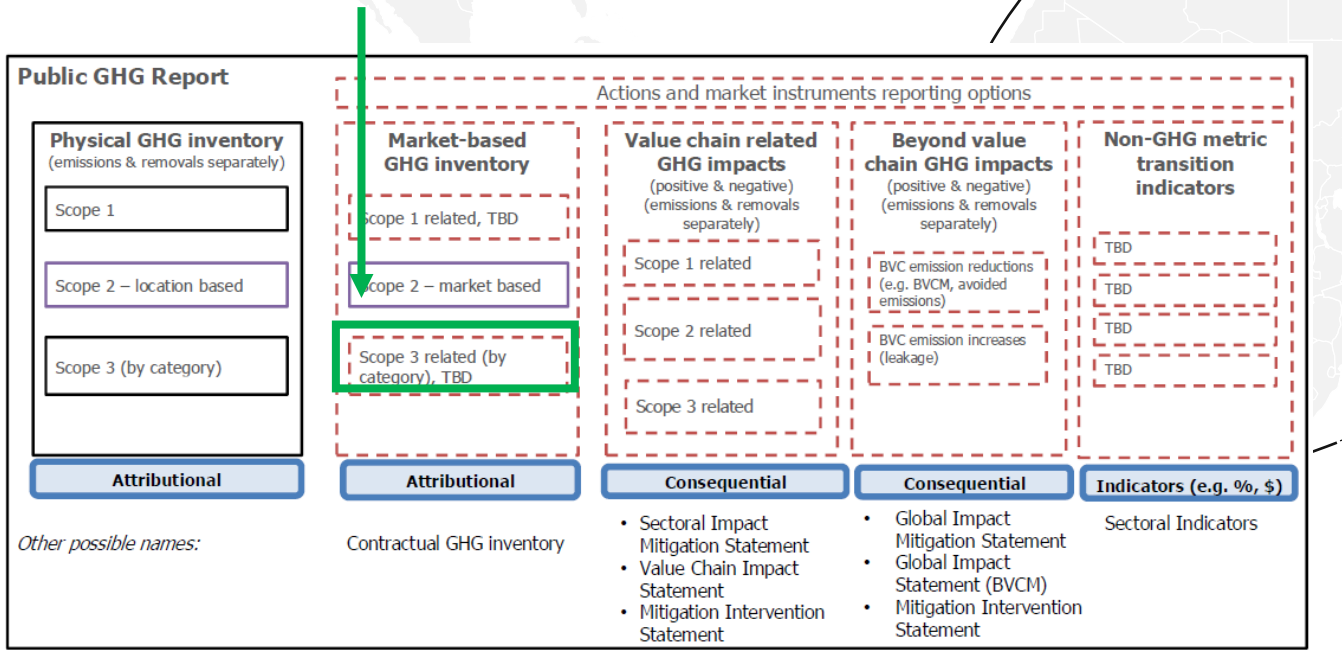


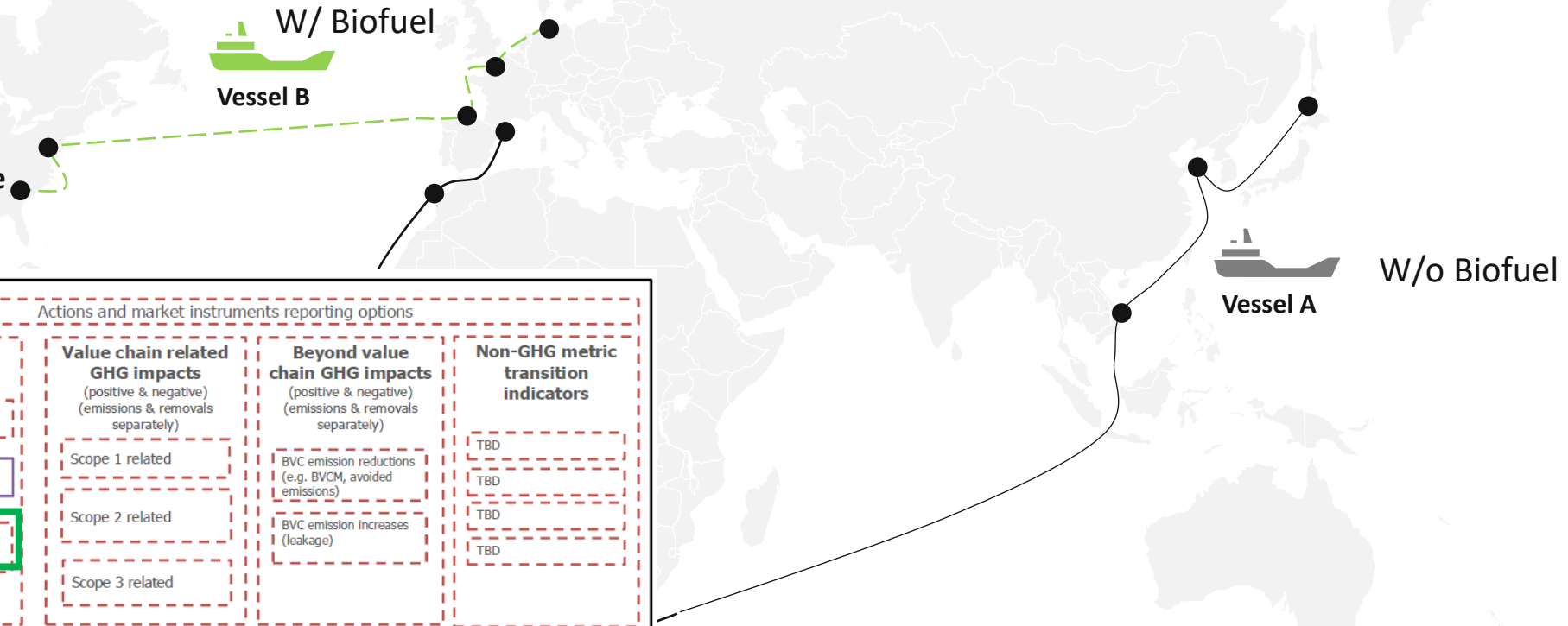
Transport Activity

With only limited alternative fuels available, Maersk currently allocates the environmental attributes detached from the actual transport of the customers

- Customer X usually ships containers between Asia –Europe on Vessel A
- It would like to buy transport on alternative fuel.
- Alternative fuel is burned between EU-US on Vessel B

ECO Delivery: Allocation of alternative fuel independent of the tradelane





Residual Mix for Maritime

Reporting of Fuel consumption:

- Fossil Fuel Consumption
- Alternative Fuel Consumption used for Regulation
- Alternative Fuel Consumption used for voluntary market is reported as fossil fuel

Clean Cargo

A Smart Freight Centre Partnership

MAERSK

ValueChange

Food and Ag example- leveraging Mult statement GHG reporting

Discussion in AMI TWG

November 11, 2025

Introducing Food and Ag example – commodity driven sourcing

In this example, several roasters source coffee from two adjacent supply sheds — one in Colombia (Supply Shed A) and one in Brazil (Supply Shed B).

Each roaster engages differently: some directly invest in low-emission interventions, some rely on certified supply chains, and others use market-based instruments like book-and-claim certificates.

Challenges include:

- Commodities are continuously mixed during aggregation and processing.
- Different actors use different traceability and impact tracking systems — some with certification, some with internal data, others with certificates detached from physical goods.
- Investments in mitigation occur at different points in time — often before or after the sourcing year.

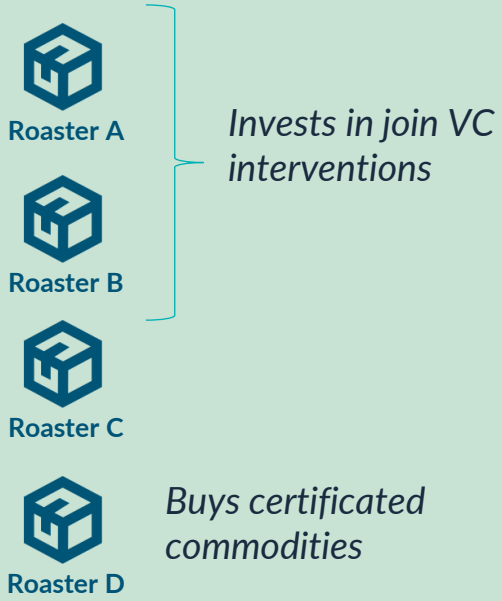
Illustrative example: buyer Actions in a Food and Agriculture value chain (1/2)

This example illustrates how buyers in a food and agriculture value chain can support mitigation actions through different approaches, and how these actions might be reported across inventories or statements.

In this scenario, **six coffee roasters each source 100 kg of green coffee**, operating across two adjacent supply sheds (sourcing regions) — Supply Shed A (Colombia) and Supply Shed B (Brazil). It is assumed that the Supply Sheds comply with Sourcing Region definition of forthcoming LSRS.

Supply Shed A – Colombia: Four roasters source their coffee from this region in reporting year X, but each takes a different approach to mitigation:

- Roaster A invests in interventions that cover 200% of its sourced volumes, effectively overcompensating for its supply.
- Roaster B invests in interventions covering 50% of its sourced volumes.
- Roaster C does not invest in any interventions.
- Roaster D purchases certified coffee using a segregation Chain of Custody (CoC) model, ensuring a direct physical link between sourcing and verified low-emission production.



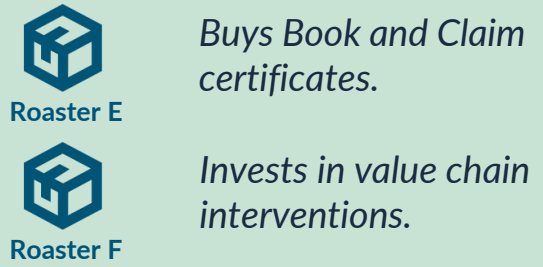
Illustrative example: buyer Actions in a Food and Agriculture value chain (2/2)

Supply Shed B – Brazil: Two additional roasters source from Supply Shed B, but each connects to Supply Shed A in different ways:

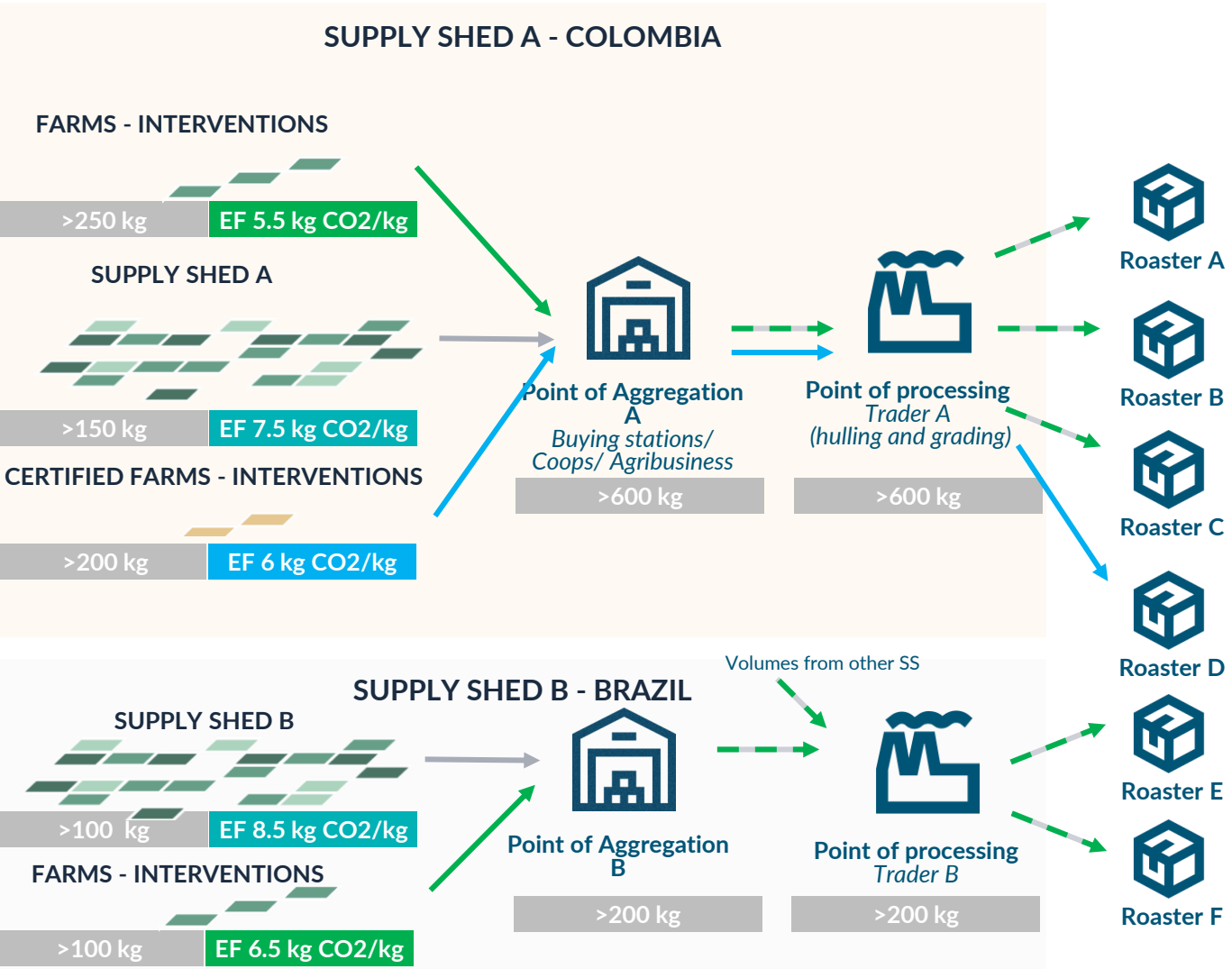
- Roaster E sources its coffee from Brazil but purchases Book-and-Claim certificates linked to mitigation activities in Supply Shed A (Colombia) — meaning the certificates are detached from physical goods.
- Roaster F sources mixed volumes, where physical traceability is broken, but invests in mitigation interventions within its own sourcing region (Supply Shed B) equivalent to its purchased volume.

Assumptions
Example assumes that there is a GHG Protocol compliant supply shed EF.

Illustrative numbers 1 kg of green coffee,
- Huila region in Colombia EF 7.5 kg CO2e/kg
- Producers with interventions for low-emission have an EF 5.5 kgCO2e/kg
- Certified farms with improved practices EF 6 kgCO2e/kg
- Brazil EF 8.5 kgCO2e/kg
- Global EF 12 kgCO2e/kg



Example in a coffee value chain



What they do?	GHG reporting in Year X					
	Physical inventory		MB statement		Actions statement	
	Sourced kg	Emissions CO2e/kg	Contracted kg	Emissions CO2e/kg	(Equivalent kg)	Emissions CO2e/kg
Invest in interventions for 200% of volumes and has SS traceability	SS A - 100	750	100	550 A CA	100	-550 C CA
Invest in interventions for 50% of volumes and has SS traceability	SS A- 100	750	50	225 A CA		
Nothing and has SS traceability	SS A – 100	750				
100% certified volumes segregated/traceable	SS A – 100	600 A CC				
Bought B&C certificates and and SS traceability	SS B – 100	850			0	-600 C CC
Invest in interventions for 100% of volume and does not have physical traceability	A&B - 100	1200	100	650 A CA		

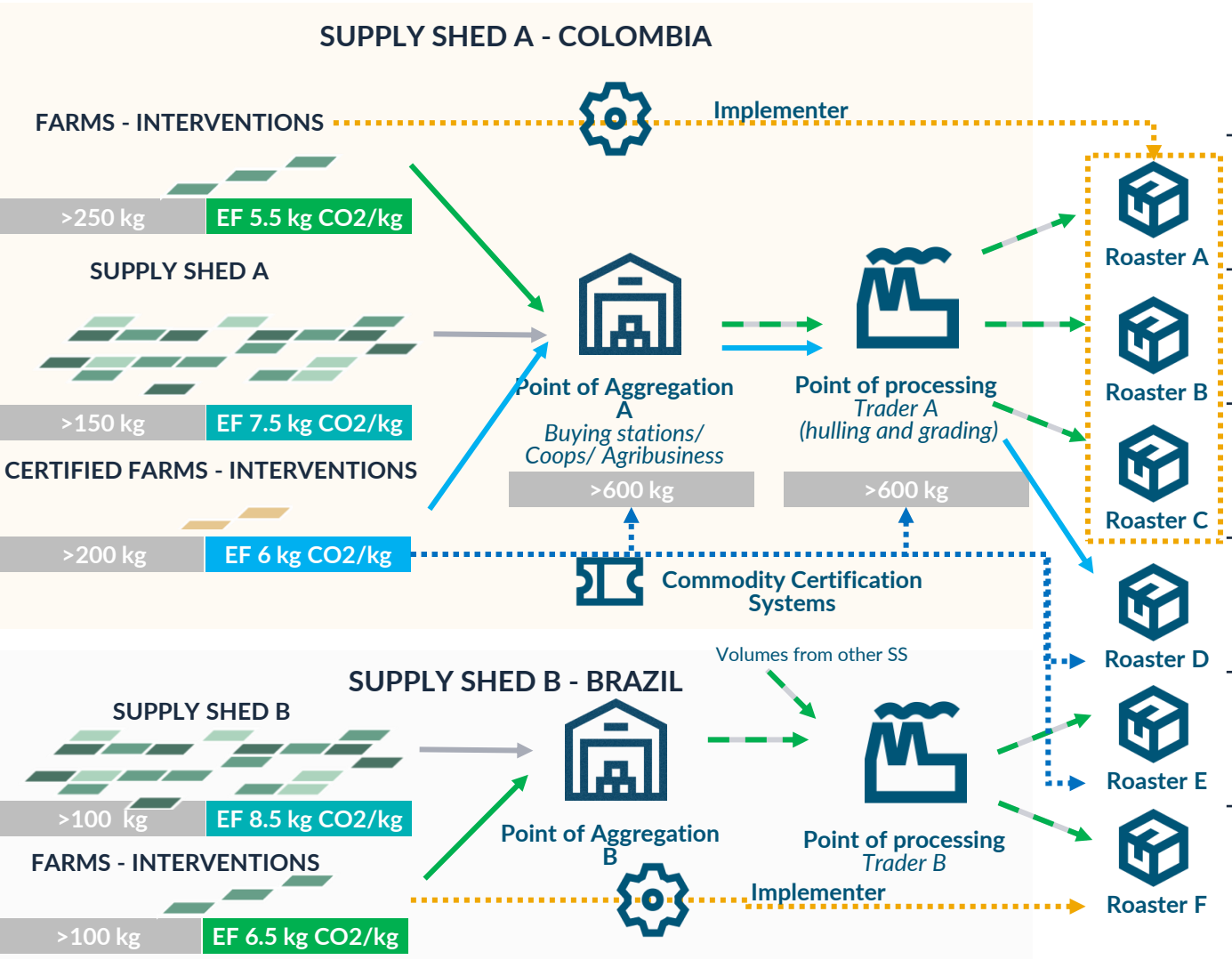
ValueChange

Mixed: low emissions and conventional goods
Low emissions goods/ impacted by interventions
Certified supply chains (segregated)
Conventional goods/not impacted by interventions

Accounting:
A Attributional accounting
C Consequential accounting

MBI:
CA Contractual agreements
CC Commodity certificates

Example in a coffee value chain (with data flows)



What they do?	GHG reporting in Year X					
	Physical inventory		MB statement		Actions statement	
	Sourced kg	Emissions CO2e/kg	Contracted kg	Emissions CO2e/kg	(Equivalent kg)	Emissions CO2e/kg
Invest in interventions for 200% of volumes and has SS traceability	SS A - 100	750	100	550 A CA	100	-550 C CA
Invest in interventions for 50% of volumes and has SS traceability	SS A- 100	750	50	225 A CA		
Nothing and has SS traceability	SS A – 100	750				
100% certified volumes segregated/traceable	SS A – 100	600 A CC				
Bought B&C certificates and and SS traceability	SS B – 100	850			0	-600 C CC
Invest in interventions for 100% of volume and does not have physical traceability	A&B - 100	1200	100	650 A CA		

ValueChange

Mixed: low emissions and conventional goods
Low emissions goods/ impacted by interventions
Certified supply chains (segregated)
Conventional goods/not impacted by interventions
Data
Data (certification scheme)

Accounting:
A Attributional accounting
C Consequential accounting

MBI:
CA Contractual agreements
CC Commodity certificates

Example in a coffee value chain

Roaster	Sourcing Region / Supply Shed	What They Do	Traceability Type	Type of Instrument / Engagement	Data Flow Source	Relevant Reporting Statement(s)	Notes on Accounting & GHG Reporting
Roaster A	Supply Shed A – Colombia	Invests in mitigation interventions covering 200% of sourced volumes	Supply Shed traceability (direct connection via Trader A)	Contractual agreement - direct investment in interventions	Data provided by Implementer through project-level monitoring and traceability through Trader A	Physical Inventory (SS A – 100 kg); Market Based and Actions Statement (100 kg equivalent but reported as impact)	High integrity: over-investment leads to emission reduction from 7.5 → 5.5 kg CO_2/kg. Reported under Attributional accounting and additional impact (stranded assets) reported in Actions inventory using consequential methods. Implementer should avoid assigning this impact to other buyers.
Roaster B	Supply Shed A – Colombia	Invests in interventions covering 50% of sourced volumes	Supply Shed traceability (direct via Trader A)	Contractual agreement - direct investment in interventions	Data provided by Implementer through project-level monitoring and traceability through Trader A	Physical Inventory (SS A – 100 kg); Market based Statement	Reduction partially reflected; reported under Attributional methods.
Roaster C	Supply Shed A – Colombia	No investment in interventions	Supply Shed traceability (via Trader A)	Conventional sourcing	Sourcing data from Trader A only (no intervention data)	Physical Inventory (SS A – 100 kg)	Baseline emissions reported (7.5 kg CO_2/kg). No mitigation or contractual adjustments.
Roaster D	Supply Shed A – Colombia	Purchases 100% certified volumes	Certified segregation CoC (Commodity Certification System) via Trader A	Commodity certificates (segregated model)	Certification system provides verified CoC and emissions factor	Physical Inventory (SS A – 100 kg)	Certified supply chain with verifiable data (EF = 6 kg CO_2/kg). Reported under Attributional accounting.
Roaster E	Supply Shed B – Brazil	Sources from Brazil but purchases Book-and-Claim (B&C) certificates from Colombia	Supply Shed traceability via Trade B and certificates detached from physical coffee	Book-and-Claim commodity certificates	Physical traceability provided by Trader B, and impact data provided by Certification System via registry	Physical Inventory (SS B – 100 kg) and Actions Statement	Mitigation detached from physical goods; reported under Consequential accounting.
Roaster F	Supply Sheds A & B – Colombia and Brazil	Sources mixed volumes (traceability broken) but invests in mitigation interventions in Supply Shed B equivalent to its sourced volume	No direct physical traceability; impact traceability only to interventions	Contractual agreement - direct investment in interventions (impact traceability)	Trader B only communicates origins but no traceability in place. Data provided by Implementer in Supply Shed B	Physical Inventory (A & B – 100 kg) as traceability is broken uses global EF; MB Statement	Reported as value chain associated mitigation under Attributional accounting – could also be Consequential accounting.

Different MBIs in use

Contractual Agreements

Roasters A, B, and F operate under contractual agreements, with data managed by implementers.

Roaster A claims in two ways:

- *Attributional claims* — mitigation outcomes linked to sourced goods.
- *Action claims* — mitigation outcomes declared as broader interventions.

Assumptions:

- Commodities are mixed, but traceability to the sourcing region (SS) is maintained, consistent with LSRS.
- Implementers track and allocate mitigation outcomes from interventions.
- Companies not participating in interventions cannot access improved emission factors (EFs).

Commodity Certificates

Roasters D and E use commodity certificates under two models:

- **Roaster D:** Buys segregated certified coffee; the certification system provides an EF for all certified farms in the region.
- **Roaster E:** Buys Book & Claim certificates, detached from physical goods.

Assumptions:

- The certification scheme is compliant with LSRS rules.
- The system tracks and verifies volumes and claims to avoid double counting.

Key Insights

- ✓ The six roasters demonstrate different levels of connection between sourcing and mitigation — from full physical traceability (A, D) to impact-based influence (E, F).
- ✓ Each pathway uses different types of MBIs, reflecting the diversity of credible mechanisms available.
- ✓ This diversity underscores the need for clear rules to define:
  - What qualifies for the physical inventory.
  - What belongs in a market-based (contractual) statement.
  - What fits within impact or action statements.
- ✓ The case highlights the importance of defining system boundaries — including geography, timeframe, and product groups — and clarifying value chain roles to ensure consistency and avoid double counting.

ValueChange

Thank you

Co-founded by SUSTAINCERT CREDIBLE CLIMATE ACTION Gold Standard

Roles – in a CoC all the actors need to be connected in a data tracking system

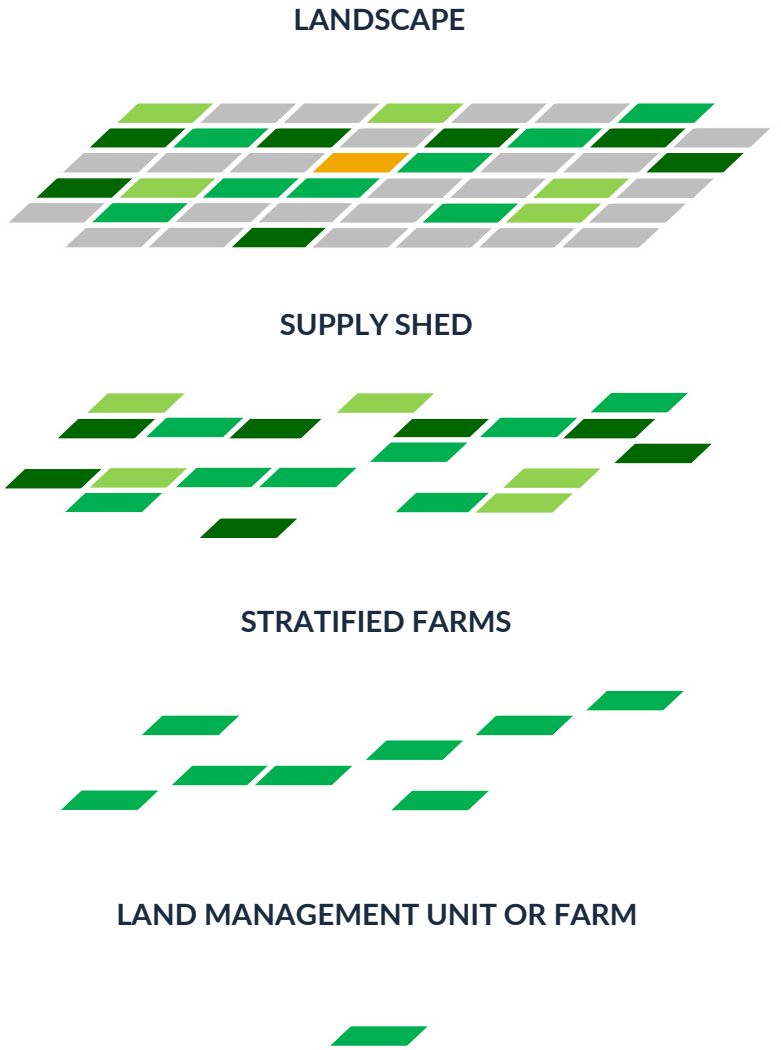
	Farmer	Point of aggregation	Trader/ Exporters	Roasters	Implementers	Certification systems
Role	Produce goods, either conventionally or with low GHG practices	(e.g., cooperatives, agribusinesses, buying stations) Purchase goods from farmers and aggregate according to certain qualities. Could include processing (e.g., drying).	Primary processing (hulling, grading) to get the green coffee ready for export. Trade/export the coffee to other businesses.	Process (blend and roast) coffee and pack it ready for consumption. Disclose to consumer information related to the product.	Collaborate with coffee farmers to implement practices that support sustainable and low carbon production.	Act as the bridge between commitments and verified outcomes — ensuring that value chain claims are traceable, credible, and aligned with recognized global standards.
Relation to interventions	Implement practices in the farm and report data.	Facilitate interventions (e.g., collect data from farmers, provide access to capacity building).	Usually intervention proponents/ representatives, supporting farmers in the implementation of improved practices.	Support the interventions (by coinvesting) in collaboration with the intervention proponents/ representatives.	Support implementation, collect data, etc.	Operationalize and verify value chain interventions — transforming actions into reportable climate impacts.

Supply shed definition

A supply shed is a group of suppliers providing functionally equivalent goods or services within a fixed and spatially defined area that is demonstrably part of a company's supply chain.

The supply shed includes **all suppliers** within designated boundaries, regardless of their practices or segmentation. However, to leverage lower emission factors resulting from Value Chain Interventions or practices that are specific from specific segments of producers within the supply shed, companies can create different **strata** of emission factors and account accordingly.

A supply shed could comply with the sourcing region requirements from the LSRG, provided that the boundary is on a subnational level, the physical traceability is in place and the EF used reflects the sourcing region.



Developing Emission Factors (EFs)

	**LANDSCAPE**	*Not an EF, for reference only.* A landscape includes all the lands within a territorial boundary, productive and unproductive and all types of practices.
	**SOURCING REGION/ SUPPLY SHED EF**	The EF for all attributable productive lands producing the same good or commodity that are being sourced by the reporting company within the boundaries of the sourcing region/ Supply Shed.
	***Stratified EF***	The EF for a subset of farms within a sourcing region/ Supply Shed that share common characteristic (e.g., similar practices, part of a program, certified).
	***Residual EF***	The EF for *all* the other farms in the sourcing region/ Supply Shed that have not been included in the stratified EF. This is a means to avoid double counting.
	**LAND MANAGEMENT UNIT SPECIFIC EF**	The EF representing the emissions from one good (e.g. a crop or raw milk) from the LMU in a given year. This could relate to a farm, or one or several fields or plots. Under LSRG companies accounting at LMU may include non -productive adjacent and proximate lands*.
	**HARVESTED AREA SPECIFIC EF**	The EF representing the emissions related to a spatially explicit area of productive agricultural land that was harvested at a given time to produce the good of interest.

Mass balance example – recycled metal

- Starting point – what was their accounting process initially (before MB)
  - Can this approach be described in CoC terms as well?
- How did they create a business case for doing this?
- What did they build as a MB data system?
- What actually is a product anyway?
  - (hint – a distinguishable thing you sell to clients)
- Why is this MB?
  - Why might it not be MB?

- Our requirements at Carbon Trust for some context:
  - https://ctprodstorageaccountp.blob.core.windows.net/prod-drupal-files/documents/resource/public/Mass%20Balance%20Requirements.pdf

Starting point

- Initial case is receiving 2 forms of input metal
  - Virgin, normal processes
  - Recycled

- Split these inputs evenly across sites and across products sold

- Don’t take account of which site purchases recycled material or client – just one aggregated product
    - Either by aggregation of data into company-wide categories
    - Or by weighted average allocation for LCA (that is, we don't normally do per site LCA but per product)

- Normal LCA as an example of rolling average, multi-site mass balance?

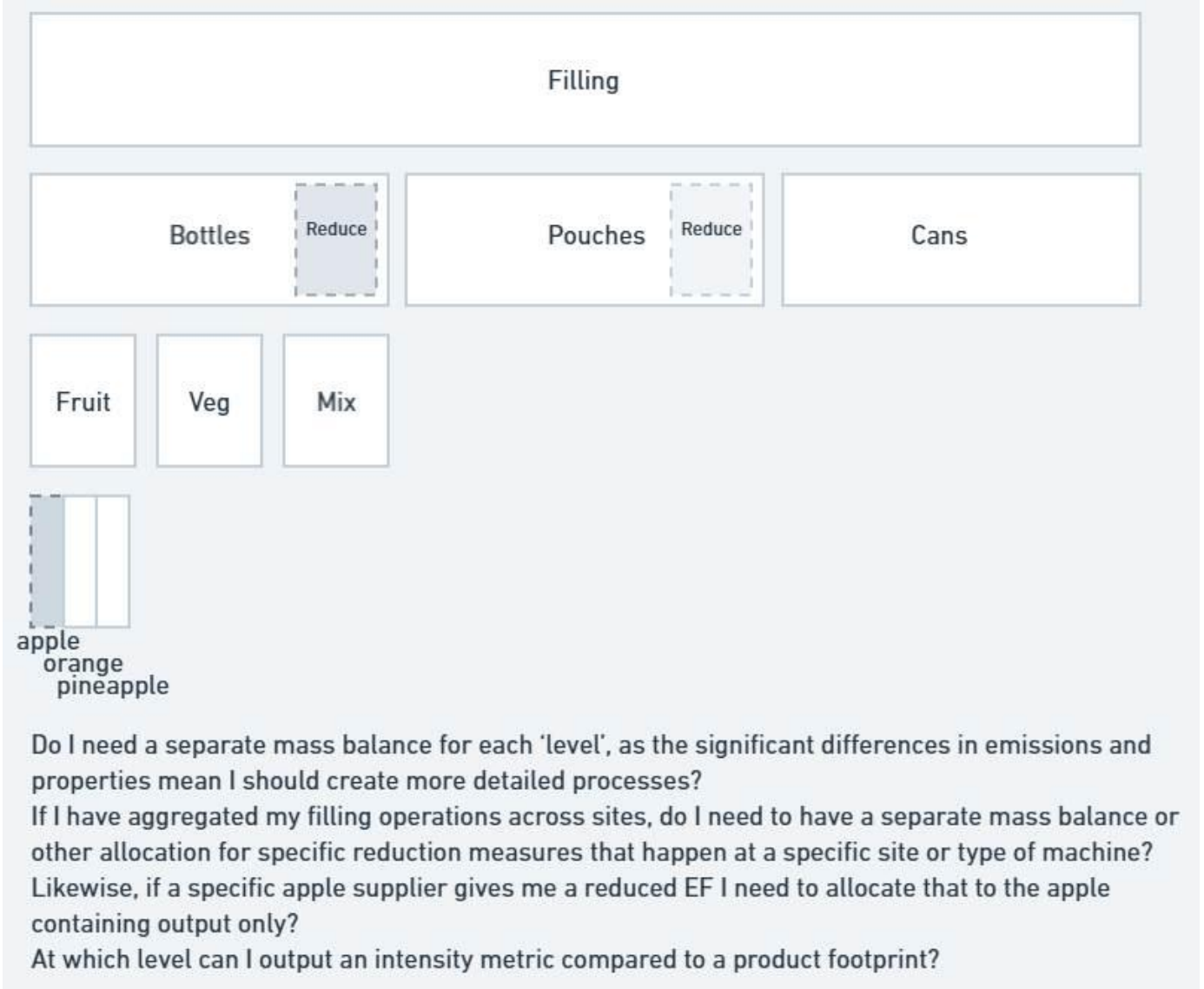
Business case

- Clients willing to pay a premium for recycled metal products

- Clients willing to get a discount by helping with a “deposit return scheme”
  - A supply of better quality pre-consumer waste
  - Harder to get and to process post-consumer waste

How did they define a product? (sorry, example is not metal!)

- What is a “product” isn’t necessarily clear
- 14064-1/GHGP intensity metrics vs 14067 attributional concepts may differ
  - There are a number of ways to group or aggregate in this example
- Do I want to sell lower GHG bottles, bottled fruit or bottled apple?
- I’m not sure it matters – you still need to define which of the specific end products will have a lower GHG claim attached to them
- The MB CoC operates within the organisation as well as between organisations
- CoC therefore provides a way to reconcile intensity metrics and LCA when passing data downstream



What mass balance data system did they build?

Physical inventory

Map facilities, products and core processes	• Get primary data about recycled content and use • Purchased materials, energy and production/sales by product
Track materials	• Those that can mix (i.e. be fungible) per product
Log any limits	• What % recycled content per product, based on physical constraints
Map the physical relationships by tonne	• Need to understand what kg materials are needed & where • Including co-product allocation
Check that you don't exceed limits	• When mapping recycled material availability or constraints
Apply the relevant emission factors	• E.g. virgin or recycled metal EFs
Calculate the footprints	
Sell MB versions of relevant **product** types	
Track who sold to, what and how much	• Balance the input / output masses
Reclaim recycled materials	• From clients to use as new recycled materials • Don't have to reclaim from the same MB clients • But perhaps this is a difference between GHG accounting and circularity?

Market-based inventory

See also this related example from Dow https://www.dow.com/en-us/brand/sustainability-science/carbon-footprint-ledger.html

Why this is, or is not, mass balance

- A key consideration was their multi-site configuration:
  - Multiple sites in multiple countries
  - Don’t sell from specific sites at client request but due to physical availability
  - Don’t have recycled metal at every site, based upon local availability
  - Expensive (and high emission) to move metal around

SBTi Update

Tuesday, November 11th

5:00 – 6:00 pm

GREENHOUSE GAS PROTOCOL