GREENHOUSE GAS PROTOCOL

Actions and Market Instruments Technical Working Group

Meeting # 1.07

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May 21, 2025

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Agenda

- Housekeeping
- Calculation examples
- Next steps

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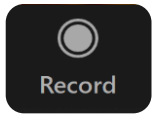
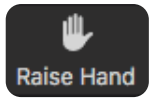
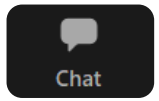


This meeting is recorded.



Please use the Raise Hand function to speak during the call.



You can also use the chat function in the main control.

Recording, slides, and meeting minutes will be shared after the call.

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

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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

Today's Objectives

1. Review calculation examples to further explore framework proposals

Meeting Schedule

- Where we are:

Meeting	Date	Topic
1	Oct 23, 2024	Content introduction
2	Dec 4, 2024	Current GHG Protocol approach, introduction of use cases
3	Jan 15, 2024	Achieving use cases in relation to reporting structure
4	Feb 19, 2025	LSR Standard interim traceability requirement & framework proposals
5	Mar 26, 2025	Review & discuss v1 proposals
6	Apr 23, 2025	Areas of proposal divergence
7	**May 21, 2025**	**Calculation examples**
8	June 25, 2025	Feedback from ISB
9	July 30, 2025	TBD

Review of Scope 2 consequential subgroup proposals

- Three proposals were submitted for methods to quantify emissions impacts of electricity sector actions
- With the majority of support thus far, Proposals 1 and 2 will be the focus of the subgroup's part 2 work

Proposal 1: Marginal Emissions Impact	Proposal 2: Ad-hoc Consequential Guidance	Proposal 3: Routine Consequential Accounting
• Induced consumption from load, using MERs • Avoided emissions from generation projects (additionality required) using MERs • Net impact (induced – avoided)	• Applicable to all projects that have a high likelihood of producing negative secondary effects • Accounting framework closely resembles traditional project accounting	• Emissions induced or avoided from changes in electricity demand • Emissions induced or avoided from changes in electricity procurement • Impact score, relative to the highest possible global impact

Update on Scope 2 consequential subgroup deliverable

- The Secretariat has determined that the method presented in Proposal 1 yields a sector-specific metric that will not be standardized across sectors. **As a result, this proposal is proceeding directly to the ISB**

- Proposal 2 does present a method that can potentially be standardized across sectors, and therefore **will remain an input to the AMI working group**

Proposal 1: Marginal Emissions Impact

- Induced consumption from load, using MERs
- Avoided emissions from generation projects (additionality required) using MERs
- Net impact (induced – avoided)

Proposal 2: Ad-hoc Consequential Guidance

- Applicable to all projects that have a high likelihood of producing negative secondary effects
- Accounting framework closely resembles traditional project accounting

***Infront of the ISB as of 5/21/2025**

Agenda

- Housekeeping
- **Calculation examples**
- Next steps

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Worked examples for proposals

- The following examples will be used to consider how different scenarios would be handled within each proposed framework from the perspective of a single organization in an annual GHG report.

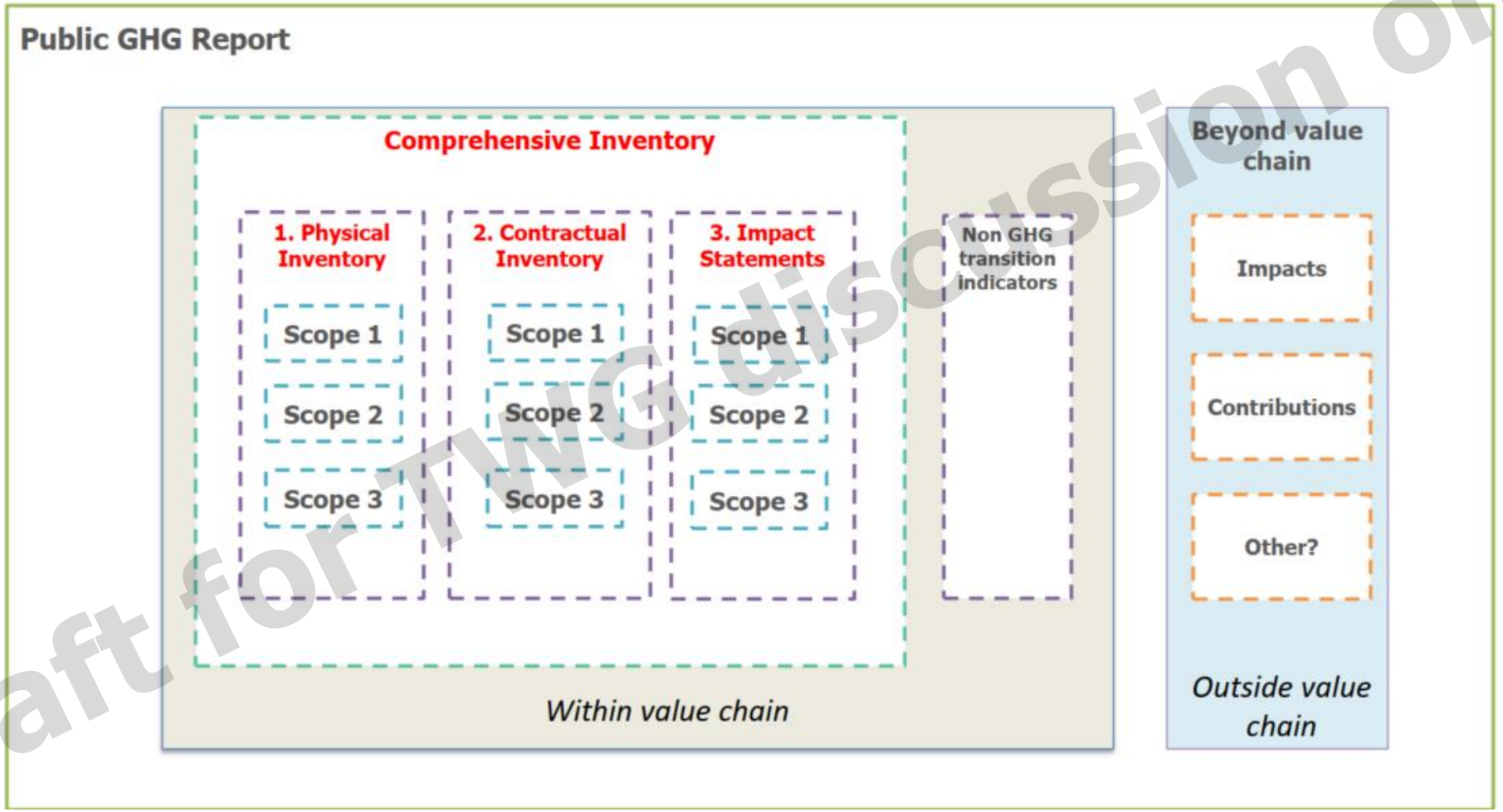
- Your presentations should include:
  - Any relevant calculations and assumptions
  - A visual representation (e.g. table) of how the activities and/or impacts would be reported in all relevant statements
    - Both individually and in an aggregated report
  - Any additional details or supporting information

- TWG members will present their worked examples, with time for clarifying questions and discussion

Assumptions

- Report only in CO_2e for this exercise
- Unless otherwise specified, all activities take place in the reporting year
- Where additional information is necessary, utilize publicly available EFs and document any assumptions
- All tons are metric tons

Framework A



Framework B

GHG Inventory Report

Physical Inventory

- Scope 1
- Scope 2
- Scope 3

Market-Based Inventory

- Scope 1*
- Scope 2*
- Scope 3*

Corporate Climate Actions

Impact Mitigation**

- Within Value Chain
- Outside Value Chain
- Neutralization Claims

Non-GHG Metrics Paused

Current

Proposed

*If reporting in-scope outside of GHGP-defined inventory boundary, report traceability category used (with justification).

**Consequential accounting used in this statement – Registry-listed, third-party verified impact is a separate category.

Framework C

New reporting elements

Inventory Report

Physical Inventory* (Statement #1a)

Scope 1

Scope 2 (location based)

Select[1] other indirect emission sources

- Estimated from primary data with accuracy, trend sensitivity & comparability

Value Chain Analysis* (Statement #1b)

Estimation of non-observable emissions in "value chain"

- Existing Scope 3 categories
- Spend-based EFs
- Require reporting of uncertainties
- Min frequency of reporting of significant changes every [2/4] years

Non GHG transition indicators (Statement #2)

Sector-specific metrics addressing activities and status of key transitions within "value chain"

Examples

- *% EV sales*
- *Tonnes of green H_2 consumption*

Contribution Report

Beyond inventory mitigation** (Statement #3)

Climate impacts achieved through interventions to sources/sinks not in the inventory

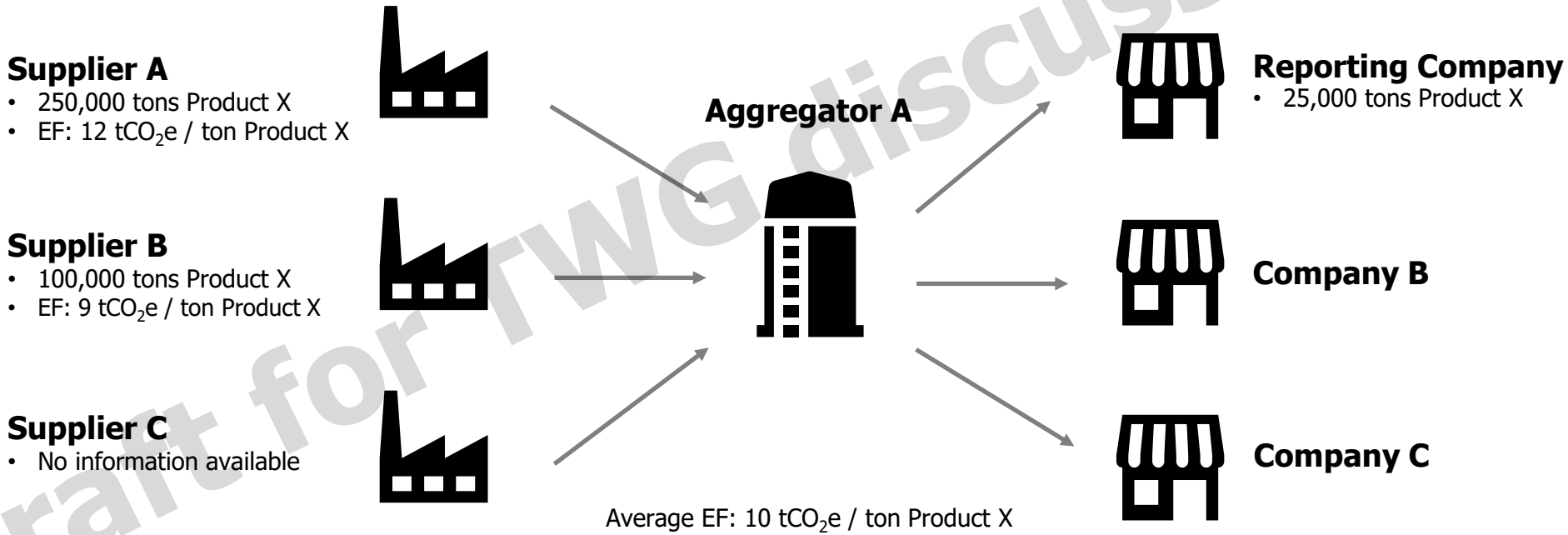
- Discrete interventions
- With or without use of market-based "certificates"
- Disclose whether impacts are inside or outside of the "value chain" (or if there is uncertainty about in or out)
- Aggregated impact across interventions for corporate goal tracking

* Emissions and removals reported separately ** Consequential methods applied. Avoided emissions and enhanced removals reported separately.

[1] Industry-specific specified sources and sinks quantified with primary data. See Figure 2 in https://ghginstitute.org/2024/10/28/is-scope-3-fit-for-purpose-alternative-ghg-accounting-frameworks-for-inventories-and-intervention-impacts/

Example 1 - Baseline

The reporting company purchases 25,000 tons of Product X from a regional aggregator. Assume that the aggregator is a mixing point only (i.e. no additional processing) with no segregation or product tracing mechanisms.



Example 1

1.1: Project Investment

- The Reporting Company fully finances a project for Supplier A which improves emissions per output efficiency by 50% for all production.

1.2: Crediting

- The Reporting Company buys credits from Supplier B through a third-party registry.
- The credits represent 10,000 tCO_2e emissions reductions associated with 5,000 tons of Product X.

Framework A: Example 1 Baseline – Worked Example

Input data, additional assumptions, and calculations

	Emission source	Activity data (tons of product X)	Emission factor (tCO2e/t X)	Emissions (tCO2e)	Emissions reduction (tCO2e)
Physical supply	Aggregator A	25,000	10	250,000	
Interventions	1.1: Supplier A Project	250,000	6	1,500,000	
	Of which related to value chain	20,000	6	120,000	
	Of which BVCM	230,000	6	1,380,000	
	1.2: Supplier B Credits	5,000	7	35,000	(10,000)

1.1 amount (20,000) + 1.2 amount (5,000) = 25,000 (tons of product X)
1.1 emissions factor = 12 tCO2e/tX / 2 = 6 tCO2e/tX

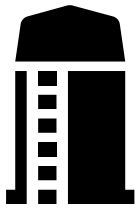
Summary report by statement

- We assume that reporting company only procures product X (and anything associated with product X) from Aggregator A.

	Statement 1	Statement 2	Statement 3	BVCM
Scope and Category or other	**Physical emissions (tCO2e)**	**Contractual emissions (tCO2e)**	**Project emissions (tCO2e)**	**Reported separately (tCO2e)**
Scope 3 category X	250,000	170,000	(10,000)	
Other				(1,380,000)

Framework B: Example 1 – Inventory Prior to Intervention

Aggregator A



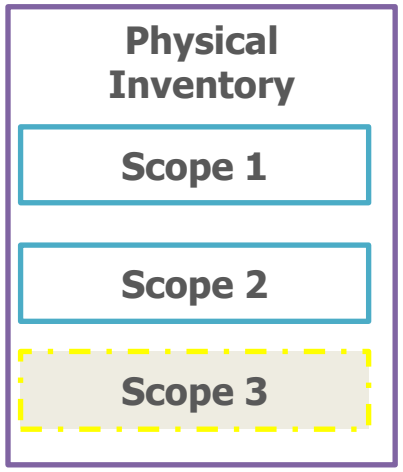
Reporting Company
- 25,000 tons Product X

GHG Activity	Amount Sourced (tonnes)	Year	EF	Statement	Scope.Cat	Tonnes GHG Emissions
Product X	25,000	1	10	Physical Inventory	3.1	250,000

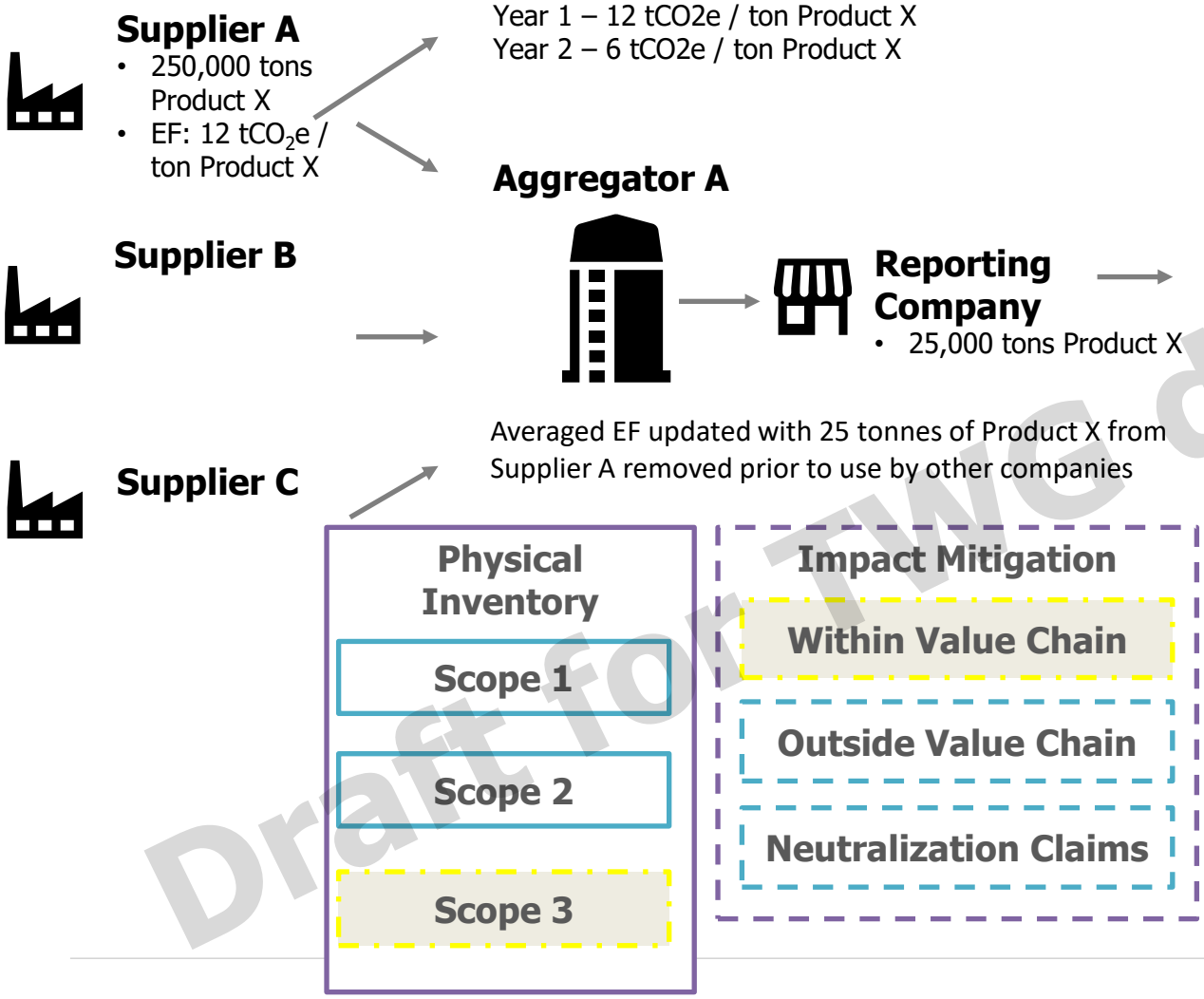
Average EF: 10 tCO_2e / ton Product X

Assumptions

- Reporting Company has been sourcing Product X for (at least) two years
  - 25k tonnes sourced each year
- Aggregator A knows how much they source from Supplier A and B, and the EFs for those quantities (Aggregator A does not consider using mass balance / sourcing region traceability to assign suppliers to a reporting company until interventions occur)
- Current inventory year is year 2



Framework B: Example 1.1 – Reporting Company Finances 50% CI Reduction for Supplier A



Year 1 Recalculation

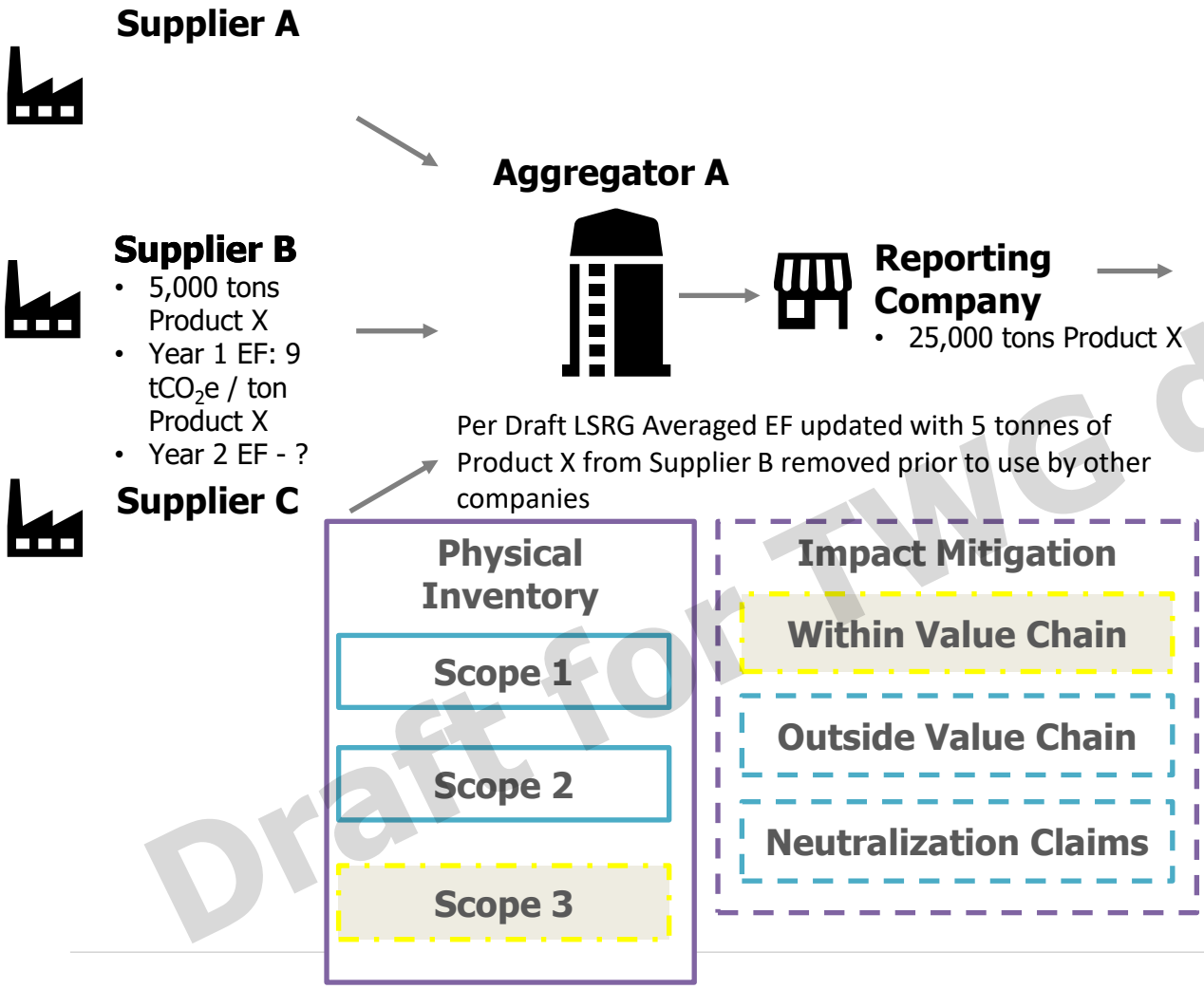
Statement	GHG Activity	Amount Sourced (tonnes)	Year	Scope .Cat	EF	Tonnes GHG Emissions
Physical Inventory	Product X Supplier A	25,000	1	3.1	12	300,000
Physical Inventory	Product X Supplier A	25,000	2	3.1	6	150,000

Statement	GHG Activity	Scope.Cat	Tonnes GHG Impact
Impact Mitigation	Product X Supplier A	Within Value Chain	X*

This is likely not 1.5M Tonnes...what if the 50% intensity reduction was following a drought year?

*Impact needs to be validated via consequential methods (is there weather-driven variation to control for, was the investment by reporting company fully additional, is there leakage/indirect impact that has not been accounted for, etc.)?

Framework B: Example 1.2 – Reporting Company buy 10k credits (5k tonnes of product) from Supplier B



Year 1 Recalculation

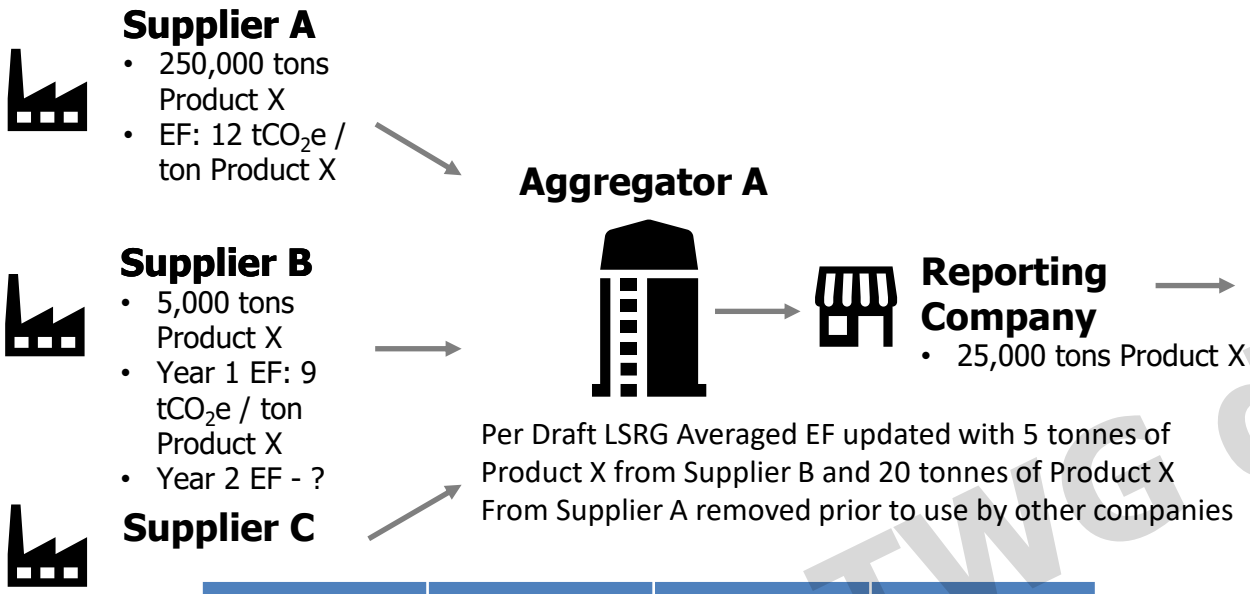
Statement	GHG Activity	Amount Sourced (tonnes)	Year	Scope.Cat	EF	Tonnes GHG Emissions
Physical Inventory	Product X Supplier Avg	20,000	1	3.1	10	200,000
Physical Inventory	Product X Supplier B	5,000	1	3.1	9	45,000
Physical Inventory	Product X Supplier Avg	20,000	2	3.1	10	200,000
Physical Inventory	Product X Supplier B	5,000	2	3.1	X	?

Statement	GHG Activity	Scope.Cat	Tonnes GHG Impact
Impact Mitigation	Product X Supplier B	Within Value Chain*	10,000

*Verified on "X" Registry under "X" Protocol Proposed as potential "Category"

EF not defined, but could be provided by project (variant scenario carbon intensity). This is important because In agriculture EFs can increase even if positive impact occurs using consequential methods.

Framework B: Example 1.2 & 1.3 in the same inventory year



Statement	GHG Activity	Scope.Cat	Tonnes GHG Impact
Impact Mitigation	Product X Supplier A	Within Value Chain*	X - Unknown
Impact Mitigation	Product X Supplier B	Within Value Chain*	10,000

Year 1 Recalculation

Statement	GHG Activity	Amount Sourced (tonnes)	Year	Scope.Cat	EF	Tonnes GHG Emissions
Physical Inventory	Product X Supplier A	20,000	1	3.1	12	240,000
Physical Inventory	Product X Supplier B	5,000	1	3.1	9	45,000
Physical Inventory	Product X Supplier A	20,000	2	3.1	6	120,000
Physical Inventory	Product X Supplier B	5,000	2	3.1	X	X - Unknown

- Following a sourcing region approach reporting company may assume all 25,000 tonnes they source are from Supplier A or split 20,000 tonnes from supplier A 5,000 tonnes from supplier B.

*Verified on "X" Registry under "X" Protocol Proposed as potential "Category"

Framework B: Example 1 Key Challenges / Assumptions

- For this example we assume the EFs between suppliers are comparable for Product X, but in practice this is unlikely to occur due to significant parameter uncertainty (if Aggregator A is completing the EFs for each of their suppliers), or due to differences in methodologies used by the Suppliers A, B, and C. Even with similar methods, practices are just one component that influence CI; given this changes in CI should should not be assumed to be due to practices at face value.
- 1.1 - Judging by the images used, we assumed this is a land-sector example. As mentioned above, weather, soil, and variation in crop years will cause "background" variation in Efs. **This means that the 50% decrease in Supplier A CI may not be all due to action funded by the reporting company. The best way to verify the impact of this action is via consequential methods.**
- 1.2 - The EF for the 5,000 tonnes of impacted product is not provided in this example, just 10,000 tonnes of impact using consequential methods. **It should be noted that if we can estimate consequential impact, it means we are quantifying a variant (project) scenario and thus should be able to provide carbon intensity of that scenario for inventory accounting. If we had this scenario, as mentioned above, it is possible this value may be a higher EF than before the action in 1.2 was taken.**

Framework C: Example 1 before interventions

Inventory Report

Physical Inventory* (Statement #1a)

Scope 1

Scope 2 (location based)

Select[1] other indirect emission sources

- Emission sources are only partly "visible" to reporting company so partly outside boundary

Value Chain Analysis* (Statement #1b)

Estimation of non-observable emissions in "value chain"

250,000tCO2e (calculation: 25000* 10 EF)

Non GHG metric transition indicators (Statement #2)

Sector-specific metrics addressing activities and status of key transitions within "value chain"

Examples

- *% EV sales*
- *Tonnes of green H_2 consumption*

Contribution Report

Beyond inventory mitigation** (Statement #3)

Climate impacts achieved through interventions to sources/sinks not in the inventory

- Discrete interventions
- With or without use of market-based "certificates"
- Disclose whether impacts are inside or outside of the "value chain" (or if there is uncertainty about in or out)
- Aggregated impact across interventions for corporate goal tracking

* Emissions and removals reported separately ** Consequential methods applied. Avoided emissions and enhanced removals reported separately.

[1] Industry-specific specified sources and sinks quantified with primary data. See Figure 2 in https://ghginstitute.org/2024/10/28/is-scope-3-fit-for-purpose-alternative-ghg-accounting-frameworks-for-inventories-and-intervention-impacts/

Authors: Gilles Dufrasne, Michael Gillenwater, Jonathan Crook, Injy Johnstone, Thomas Day, Derik Broekhoff (not AMI member)

Framework C: Example 1.1 after intervention

Inventory Report

Physical Inventory* (Statement #1a)

Scope 1

Scope 2 (location based)

Select[1] other indirect emission sources

- Emission sources are only partly "visible" to reporting company so partly outside boundary

Value Chain Analysis* (Statement #1b)

Estimation of non-observable emissions in "value chain"

250,000tCO2e (unchanged)

Non GHG metric transition indicators (Statement #2)

Sector-specific metrics addressing activities and status of key transitions within "value chain"

Examples

- *% EV sales*
- *Tonnes of green H_2 consumption*

Contribution Report

Beyond inventory mitigation** (Statement #3)

Climate impacts achieved through interventions to sources/sinks not in the inventory

- Avoided emissions of 1,500,000 tCO2e, assuming intervention is recognized as "ambitious" and "quantifiable"

* Emissions and removals reported separately ** Consequential methods applied. Avoided emissions and enhanced removals reported separately.

[1] Industry-specific specified sources and sinks quantified with primary data. See Figure 2 in https://ghginstitute.org/2024/10/28/is-scope-3-fit-for-purpose-alternative-ghg-accounting-frameworks-for-inventories-and-intervention-impacts/

Authors: Gilles Dufrasne, Michael Gillenwater, Jonathan Crook, Injy Johnstone, Thomas Day, Derik Broekhoff (not AMI member)

Framework C: Example 1.2 after intervention

Inventory Report

Physical Inventory* (Statement #1a)

Scope 1

Scope 2 (location based)

Select[1] other indirect emission sources

- Emission source is not "visible" to reporting company so outside boundary

Value Chain Analysis* (Statement #1b)

Estimation of non-observable emissions in "value chain"

250,000 tCO2e (unchanged)

Non GHG metric transition indicators (Statement #2)

Sector-specific metrics addressing activities and status of key transitions within "value chain"

Examples

- *% EV sales*
- *Tonnes of green H_2 consumption*

Contribution Report

Beyond inventory mitigation** (Statement #3)

Climate impacts achieved through interventions to sources/sinks not in the inventory

- Avoided emissions of 10,000 tCO2e, assuming credits are recognized as "ambitious" and "quantifiable"

* Emissions and removals reported separately ** Consequential methods applied. Avoided emissions and enhanced removals reported separately.

[1] Industry-specific specified sources and sinks quantified with primary data. See Figure 2 in https://ghginstitute.org/2024/10/28/is-scope-3-fit-for-purpose-alternative-ghg-accounting-frameworks-for-inventories-and-intervention-impacts/

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Example 1 - aggregate

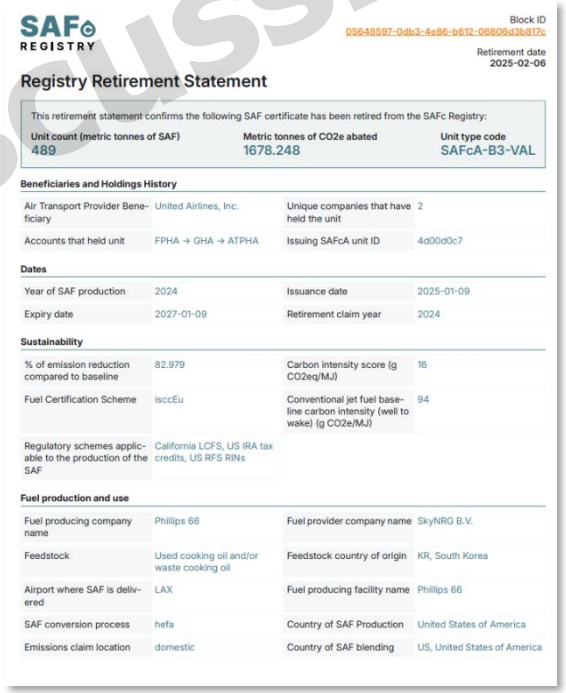
	GHG Activity	Reporting Element	Statement 1	Statement 2	Statement 3	Statement 4
Framework A			Physical emissions (tCO_2e)	Contractual emissions (tCO_2e)	Project emissions (tCO_2e)	Reported separately (tCO_2e)
		Scope 3 category X	250,000	120,000	(10,000)	
		Other				(1,350,000)
Framework B			Physical Inventory (tCO_2e)	Market-Based Inventory (tCO_2e)	Impact Mitigation (tCO_2e impact)	
	Product X Supplier A	Scope 3 category 1, year 1	240,000			
	Product X Supplier B	Scope 3 category 1, year 1	45,000			
	Product X Supplier A	Scope 3 category 1, year 2	120,000		X - unknown	
	Product X Supplier B	Scope 3 category 1, year 2	X - unknown			
	Crediting				10,000	
Framework C			Value Chain Analysis (tCO_2e)		Contribution Report (tCO_2e avoided)	
	Project Investment		250,000		1,500,000*	
	Crediting				10,000*	

*assuming intervention is recognized as "ambitious" and "quantifiable"

Example 2 – SAF

The Reporting Company purchases SAF certificates to fully match volume of fuel use associated with business travel. The SAF certificates are centralized in a book and claim registry.

Relevant details: (see example certificate)



SAFc REGISTRY

Block ID 05648597-0db3-4e86-b612-06806d3b817c

Retirement date 2025-02-06

Registry Retirement Statement

This retirement statement confirms the following SAF certificate has been retired from the SAFc Registry:

Unit count (metric tonnes of SAF)	Metric tonnes of CO2e abated	Unit type code
489	1678.248	SAFcA-B3-VAL

Beneficiaries and Holdings History

Air Transport Provider Beneficiary	United Airlines, Inc.	Unique companies that have held the unit	2
Accounts that held unit	FPHA → GHA → ATPHA	Issuing SAFcA unit ID	4d00d0c7

Dates

Year of SAF production	2024	Issuance date	2025-01-09
Expiry date	2027-01-09	Retirement claim year	2024

Sustainability

% of emission reduction compared to baseline	82.979	Carbon intensity score (g CO2eq/MJ)	16
Fuel Certification Scheme	isccEu	Conventional jet fuel baseline carbon intensity (well to wake) (g CO2e/MJ)	94
Regulatory schemes applicable to the production of the SAF	California LCFS, US IRA tax credits, US RFS RINs		

Fuel production and use

Fuel producing company name	Phillips 66	Fuel provider company name	SkyNRG B.V.
Feedstock	Used cooking oil and/or waste cooking oil	Feedstock country of origin	KR, South Korea
Airport where SAF is delivered	LAX	Fuel producing facility name	Phillips 66
SAF conversion process	hefa	Country of SAF Production	United States of America
Emissions claim location	domestic	Country of SAF blending	US, United States of America

Framework A: SAFc Example 2

Input data, additional assumptions, and calculations

- Noting the example retirement statement provided is for SAFcA (air transport provider claims), but we assume that associated SAFcE (end user claims) are the same unit count

Assumed SAF energy density (MJ/mt) = 44,000 MJ/mt

Emissions from aircraft combustion = 3.16 kgCO2/kg = 71.8 gCO2e/MJ

WTW emissions from conventional jet fuel = 89 gCO2e/kg

	Emission source	Activity data (mt neat fuel)	Activity data (MJ)	Emission factor (gCO2e/MJ)	Emissions (mtCO2e)
SAF	WTW emissions	489	21,516,000	16	344
	Feedstock collection, processing, refining, transportation and distribution (WTT)	489	21,516,000	16	344
	Fuel combustion (TTW)	489	21,516,000	0	-
	Fuel combustion (TTW, biogenic CO2)	489	21,516,000	71.8	1,545
Conventional jet fuel	WTW emissions	489	21,516,000	89	1,915
	Feedstock collection, processing, refining, transportation and distribution (WTT)	489	21,516,000	17.2	370
	Fuel combustion (TTW)	489	21,516,000	71.8	1,545

Summary report by statement

- We assume air transport provider physically consumes fuel on a mass balance basis, so do not treat those as contractual emissions

Air transport provider (United) report looks like this (for the overlap with this particular corporate customer):

	Statement 1	**Statement 2**	**Statement 3**	BVCM
	Physical emissions (tCO2e)	**Contractual emissions (tCO2e)**	**Project emissions (tCO2e)**	Reported separately (tCO2e)
Scope 1	1,545			
Scope 3 Category 3	714			
Biogenic CO2 (separate)	1,545			

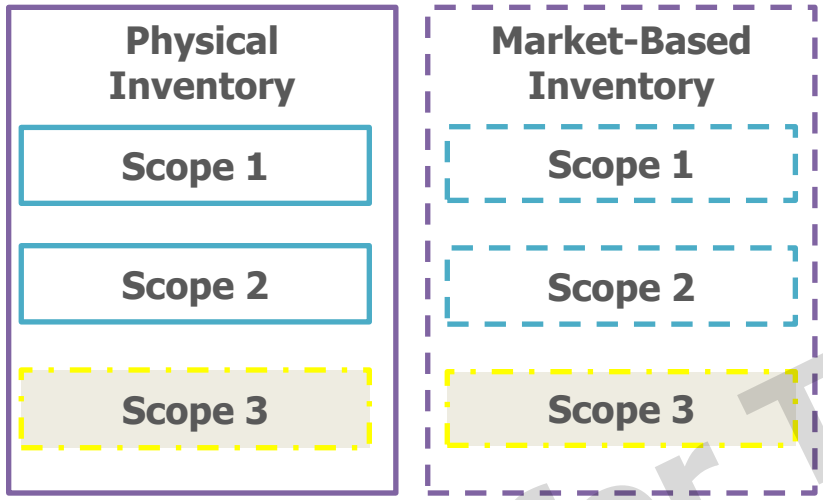
End user (assuming business travel user) report looks like this:

	Statement 1	**Statement 2**	**Statement 3**	BVCM
	Physical emissions (tCO2e)	**Contractual emissions (tCO2e)**	**Project emissions (tCO2e)**	Reported separately (tCO2e)
Scope 3 Category 6*	1,545	344		

* Noting that corporate end users increasingly report WTW emissions within S3 Category 6, although the boundary just requires TTW emissions

Note that today it is not common for aviation end users to receive fuel consumption data from airlines. It is common to use distance-based calculations today, but some still use spend. For the sake of this example, we used fuel-based assumptions as per prompt.

Framework B: Example 2 – SAF



Statement	GHG Activity	Amount Sourced (tonnes)	Year	EF	Scope.Cat	Traceability	Tonnes GHG Emissions
Physical Inventory	Business Travel	20.5 MMJ Jet Fuel*	1	9.4e-5**	3.6		1,927
Market-Based	Business Travel	20.5 MMJ Cooking Oil SAF*	1	1.6e-5**	3.6	Book and Claim***	328

* - Assume 42,000 MJ/Tonne Jet Fuel and SAF
** - CO2eq/MJ from Certificate in Slides
*** - Following this proposal justification should/shall be provided by reporting company when using book and claim traceability

Note - Reporting the impact of this action in the impact statement may also be relevant to review indirect impacts (would the cooking oil from this project have been recycled regardless resulting in displacement, etc.).

Framework C: Example 2 after interventions

Inventory Report

Physical Inventory* (Statement #1a)

Scope 1

Scope 2 (location based)

Select[1] other indirect emission sources

- Indirect emissions from business travel unchanged

Value Chain Analysis* (Statement #1b)

Estimation of non-observable emissions in "value chain"

- Estimates unchanged

Non GHG metric transition indicators (Statement #2)

Sector-specific metrics addressing activities and status of key transitions within "value chain"

Examples

- *% EV sales*
- *Tonnes of green H_2 consumption*

Contribution Report

Beyond inventory mitigation** (Statement #3)

Climate impacts achieved through interventions to sources/sinks not in the inventory

- Total avoided emissions caused by of SAF certificate market estimated ex post. Reporting company claims avoided emissions equal to their fraction of total certificate market impact based on retirement of that the reporting year vintage certificates

* Emissions and removals reported separately ** Consequential methods applied. Avoided emissions and enhanced removals reported separately.

[1] Industry-specific specified sources and sinks quantified with primary data. See Figure 2 in https://ghginstitute.org/2024/10/28/is-scope-3-fit-for-purpose-alternative-ghg-accounting-frameworks-for-inventories-and-intervention-impacts/

Authors: Gilles Dufrasne, Michael Gillenwater, Jonathan Crook, Injy Johnstone, Thomas Day, Derik Broekhoff (not AMI member)

Example 2 - aggregate

	Reporting Element	Statement 1	Statement 2	Statement 3	Statement 4
Framework A		Physical emissions (tCO_2e)	Contractual emissions (tCO_2e)	Project emissions (tCO_2e)	Reported separately (tCO_2e)
	Scope 3 category 6	1,545	344		
Framework B		Physical Inventory (tCO_2e)	Market-Based Inventory (tCO_2e)	Impact Mitigation (tCO_2e impact)	
	Scope 3 category 6	1,927	328		
Framework C		Value Chain Analysis (tCO_2e)		Contribution Report (tCO_2e avoided)	
		Estimates unchanged		Total avoided emissions caused by of SAF certificate market estimated ex post. Reporting company claims avoided emissions equal to their fraction of total certificate market impact based on retirement of that the reporting year vintage certificates	

Example 3 – Biomethane

The Reporting Company purchases biomethane certificates to match half of its volume of grid-sourced gas use at an owned and controlled facility. The biomethane supplier is injecting into the same grid from which the reporting company is sourcing.

Relevant details:

- Total natural gas combustion = 30,000 GJ
- Avoided emissions associated with lagoon methane venting = 0.250 tCO_2e/GJ

Framework A: Biomethane Example

Input data, additional assumptions, and calculations

- The avoided emissions are solely associated with avoided lagoon methane venting, and do not reflect the other lifecycle stages of biomethane production and combustion
- Because the purchased certificates represent biomethane production, combustion emissions are reported as zero within scope 1, but reported separately as biogenic CO2 emissions
- We assume that upstream processing etc emissions from biomethane production are 30 tCO2e/GJ, and the same for natural gas.

	Emission source	Activity data (GJ)	Emission factor (tCO2e/GJ)	Emissions (tCO2e)	Biogenic CO2 (tCO2)
Physical Supply	Natural gas combustion	30,000	0.0561	1,683	
	Upstream and processing emissions from natural gas production	30,000	0.03		
Certificates	Avoided emissions from lagoon methane venting	15,000	-0.25	(3,750)	
	Biomethane combustion	15,000	0		842
	Upstream and processing emissions from biomethane production	15,000	0.03	450	

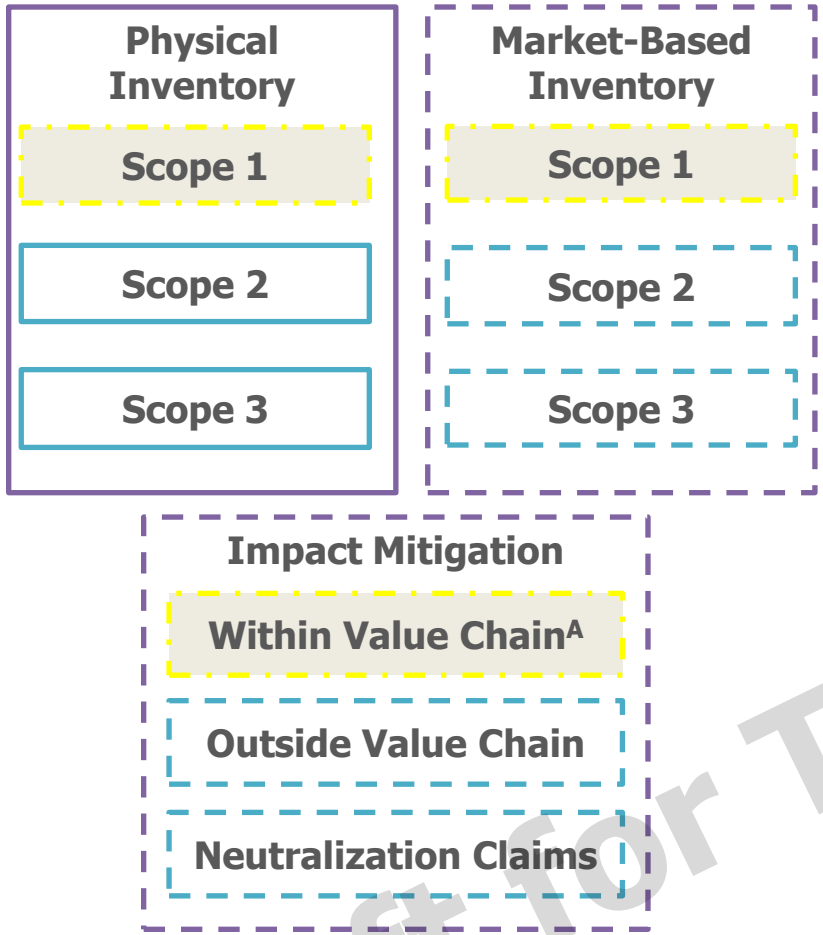
Summary report by statement

- As the biomethane avoided emissions calculation is consequential, it cannot be reported in statement 2, however the attributional components of its lifecycle can (upstream, processing, combustion).

	Statement 1	**Statement 2**	**Statement 3**	**BVCM and Other**
Scope and Category or other	**Physical emissions (tCO2e)**	**Contractual emissions (tCO2e)**	**Project emissions (tCO2e)**	**Reported separately (tCO2e)**
Scope 1	1,683	842	(3,750)	
Scope 3 Category 3	900	900		
Biogenic CO2				842

Framework B: Example 3 – Biomethane

Draft for TWG Discussion



[A] The term value chain here is subjective, further discussion may be needed to define what is directly related to the products / services a company provides.

Statement	GHG Activity	Amount Sourced (tonnes)	Year	Scope.Cat	EF	Traceability	Tonnes GHG Emissions
Physical Inventory	Stationary Combustion	30,000 GJ Nat. Gas	1	1	0.05 t CO2e/GJ*		1,500

Statement	GHG Activity	Amount Sourced (tonnes)	Year	Scope.Cat	EF	Traceability	Tonnes GHG Emissions
Physical Inventory	Stationary Combustion	15,000 GJ Nat. Gas	1	1	0.05 t CO2e/GJ*		750
Market-Based	Stationary Combustion	15,000 GJ Biometh-ane	1	1	0 t CO2e/GJ	Mass Balance	0

Statement	GHG Activity	Scope.Cat	Tonnes GHG Impact
Impact Mitigation	Use of Biomethane	Within Value Chain**	7,500**

* - 2025 EPA Emissions Factor Hub, Table 1 (just using CO2 EF for simplicity). In the example there may be traces of biomethane that impact this EF

** - Verified on "X" Registry under "X" Protocol Proposed as potential "Category"

*** - This includes avoided emissions but assuming the impact evaluation is expanded to evaluate the full Consequential CO2e impact of Biomethane use (such as processing emissions, etc.).

Framework C: Example 3 before interventions

Inventory Report

Physical Inventory* (Statement #1a)

1,683 tonne CO2

Scope 2 (location based)

Select[1] other indirect emission sources

Value Chain Analysis* (Statement #1b)

Estimation of non-observable emissions in "value chain"

- Estimates unchanged

Non GHG metric transition indicators (Statement #2)

Sector-specific metrics addressing activities and status of key transitions within "value chain"

Examples

- *% EV sales*
- *Tonnes of green H_2 consumption*

Contribution Report

Beyond inventory mitigation** (Statement #3)

Climate impacts achieved through interventions to sources/sinks not in the inventory

* Emissions and removals reported separately ** Consequential methods applied. Avoided emissions and enhanced removals reported separately.

[1] Industry-specific specified sources and sinks quantified with primary data. See Figure 2 in https://ghginstitute.org/2024/10/28/is-scope-3-fit-for-purpose-alternative-ghg-accounting-frameworks-for-inventories-and-intervention-impacts/

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Example 3 after intervention

Inventory Report

Physical Inventory* (Statement #1a)

1,683 tonne CO2

Scope 2 (location based)

Select[1] other indirect emission sources

Value Chain Analysis* (Statement #1b)

Estimation of non-observable emissions in "value chain"

- Estimates unchanged

Non GHG metric transition indicators (Statement #2)

Sector-specific metrics addressing activities and status of key transitions within "value chain"

Examples

- *% EV sales*
- *Tonnes of green H_2 consumption*

Contribution Report

Beyond inventory mitigation** (Statement #3)

Climate impacts achieved through interventions to sources/sinks not in the inventory

- 7,500 tCO2e from avoided lagoon methane + ex post estimated displaced fossil natural gas combustion, assuming certificate market intervention is deemed "ambitious" and "quantifiable"

* Emissions and removals reported separately ** Consequential methods applied. Avoided emissions and enhanced removals reported separately.

[1] Industry-specific specified sources and sinks quantified with primary data. See Figure 2 in https://ghginstitute.org/2024/10/28/is-scope-3-fit-for-purpose-alternative-ghg-accounting-frameworks-for-inventories-and-intervention-impacts/

Authors: Gilles Dufrasne, Michael Gillenwater, Jonathan Crook, Injy Johnstone, Thomas Day, Derik Broekhoff (not AMI member)

Example 3 - aggregate

	Reporting Element	Statement 1	Statement 2	Statement 3	Statement 4
Framework A		Physical emissions (tCO_2e)	Contractual emissions (tCO_2e)	Project emissions (tCO_2e)	Reported separately (tCO_2e)
	Scope 1	1,683	842	(3,750)	
	Scope 3 category 3	900	900		
	Biogenic CO_2				842
Framework B		Physical Inventory (tCO_2e)	Market-Based Inventory (tCO_2e)	Impact Mitigation (tCO_2e impact)	
		1,500			
		750	0	(7,500)	
Framework C		Value Chain Analysis (tCO_2)		Contribution Report (tCO_2e avoided)	
		1,683		7,500 tCO2e from avoided lagoon methane + ex post estimated displaced fossil natural gas combustion, assuming certificate market intervention is deemed "ambitious" and "quantifiable"	

Agenda

- Housekeeping
- Calculation examples
- **Next steps**

GREENHOUSE GAS PROTOCOL

WORLD RESOURCES INSTITUTE

World Business Council for Sustainable Development

Next Steps

Asks for TWG Members

- **Please prioritize attendance of open discussion calls** over the next few months!
  - Submit requests to the open discussion form **by Friday, May 23th** to be considered for call on May 28th
  - Agenda for optional open discussion calls will be sent out the Monday prior (i.e. May 26th)

Next Meeting Dates

- **Open Discussion Meeting**
  - Wednesday, May 23rd
- **TWG meeting # 1.08**
  - Wednesday, June 25th

GREENHOUSE GAS PROTOCOL

Thank you!

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