EnergyTag

GHGP SCOPE 2 CONSULTATION GUIDEBOOK

How to Respond to the Public Consultation

Executive Summary

- ➔ The Greenhouse Gas Protocol (GHGP) Scope 2 accounting standard update is open for consultation. It is important you respond to the **GHGP survey** before December 19, 2025.
- ➔ Utilize **EnergyTag's spreadsheet guide** to help shape the global standard for GHG emissions accounting — used by 97% of reporting S&P 500 companies.[1]
- ➔ The rest of this executive summary is a quick guide to the proposed changes to the GHGP Scope 2 accounting standard. The proposed changes — hourly accounting, deliverable market boundaries, and fair allocation of resources to encourage new projects[2] — will determine how electricity emissions are counted, could shape trillions of dollars in investment, inform regulations, & determine if "clean energy" usage claims are credible.

Two Pathways for Submission

Path 1. To respond to the consultation survey QUICKLY, focus on these questions:

Question	Topic	Recommended Answer
1-17	Your name, affiliation, etc.	Basic demographics info. Recommend "No" on Q3
69	US market-boundary	b. DOE Needs Study Regions (45V)
70	Threshold for hourly exemption	a. 5 GWhs or b. 10 GWhs
71	Hourly support	5 – Fully support
72	Reasons for support	Select all
83	Market-boundary support	5 – Fully support
84	Reasons for support	Select all
88	US market-boundary	b. DOE Needs Study Regions (45V)
89	Explanation	These boundaries align with power markets to improve accuracy without being overly restrictive, meeting the aligned goals of greater integrity, impact, and feasibility.
113	Residual mix integrity	5 – Fully support
114	Reasons for support	Select all
124	Use of fossil mix	5 – Fully support
125	Reasons for support	Select all
130	Feasibility measures	5 – Highly sufficient
146	Impact metric change your mind?	c. No
152	Overall revisions needed	Hourly matching, deliverable market boundaries, incrementality (SSS or other metric)
153	Exemptions for hourly matching	4 – General support or 5 – Fully support
163	Which exemption is appropriate?	d. Option 4
171	Legacy clause	4 – General support or 5 – Fully support

[1] https://ghgprotocol.org/about-us
[2] These rule changes are designed to meet the combined goals of integrity, impact, and feasibility.

Path 2. If you will respond to the consultation more fully (HIGHLY recommended), please begin in the "Start Here!" chapter and use our full recommendation **spreadsheet**.

What Key Changes Are Being Proposed?

The GHGP, with significant majority support from the Scope 2 Technical Working Group (TWG) and Independent Standards Board (ISB), is proposing updates that will improve alignment of "Scope 2" electricity emissions reporting with grid realities:

- **Temporality:** From annual to hourly clean energy accounting (for the largest energy users)
- **Deliverability:** From broad (continent-scale) to narrower (real grid-scale) boundaries, ensuring clean energy is "deliverable" to its claimer/consumer
- **Allocation:** From arbitrary to fair allocation of existing carbon-free electricity

How are rules structured for greater feasibility? The update proposes:

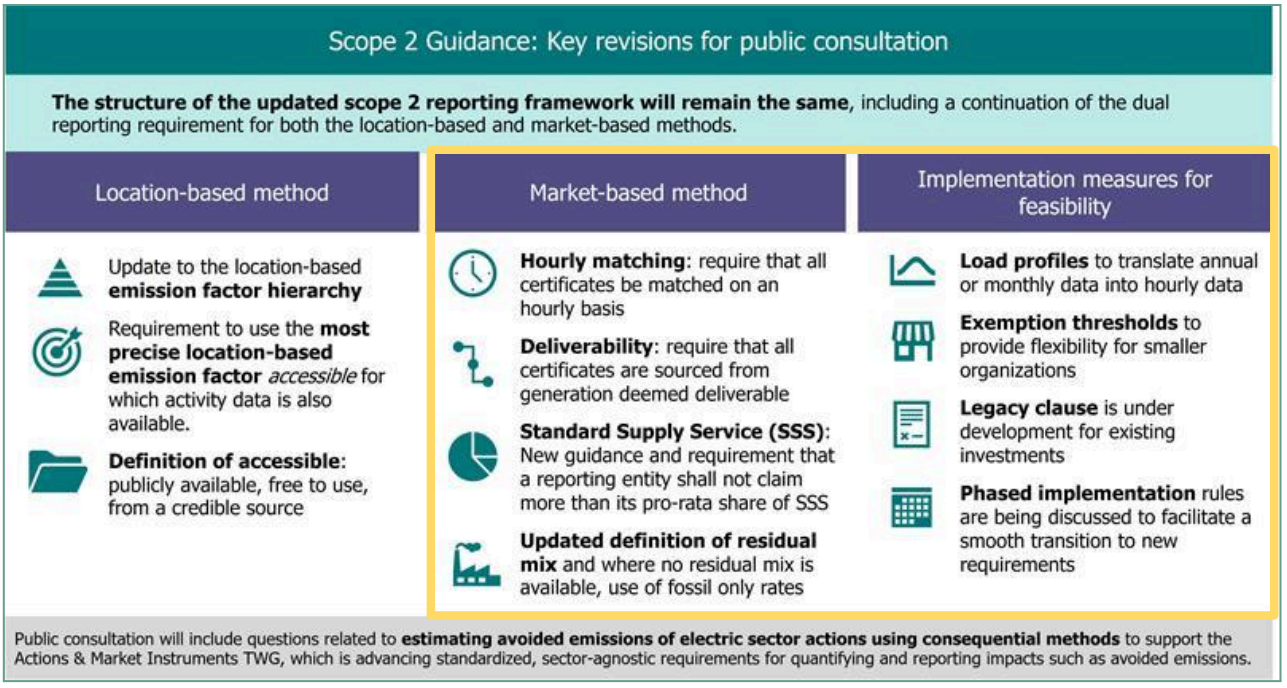
- Crediting long-term contracts under current accounting rules if signed before implementation of new standard
- Exempting small energy users from hourly accounting
- Using profiles where hourly data is not yet available
- Phasing in new rules for planning clarity and market development

Why do these changes matter for voluntary procurement emissions accounting?

- **Integrity matters**. "*The current [rules]...allow companies to claim they use 100% renewable power on the basis of annual matching – which means they can offset night-time coal use with extra purchases of daytime solar power. It's absurd and destroys public confidence. The rules are currently under review and need to be tightened*" — Michael Liebreich in BloombergNEF.

- Not being 100% clean yet is ok. **Full decarbonization is hard, and we should be honest about that**. Sourcing hourly and more locally properly values storage, clean firm power, and demand flexibility solutions - unlike current rules which do not - and research shows this accelerates their deployment (Princeton University et al.).

- This can **drive savings for ratepayers** by supporting the cost-effective (and reliable) integration of renewables onto the broader grid (TZ).
    - "*We find that the system value of annual matching portfolios is substantially below the cost to serve the corporate load with standard grid supply. In contrast, hourly matching portfolios bring a much higher value, which may even exceed the costs for serving the corporate load*" (IEA).



This chart outlines the proposed changes up for public consultation. Source: GHGP.

Frequently Asked Questions

Is this "24/7"?	**No**	This update is about accounting for emissions. No one will be required to be "24/7" matched.
Is more accuracy needed?	**Yes**	Current rules are too inaccurate to be credible. These changes are a significant improvement to integrity, while flexibility measures ensure feasibility.
Is there data?	**Yes...** and more is on the way	This data exists. Access and availability from suppliers and contracts is continuing to improve and load profile flexibility measures enable the use of hourly data from existing monthly/annual data.
Is this immediate?	**No**	Rules are published in 2027; there will likely be a phase-in and legacy contract rules.
Will this slow clean energy purchases?	**No**	Flexibilities, phaseins, and a legacy clause will support a smooth transition. And in the long run, these rules can support higher integrity and impactful clean energy purchases by encouraging the physical matching of clean energy procurement to claims.

Reach out to Alex Piper (alex@energytag.org) at EnergyTag with any questions, and visit scopetrue.org.

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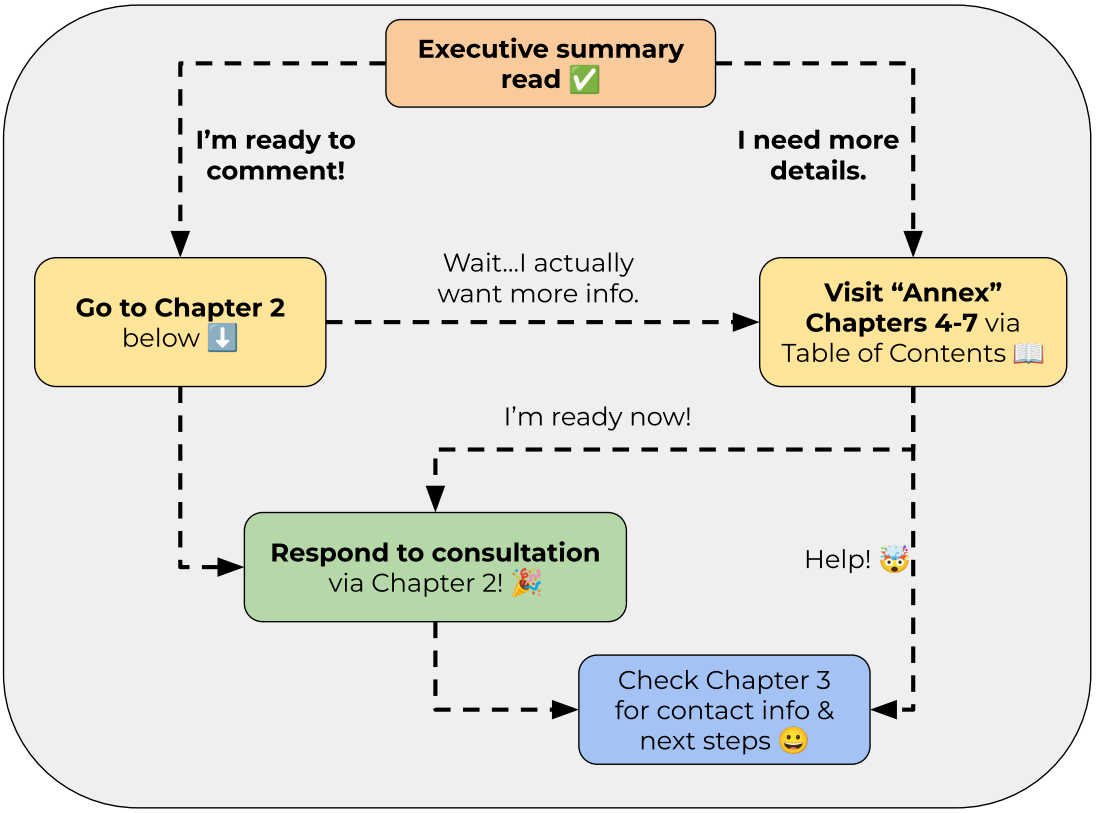
1. Start Here!

You've made it past the Executive Summary - what's next?

1.1 How to Use this Guidebook



1. If you are **ready to submit public comments** and would like to go straight to some recommended statements, sources, and types of feedback, please continue reading into Chapter 2 below for a full walkthrough.
2. If you would like **further background info** on the GHGP process, decisionmaking, and details of proposed revisions, please see the "Annex" Chapters 4-7 (you can use the Table of Contents above to jump around).
3. We **recommend** opening the guidebook in two different tabs so you can look at Chapter 2 for direct survey questions and answer suggestions while simultaneously using "Annex" Chapters 4-7 for more details as needed.
    a. Alternatively, open our answer recommendation spreadsheet to use alongside the guidebook and survey.

📌*Note*: the GHGP is updating both the location- and market-based Scope 2 accounting methodologies. This Guidebook **focuses primarily on the market-based method updates** and topics for response.

2. Respond to the Consultation

2.1 Timeline and Process

The GHGP proposed revision will now undergo a 60-day public consultation. **The deadline for commenting is December 19th, 2025.** During this period, stakeholders can submit comments through **this online form** (also linked below).

Submitting answers to the survey anonymously is an option, however EnergyTag (and the GHGP) recommend remaining public with your comments unless absolutely necessary (not using the anonymous or confidential options) for maximum transparency, legitimacy, and impact.

Chapter 2.2 below contains a full walkthrough of the relevant questions up for comment with talking points under each to help craft your own responses.

The GHGP does not expect all stakeholders to answer all questions, so leaving blanks is fine!

2.2 Consultation Questions and Suggested Responses

GHGP Consultation Survey link here. The following Sections and questions are pulled directly from the survey.

Section 3: Proposed Revisions to Definitions and Purpose of the Location and Market-Based Methods

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📌*Note: Question numbering begins at 18 to maintain consistency with the online survey. Questions 1–17 appear in the survey as the acknowledgment and demographics section. All questions and suggestion answers can also be found in our **companion spreadsheet**.*

***Q18.** Please provide any feedback on the proposal to refine the definition of scope 2, to emphasize its role within an attributional value chain GHG inventory and clarify that scope 2 must only include emissions from electricity generation processes that are physically connected to the reporter's value chain, excluding any emissions from unrelated sources? Please note that feedback on specific changes to the location- and market-based method can be provided in sections 4 and 5.*

🎯 **Recommended Answer:**

- We support the update to the scope 2 definition to ensure clarity that the emissions reported under scope 2 are from within the attributional value chain and exclude emissions related to processes outside the value chain.

- This is critical to ensure accuracy and credibility and avoid mixing attributional value-chain and consequential accounting methods.

Q19. *Please provide any feedback on the proposal to clarify the LBM definition to reflect scope 2 emissions from generation physically delivered at the times and locations of consumption, with imports included in LBM emission factor calculations where applicable? Please note that feedback on specific changes to the location-based method can be provided in section 4.*

🎯 **Recommended Answer:**

- We support the update to the LBM definition to reflect greater granularity and accuracy for these reported emissions.

Q20. *Please provide any feedback on the proposal to clarify the MBM definition to retain its existing basis, quantifying Scope 2 from contractually purchased electricity via contractual instruments, while specifying temporal correlation and deliverability when matching instruments to consumption? Please note that feedback on specific changes to the market-based method can be provided in section 5.*

🎯 **Recommended Answer:**

- We support the update to the MBM definition to reaffirm the use of contractual instruments as the basis for allocation.

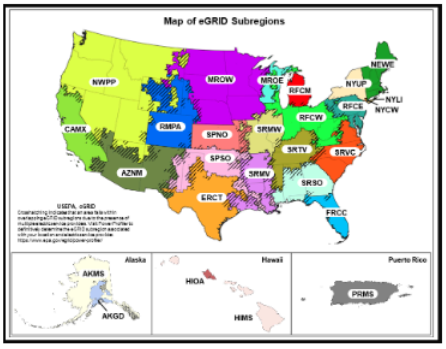
- We also support the clarification that temporal and spatial matching of instruments is a requirement for unique emissions claims as this ensures alignment with physical power grid and market realities.

📌*Note: Questions 21-68 pertain to updates to the location-based method (LBM), which have been omitted here as this guidebook is focused on updates to the market-based method (MBM).*

Section 5: Market-Based Method

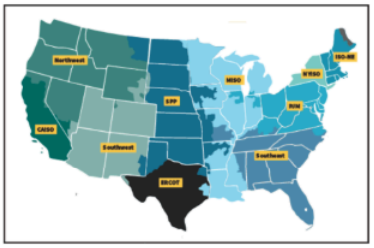
Q69. *If you have operations or experience in the US, please select your preferred deliverable market boundary for the US (Please see the table* Proposed methodologies for demonstrating deliverability *for references to these options):*

📌*Note: US market boundary options are copied below for ease of reference:*



EPA eGRID regions

DOE Needs Study Regions (45V)



Wholesale market/balancing authority

☐ *The US Environmental Protection Agency's Emissions & Generation Resource Integrated Database (eGRID)*

^Optional Selection. These market boundaries would likely be more accurate accounting for power delivery, but are more restrictive and therefore potentially less workable for reporting organizations.

☑ *DOE Needs Study Regions (45V)*

^Recommended Selection. This aligns with regulatory low-emissions hydrogen definitions in the United States and strikes a balance between greater integrity of real power flows and feasibility for organizations sourcing clean electricity near their operations.

☐ *Wholesale market/balancing authority*

☐ *Don't have operations or experience in the US*

Q70. *All respondents, please select your preferred exemption threshold per deliverable market boundary.*

☑ *5 GWhs*

^Recommended Selection. Exemption threshold per deliverable market boundary. This will still exempt the majority of companies in the world from doing hourly accounting while capturing the vast majority of electricity under a more granular, accurate accounting framework.

☐ *10 GWhs*

^Optional Selection. 10 GWhs would likely accomplish similar outcomes to the 5 GWh threshold but would exempt more organizations from hourly matching.

☐ *50 GWhs*

📌*Note: The GHGP analysis below shows the effect of various exemption thresholds:*

Impact of thresholds in select countries

Country	5 GWh Threshold		10 GWh Threshold		50 GWh Threshold	
	Companies	Load	Companies	Load	Companies	Load
Korea	42%	99.8%	35%	99.5%	20%	97.7%
Germany	43%	98.9%	35%	97.9%	14%	87.4%
France	40%	99%	31%	97.7%	14%	89.3%
South Africa	29%	99.2%	23%	98.5%	12%	94.8%
Thailand	39%	98.7%	29%	96.9%	11%	85.4%
Turkey	41%	98.8%	32%	97.2%	15%	87.3%
Peru	18%	99.2%	16%	98.8%	8%	94.8%
Iceland	20%	99.8%	13%	99.6%	10%	99.4%
Singapore	19%	97.5%	13%	95.3%	5%	84.5%

Numbers reflect the percentages of companies and load that are included under various thresholds

Source: CDP data, 2023

Q71. *On a scale of 1-5 do you support an update to Quality Criteria 4 to require that all contractual instruments used in the market-based method be issued and redeemed for the same hour as the energy consumption to which the instrument is applied, except in certain cases of exemption.*

🎯 **Recommended Answer:**

5 - Fully Support

Q72. *Please provide reasons for support, if any.*

Select all that apply:

☑ *Improves accuracy and scientific integrity of MBM results*
☑ *Strengthens transparency and supports public verification*

- ☑ *Enhances comparability across reporters and frameworks using GHG Protocol data*
- ☑ *Better reflects grid operation, reduces misallocation of generation (e.g., "solar at night")*
- ☑ *Reduces risk of greenwashing/time-shifting claims by aligning claims to time of use*
- ☑ *Improves decision-usefulness for external disclosures*
- ☑ *Helps create price signals for times and places where renewables are not already abundant*
- ☑ *Helps accelerate the development of technologies that will be needed at scale for fully decarbonized grids.*
- ☑ *Enables emission changes from storage and demand-flexibility to be reflected more accurately.*
- ☑ *Improves risk and opportunity assessment related to contractual relationships.*
- ☐ *Other (please explain)*

^Recommended Selections (select all except "Other")

Q73. *Please provide comments regarding your reasons for support.*

🎯 **Recommended Answer:**

Integrity:

- Today's methodology allows organizations to claim 100% clean electricity procurement based entirely on solar and completely uncorrelated to actual electricity consumption. The current proposal fixes that issue.

- This proposal aligns with evolving global regulations for low-carbon electricity-based products.

    - **EU Hydrogen Standard**: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32023R1184
    - **US 45V Clean Hydrogen Standard**: https://www.federalregister.gov/public-inspection/2024-31513/credit-for-production-of-clean-hydrogen-and-energy-credit

Impact:

- Hourly matching drives decarbonization by sending signals and investment direction to deploy technologies necessary to decarbonize all hours of the day.

- "*24/7 CFE EACs could also accelerate grid decarbonization, by providing time-based signals for the use of CFE and demand side response (DSR) encouraging investment and innovation. This could be particularly powerful in incentivising growth in storage solutions, like batteries, and automation of DSR, particularly if longer term trades or contracts emerge. Currently storage and DSR are unable to participate in EAC markets, as the annual granularity does not create an ability to trade these certificates in a useful timeframe.*" — **Great Britain National Energy System Operator**: https://www.neso.energy/document/365496/download

- "*Compared to yearly matching, shorter matching periods can deliver a more diverse clean energy portfolio, bringing wind, batteries and clean dispatchable capacities online in addition to cheaper solar PV.*" — **IEA:** https://www.iea.org/reports/integrating-solar-and-wind

- The proposal aligns with leading peer-reviewed research suggesting deeper, more rapid system-wide decarbonization as a result.
  - **School of Mines:** https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5447204
  - **Denmark Technical University:** https://www.sciencedirect.com/science/article/pii/S0959652624032402?via%3Dihub
  - **TU Berlin:** https://www.sciencedirect.com/science/article/pii/S2211467X24001950?via%3Dihub
  - **Princeton University:** https://www.cell.com/joule/pdf/S2542-4351(23)00499-3.pdf
  - **International Energy Agency:** https://www.iea.org/reports/advancing-decarbonisation-through-clean-electricity-procurement

Feasibility:

- Hourly matching is already the basis of power markets today. Data is widely available and becoming more available all over the world.

- Hourly matching is already demonstrated at large scale across five continents, dozens of companies, and 10s of millions of MWh.
  - **ScopeTrue**: https://scopetrue.org/case-study/

- Hourly EACs are already demonstrated, and can be scaled up globally with the right incentive structure.
  - **EnergyTag**: https://energytag.org/accredited-organizations/

- In places such as Taiwan, hourly matching has been central to energy attribute tracking systems for many years.
    - **Taiwan National Renewable Energy Certification Center**: https://www.trec.org.tw/en

- The world's leading energy attribute tracking software providers are developing hourly tracking capability, which can be ready in advance of any phase-in to hourly matching. Funding and support for this advancement is robust.
    - **LevelTen Registry Acceleration Fund Awardees**: https://www.leveltenenergy.com/post/announcing-registry-acceleration-fund-award-recipients
    - **Clean Energy Tracking Collaborative**: https://resource-solutions.org/programs/cetc/

- Matched, in the UK, shows that matching 100s of TWhs of hourly data is possible across 10s of millions of consumers with minimal computational effort.
    - **Matched Energy**: https://matched.energy/blog/matched-clean-power-index-is-live

- Suggested flexibility mechanisms, such as the use of profiles, flat loads, and existing EACs paired with production data, allow for transition as data becomes more accessible and more granular.

📌*Note: we recommend leaving Questions 74-75 blank, as they are for those who are unsupportive of more granular accounting principles.*

Q76. *Load profiles enable organizations without access to hourly activity data or hourly contractual instruments to approximate hourly data from monthly or annual data. How would the use of load profiles affect the comparability, relevance, and usefulness of MBM inventories relative to your current practice? Please describe potential advantages, limitations, and any conditions under which impacts may differ.*

🎯**Recommended Answer:**

- There is empirical evidence to suggest that using load profiles can deliver similar system-level benefits (more renewables, storage, clean firm, and demand flexibility) as actual hourly meter data while providing greater flexibility and feasibility for organizations.

- The use of profiles will still be a significant improvement in accuracy to today's accounting rules that allow the aggregation of load across an entire year to match with clean supply.
    - Princeton University: https://zenodo.org/records/14183193

Q77. *The following set of questions (77-82) applies to sites or business units above the exemption threshold, assume the default exemption conditions selected in Section 5.3.1.*

> *Who should answer: This item is optional and intended primarily for reporters (or service providers responding on behalf of a reporter/client) with direct knowledge of implementation effort and spend. If you are not preparing or overseeing a scope 2 inventory for a specific organization, you may skip this item or answer only where relevant.*

📌 *Note: we defer answers here on Questions 77-82 to respondents and reporters with knowledge of implementation effort and spend.*

Some resources on data availability, feasibility of collecting and utilizing hourly data, etc. can be found here for reference:

- **Flexidao** — Granular Electricity Meter Data Access: A Practical Guide for Corporate Clean Energy Buyers: (https://www.flexidao.com/resources/granular-electricity-meter-data-access-a-practical-guide-for-corporate-clean-energy-buyers)
- **Matched Energy** — Tracking Supplier Demand: (https://matched.energy/blog/supplier-demand-trends)
- **Matched Energy** — What Your Supplier Actually Generates (and Why It Matters For Carbon Accounting): (https://matched.energy/blog/supplier-renewable-generation)
- **Electricity Maps**: (https://app.electricitymaps.com/map/live/fifteen_minutes) Specifically, the ElectricityMaps API provides standardized hourly signals worldwide (mix, flows, carbon intensity, prices, residual mix) with historical, real-time, and forecasts; developer docs: (https://portal.electricitymaps.com/developer-hub/api/getting-started#introduction)
- **Energy Charts** — Hourly Data Availability for Germany: (https://www.energy-charts.info/index.html?l=en&c=DE)
- **SMARD (Germany)**: (https://www.smard.de/en/ueber-uns)
- UK Energy Dashboard: (https://www.energydashboard.co.uk/live)
- **ENTSO-e-Power Statistics, Total Load**: (https://transparency.entsoe.eu/load-domain/r2/totalLoadR2/show)
- **EMBER** — European Wholesale Electricity Prices: (https://ember-energy.org/data/european-wholesale-electricity-price-data/)

- **U.S. Energy Information Administration API**: (https://www.eia.gov/opendata/browser/electricity/rto/region-data)

Q83. *Update to Scope 2 Quality Criteria 5*
On a scale of 1-5 do you support an update to scope 2 Quality Criteria 5, to require that all contractual instruments used in the market-based method be sourced from the same deliverable market boundary in which the reporting entity's electricity-consuming operations are located and to which the instrument is applied, or otherwise meet criteria deemed to demonstrate deliverability to the reporting entity's electricity-consuming operations?

🎯 **Recommended Answer:**

5 - Fully support

Q84. *Please provide reasons of support, if any.*

Select all that apply:

- ☑ *Improves accuracy and scientific integrity of MBM results*
- ☑ *Strengthens transparency and public verifiability*
- ☑ *Enhances comparability across reporters and frameworks using GHG Protocol data*
- ☑ *Improves decision-usefulness for external disclosures*
- ☑ *Better reflects grid operation, reduces misallocation*
- ☑ *Provides sufficiently flexible options for organizations to demonstrate deliverability outside of the defined deliverable market boundaries*
- ☑ *Defined market boundaries reflect a boundary your organization already uses for procuring contractual instruments*
- ☑ *Agree that the proposed market boundary for my region(s) accurately reflects deliverability*
- ☑ *Agree that the defined market boundaries align with mandatory or voluntary reporting requirements in your region*
- ☑ *Improves risk and opportunity assessment related to contractual relationships*
- ☑ *Helps create price signals for times and places where renewables are not already abundant*
- ☐ *Other (please explain)*

^**Recommended Selections** (select all except “Other”)

Q85. *Please provide comments regarding your selected reasons for support.*

🎯 **Recommended Answer:**

Requiring alignment of claimed clean electricity to be matched based on a market-boundary that more accurately reflects real power markets meets the GHGP criteria of integrity, impact, and feasibility.

Integrity:

- While it is impossible to definitively track electricity from production to source, market-boundary proxies can be used to say it is *likely* that electricity generated in one area will be deliverable to consumption on the same grid.

- Power markets already use grid regions to schedule and dispatch power to meet demand - we don't need to reinvent the wheel for carbon accounting.

- Aligning scope 2 market boundaries closer to power markets increases the integrity of claims organizations make for clean electricity procurement to match consumption.

- Current market-boundaries allow claims of clean energy consumption that are detached from grid realities. For example, a factory in Germany can claim to be powered by Spanish solar, or a data center in Virginia can claim to use wind from Texas in their Scope 2 value chain. Updated market boundaries significantly improve the basic integrity of the GHG Protocol Scope 2 by aligning emissions claims with electricity system reality.

Impact:

- More accurate market boundaries will drive decarbonization impact in every region and provide new incentives for interregional transmission to demonstrate *true* connectivity between clean generators and consumption.

- Today's rules allow for clean electricity production to be claimed across clearly disconnected grid regions. This can leave regions ignored where decarbonization is more difficult or more expensive in favor of procuring clean electricity where it can be produced more cheaply.

- For example, clean energy procurement is disproportionately concentrated in Norway as lax market boundaries allow it to export cheap (< 1 USD/MWh) certificates across Europe in volumes that far exceed its ability to physically export electricity (4-5 times more in many years). In the US, Texas is the

major market for renewable procurement (40% of voluntary market sales), despite it making up much less of the country's electricity demand and having very limited interconnection to other states.

    - NREL United States Voluntary Market Analysis: https://www.nrel.gov/docs/libraries/analysis/the-state-of-the-us-voluntary-power-market-2024-data.pdf?sfvrsn=883c6642_4
    - EnergyTag's analysis on differences between certificates and actual power imports and exports: https://energytag.org/location-matters/
    - EU report explaining the current oversupply of GOs, undermining impact: https://op.europa.eu/en/publication-detail/-/publication/200c329e-5240-11f0-a9d0-01aa75ed71a1/language-en#:~:text=Publication%20metadata,Download%20and%20languages%20Close

- Wide market boundaries have tended to mean a lack of focus on the hardest (and often dirtier) grids in favor of procuring cheaper, more accessible clean power attributes from other regions. Updated market boundaries will ensure that there are incentives in place to invest in decarbonization in all markets where an organization is operating.

    - **School of Mines**: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5447204
    - **Denmark Technical University**: https://www.sciencedirect.com/science/article/pii/S0959652624032402?via%3Dihub
    - **TU Berlin**: https://www.sciencedirect.com/science/article/pii/S2211467X24001950?via%3Dihub
    - **Princeton University**: https://www.cell.com/joule/pdf/S2542-4351(23)00499-3.pdf
    - **International Energy Agency**: https://www.iea.org/reports/advancing-decarbonisation-through-clean-electricity-procurement

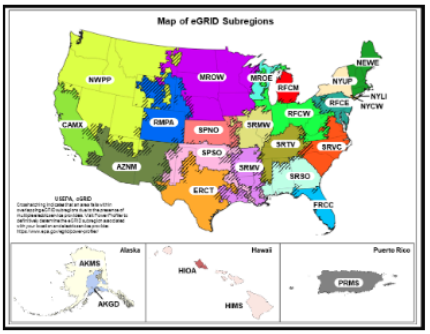
Feasibility:
These market updates are feasible. The location of production and consumption is already known; the alignment of the two will be relatively simple.

📌*Note: we recommend leaving Questions 86-87 blank, as they are for those who are unsupportive of more granular accounting principles.*

Q88. *Please answer the following questions 88-91 in regard to regions that you operate in or have experience in.*

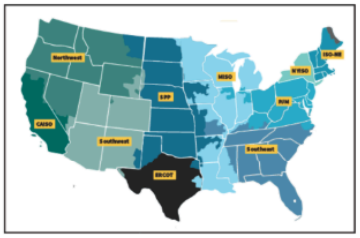
For the United States, which of the following market boundaries would best uphold the principle of deliverability and align with the decision-making criteria? (Please see the table Proposed methodologies for demonstrating deliverability *for references to these options):*

📌*Note: US market boundary options are copied below for ease of reference:*



EPA eGRID regions

DOE Needs Study Regions (45V)



Wholesale market/balancing authority

- ☐ *The US Environmental Protection Agency's Emissions & Generation Resource Integrated Database (eGRID)*
  ^Optional Selection. These market boundaries would likely be more accurate accounting for power delivery, but are more restrictive and therefore potentially less workable for reporting organizations.

- ☑ *DOE Needs Study Regions (45V)*
  ^Recommended Selection. This aligns with regulatory low-emissions hydrogen definitions in the United States and strikes a balance between greater integrity of real power flows and feasibility for organizations sourcing clean electricity near their operations.

- ☐ *Wholesale Market/Balancing Authority*
- ☐ *Unsure*
- ☐ *Other*

Q89. *If you selected options (a), (b) or (c) for question 88 please explain why this option best upholds the principle of deliverability and balances integrity, impact, and feasibility of the MBM. Please also provide comments on the relative feasibility challenges of applying the other options.*

🎯 **Recommended Answer:**

Integrity:

- The DOE Needs Study Regions align with existing regulations that require hourly and market boundary matching (45V clean hydrogen tax credit rules), do a better job than Wholesale Markets to break up some markets with consistent congestion such as MISO North and South for greater accuracy, and are otherwise quite well aligned with active power markets operating in the United States. The eGRID regions have similar advantages of providing greater accuracy, however in many instances may be too narrow to be effectively implemented.

Impact:

- These regions represent a greater representation of actual power flows within the United States and generally reduce the occurrences of congestion between paired production and consumption.

Feasibility:

- These are the regions being used for the US 45V Clean Hydrogen Tax Credit rules. They are well known and understood. They also provide a broad enough size to be workable for organizations looking to source clean energy within their region.

Q90. *For deliverable market boundaries (outside of the United States) identified in the table* Proposed methodologies for demonstrating deliverability: Deliverable Market Boundaries*, please provide comments on whether these market boundaries:*

- *appropriately reflect the deliverability of electricity in that region*
- *align with mandatory or voluntary reporting requirements in that region, please provide an example of the programmatic requirements and the impacts of these proposed changes on alignment*
- *are likely to cause any region-specific feasibility challenges (provide specific examples)*
- *If you prefer a different deliverable market boundary than identified in the table* Proposed methodologies for demonstrating deliverability: Deliverable Market Boundaries *(pages 23-25), please describe this boundary*

Please clearly identify the region you are referring to in your comments.

📌*Note: non-US regions specified in the table (AKA regions that have proposed deliverability boundaries) are Australia, Brazil, Europe, Russia, Canada, China, and Africa. Remaining regions are discussed in Q91 below.*

EnergyTag defers answers to responders with experience in these particular regions. We want to stress the overall worldwide importance of deliverability boundaries that are sufficiently aligned with power market realities, such that

they actually drive defensible, impactful, and widespread clean energy projects. However, we also recognize there will likely be a spectrum of stringency on deliverability regions - for example, Africa's 5 regions average out to over 6 million square kilometers each (by far the largest), but they also contain considerably lower load per region versus other parts of the world.

Q91. *For regions not specified in the table* Proposed methodologies for demonstrating deliverability: Deliverable Market Boundaries, *please provide examples of market boundaries that uphold the principle of deliverability and balance integrity, impact, and feasibility of the MBM.*

📌*Note: unspecified regions include Central and South America, the Middle East, and APAC (minus China and Australia).*

EnergyTag defers to regional experts for most unspecified regions. However, we stress that deliverability boundaries should reflect real power-market structures and be credible enough to ensure impact, integrity, and feasibility.

India provides a complex case. On one hand, if accepted as a single deliverability region, it would represent a massive outlier in terms of electricity load per region (nearly 1600 TWh annually). This could risk weakening the stringency and perceived credibility of the deliverability principle, especially when compared with other regions in the GHGP table. For more granular integrity, boundaries aligned with India's historical regional grids (e.g. North, South, West, East, Northeast) may offer a better balance between feasibility and impact.

That said, India's current power market design clearly qualifies it as a single bidding zone under the GHGP's deliverability criteria:

- *It operates one of the world's largest synchronous grids ("One Nation, One Grid, One Frequency").*
- *Since 2013, all regions have been fully interconnected.*
- *Over 99.98% of traded electricity in power exchanges clears at a single national price, with minimal congestion.*
- *Transmission access is non-discriminatory under the General Network Access (GNA) regime.*
- *There is real physical deliverability across the country and uniform price discovery every 15 minutes.*

Therefore, India currently meets the GHGP criteria for market boundary eligibility, even though it raises legitimate concerns about scale. This underscores the need for context-specific judgment in applying deliverability rules - maintaining feasibility for key emerging markets, without compromising claim integrity.

📌*Note: EnergyTag defers answers to Questions 92-96 to GHGP reporters and service providers.*

Q97. *New guidance for Standard Supply Service (SSS)*
On a scale of 1-5 do you support the new guidance for Standard Supply Service (SSS) and requirement that a reporting entity shall not claim more than its pro-rata share of SSS.

🎯**Recommended Answer:**

4 - General Support[3]

Q98. *Please provide reasons of support, if any.*

Select all that apply:

- ☑ *Helps ensure that SSS resources are fairly allocated to all consumers and prevents procurement by specific organizations*
- ☑ *Clarifies the order of operations so that organizations may claim SSS first and then make voluntary procurements*
- ☑ *Supports consistent treatment of shared supply across different market structures*
- ☑ *Protects the integrity of market-based accounting by avoiding double counting of attributes from SSS*
- ☐ *Other (please explain)*

^**Recommended Selections** (select all except “Other”)

Q99. *Please provide comments regarding your selected reasons for support.*

🎯**Recommended Answer:**

Integrity:

- There are integrity concerns with accounting that permits one company or set of consumers to claim to consume a disproportionate amount of clean

[3] Note that EnergyTag recommends a general position of support for SSS, but there needs to be credible and effective **backstops** in the case that SSS cannot be implemented immediately. This third pillar — in combination with hourly and deliverable market boundaries — is critical; therefore, comments should stress the need for a strong, workable requirement here that will help drive new projects as a key element of Scope 2 accounting.

power from existing assets (e.g. an old hydro plant) that have been paid for also by others (e.g residential consumers).

- SSS aims to prevent this “resource shuffling” ensuring companies can only claim their fair share of existing clean electricity.

Impact:

- Research suggests that hourly and locational matching plus an incrementality requirement are all required together to drive the greatest impact of different procurement options.
    - **Denmark Technical University**: https://www.sciencedirect.com/science/article/pii/S0959652624032402?via%3Dihub
    - **Princeton University**: https://zenodo.org/records/7082212

- The Standard Supply Service proposal is a way of accurately apportioning clean electricity already on the grid and driving incentives of new clean electricity on top of that.

- Standard Supply Service attempts to fairly allocate resources that are being supported by all ratepayers within a given market region. This will help ensure no organization claims 100% clean electricity procurement based on long-existing, publicly funded, rate-based, and similarly less-impactful clean assets.

Feasibility:

Robust and clear implementation of SSS will be crucial to it having sufficient integrity and impact. In particular, ensuring adequate and clear classification of which assets are in SSS. A global registry would enable this, for example.

Q100. *Please provide reasons of concern, if any.*

Select all that apply:

📌*Note: EnergyTag recommends using this section to clarify the importance of a strong backstop or alternative to the SSS proposal in the case that implementation challenges persist or it takes time to scale a global registry necessary for ideal implementation of the SSS.*

- ☐ *Markets should self-determine how resources that fall under SSS are allocated to customers*
- ☑ *Concern of regionally applicable challenges to implementation*
- ☑ *Unclear how partial subsidies affect SSS classification*

☑ *Unclear rules/definition of SSS*
☐ *All contractual instruments should be eligible for voluntary procurement.*
☐ *Other (please explain)*

Q101. *Please provide comments regarding your selected reasons for why you are not supportive.*

🎯 **(Optional) Recommended Answer:**

- Incrementality, or the incentive to drive new clean electricity onto the grid, is a key element of updates to scope 2 accounting standards.

- The Standard Supply Service currently serves as the incrementality pillar of this proposal. However, the proposal has some challenges: it is currently open ended, potentially difficult to implement across markets around the world, and not as impactful as other incrementality considerations.

- Due to these concerns, we think it is critical to have an alternative incrementality pillar definition to be in force before the SSS can be fully implemented or as a backstop in the case of broader implementation challenges.

- An asset age limit could be considered as quality criteria for clean electricity claimed under scope 2 emissions reporting. Under this criteria, any generator that began producing electricity (or has been repowered) more than a certain number of years *before* the first year in which their attributes are claimed would not qualify. For example, an organization could claim clean electricity procurement from new wind and solar for their lifespans to match consumption, but would not be able to claim the emissions attributes from very old low-carbon resources.

- The Climate Group's 24/7 Technical Criteria (https://www2.theclimategroup.org/247-technical-criteria-May-2025, page 16) use an asset age of 15 years to ensure continuous demand for new clean production. This criteria also includes important exemptions to this rule such as for the first offtakers of projects and allowances for procurement up to the percentage of pre-existing CFE on the local grid, which are important considerations for the GHGP scope 2 standard to consider.

📌*Note: Questions 102-103 ask for additional feedback on resources that should or should not be allocated via SSS. EnergyTag defers to relevant responders on these questions.*

Q104. *Proposed examples of SSS include 'facilities and/or supply that are subject to regulated cost recovery from a monopoly supplier as part of default service in a particular service area and are not part of a resource-specific supplier product (e.g. a green tariff)'. In this context, should a monopoly supplier include:*

Select all that apply:

- ☑ *Vertically integrated investor-owned utility*
- ☑ *Government entity operating in a service area without supplier choice*
- ☑ *Distribution utility in a restructured market where certain electricity supply and/or contractual instrument purchases are subject to non-by passable, regulated cost recovery*
- ☐ *Other (please explain)*
- ☐ *Unsure*

^Recommended Selections. (select all except "Other" and "Unsure")

📌*Note: Question 105 is optional; it merely provides additional space for comments regarding your answers to Question 104.*

Q106. *Allocation of SSS requires either suppliers allocating their SSS resources to customers or the development of a credible centralized registry or third-party registries that track SSS in order for organizations to claim their share. Is it acceptable that some reporters may be unable to claim SSS prior to a credible centralized registry or third-party registries being established? If not, how else might SSS be allocated in the absence of a registry?*

🎯**Recommended Answer:**

- If no credible centralized registry or third-party registry is operating to track and assist in SSS allocation, and a supplier is not taking steps to allocate SSS resources, there are serious integrity risks that a reporting organization may seek to make above-fair claims for attributes of clean electricity generation that otherwise *should* be allocated to SSS (where only pro-rata claims are allowed).

- In this instance, it would be highly appropriate to implement a vintage requirement, in which certain resources could be automatically qualified as SSS based on asset age (the year of commissioning or repowering). Much like fossil mixes serving as an easy and conservative backstop to residual mixes, vintage requirements could serve this role for SSS allocation -

ensuring higher integrity than allowing for claims to be made on all available clean electricity generation within a market boundary.

- Another way to meet similar goals is to put in place an upper limit for companies procuring assets of older than 15 years (or whatever asset age limit is chosen). This upper limit would be the percentage of existing baseload CFE in a given grid mix. This is similar to how the Climate Group 24/7 Technical Criteria operates. (https://www2.theclimategroup.org/247-technical-criteria-May-2025)

Q107. *Would you support a default option in cases where SSS data is not supplied by electricity providers, and no third-party registry is available, to designate certain resources as automatically qualifying as SSS?*

🎯 **Recommended Answer:**

- Yes, certain resources could be automatically qualified as SSS based on an asset-age limit for the year of commissioning or repowering.

- Additionally, government-owned projects and assets being used for compliance claims (such as a state Renewable Portfolio Standard) could be automatically added to the SSS.

- Without a highly credible registry of these assets, an asset-age limit or a baseload CFE percentage of the local grid mix remains a strong backstop to limit procurement of generation that should be more broadly allocated to all users.

📌*Note: we recommend leaving Question 108 blank, as it is for those who are unsupportive of more granular accounting principles.*

Q109. *If you answered "yes" to question 107, which of the following criteria, if any, would you support as a method of designating resources as SSS.*

Select all that apply:

- ☑ *Project age*
- ☑ *Technology or fuel type*
- ☑ *Project ownership (e.g. government owned projects)*
- ☑ *Projects tracked in compliance registries*

☑ *Combination of above criteria*
☐ *Other (please specify)*
^Recommended Selections (select all except “Other”)

📌*Note: Question 110 is optional; it merely provides additional space for those selecting “Other” in Question 109.*

Q111. *If SSS is not uniformly available across regions, how would this affect comparability of scope 2 MBM reporting? What interim solutions or disclosures would reduce inconsistency?*

🎯**Recommended Answer:**

- An asset age limit could help reduce inconsistency and improve comparability across regions.

- Asset age limits are commonly used in regulations implementing similar granular accounting measures which can also help with applicability of GHGP standards.

📌*Note: Question 112 is optional; it merely provides additional space for general feedback regarding SSS.*

Q113. *Updated definition of residual mix emission factors*
On a scale of 1-5 do you support the updated definition of residual mix emission factors to reflect the GHG intensity of electricity, within the relevant market boundary and time interval, that is not claimed through contractual instruments, including voluntary purchases or Standard Supply Service allocations?

🎯**Recommended Answer:**

5 - Fully support

Q114. *Please provide reasons of support, if any.*

Select all that apply:

☑ *Establishes clear definition for residual mix emission factors*

- ☑ *Improves accuracy and relevance of market-based reporting*
- ☑ *Protects the integrity of market-based accounting by avoiding double counting of attributes within the MBM*
- ☑ *Clarifies the market boundary a residual mix emission factor should be calculated for*
- ☑ *Improves comparability and transparency across organizations and regions*
- ☑ *Helps incentivize voluntary sourcing of contractual instruments*
- ☑ *Provides an option for reporters without access to an hourly residual mix emission factor*
- ☐ *Other (please explain)*

^Recommended Selections (select all except "Other")

Q115. *Please provide comments regarding your selected reasons for support.*

🎯 **Recommended Answer:**

- Besides the specified reasons selected in Question 114, we clarify our support for the move from average emissions factors (which would result in double-counting of some clean energy) to residual mixes with fossil mix backups.

📌*Note: we recommend leaving Questions 116-117 blank, as they are for those who are unsupportive of more granular accounting principles.*

📌*Note: Questions 118-123 are looking for feedback on the availability of residual mix emissions factors across global markets. EnergyTag defers to relevant responders on these questions.*

Q124. *Provide new requirement for use of fossil-based emission factors*
On a scale of 1-5, do you support the requirement that for any portion of electricity consumption not covered by a valid contractual instrument and where no residual mix emission factor is available, a reporter shall apply a fossil-based emission factor?

🎯 **Recommended Answer:**

5 - Fully support

Q125. *Please provide reasons for support, if any.*

Select all that apply:

- ☑ *Helps improve accuracy and scientific integrity of MBM by reducing the risk of double counting of carbon free electricity*
- ☑ *Provides an option for reporters without access to a residual mix emission factor*
- ☑ *Incentivises development and publication of residual mix emission factors by requiring use of a more conservative emission factor as a fallback option*
- ☐ *Other (please specify)*

^Recommended Selections (select all except "Other")

Q126. *Please provide comments regarding your selected reasons for support.*

🎯 **Recommended Answer:**

- Residual mixes are not always available to reporting organizations. Instead of allowing for use of a grid average default emissions factor for unmatched hours of consumption, which would double count significant clean electricity already being claimed by others, a fossil mix ensures no double counting of these clean electricity attributes and is easily attainable.

📌 *Note: we recommend leaving Questions 127-128 blank, as they are for those who are unsupportive of more granular accounting principles.*

Q129. *Please provide feedback regarding whether the requirement to apply a fossil-based emission factor, where no residual mix emission factor is available, should incorporate global equity considerations given the different levels of residual mix emission factor data available globally? And if so, how?*

🎯 **Recommended Answer:**

- The lack of residual mix emission factor and the required use of a fossil-based emission factor will incentivize the development of a residual mix emission factor to support greater transparency of unclaimed clean electricity being supplied to users.

- Without that information, only a fossil-based emission factor is appropriate to apply to unmatched consumption for a more conservative calculation and to avoid double counting.

Q130. *Combined questions on updates to the market-based method*
The following questions refer to the complete set of proposed market-based revisions and feasibility measures, inclusive of:

- *Hourly matching requirement*
- *Deliverability requirement*
- *Standard supply service*
- *Updated guidance on residual mix factors*
- *Fossil-based emission factor default*
- *Threshold exemptions*
- *Legacy clause*
- *Phased implementation*

Responses to questions should focus on the impact of these combined revisions, and not specific components of the market-based revision. Please assume the default exemption conditions selected in Section 5.3.1

Are the proposed feasibility measures (e.g., use of load profiles for matching, exemptions to hourly matching, legacy clause, and phased implementation) sufficient to support implementation of the proposed market-based revisions at scale?

- ☐ *1 - Insufficient*
- ☐ *2 - Somewhat sufficient*
- ☐ *3 - Sufficient*
- ☐ *4 - Moderately sufficient*
- ☑ *5 - Highly sufficient*
  ^Recommended Answer
- ☐ *No basis to assess*

📌*Note: Questions 131-133 are looking for additional feedback on feasibility measures. EnergyTag defers to relevant responders on these questions.*

📌*Note: Questions 134-145 are looking for feedback on investor and assurance needs and financial reporting implications. EnergyTag defers to relevant responders on these questions.*

Q146. *The following section of questions focuses on principle-based considerations for the reporting of emissions associated with electricity within and outside of the scope 2 inventory.*

Considering the full set of proposed revisions to the market-based method as discussed previously in this consultation, would the existence of a separate metric outside of scope 2 to quantify the emissions impact of electricity-related actions change your perspective on the proposed revisions?

- ☐ *Yes*
- ☐ *Somewhat*
- ☑ *No*

^Recommended Response. The development and existence of an impact metric outside of Scope 2 should not change the value and importance of the changes proposed to Scope 2 inventory accounting under GHGP.

- ☐ *I do not support the development of impact metrics outside the scope 2 inventory*.

^This answer may also be one some organizations choose. There is evidence that an impact metric is overly complicated to estimate and therefore will not be a useful addition to planning, procurement, and claims even if outside scope 2 inventory accounting.

📌*Note: we recommend leaving Questions 147-148 blank, as they are for those who are unsupportive of more granular accounting principles.*

Q149. *If you answered "no" to question 146, please explain why a separate impact metric for electricity projects does not change your view of the proposed market-based inventory revisions.*

🎯**Recommended Answer:**

- Whether or not a separate impact metric is developed and made available to reporting organizations, it is still critical that the inventory market-based scope 2 method adopt the proposed changes.

- The scope 2 method provides unique transparency into the emissions associated with an organization's procured electricity inventory. Today's scope 2 method does not provide the transparency, integrity, or impact necessary to achieve deeper grid decarbonization. As outside regulations, policies, and target-setting bodies look to the GHGP for guidance on how to account for scope 2 electricity emissions, it is critical these updates

reflect the best academic evidence and potential impact while balancing feasibility.

- An outside impact metric cannot offer the same true decarbonization signals and incentives on every grid in which organizations operate, as it is a fundamentally different question of estimating how one action in one time and place changes the world from an unobserved counterfactual. This is then compared to other actions in another place and time. There is missing alignment between these actions which do not drive true deep decarbonization of the grid.

- The impact metric must meet the following criteria to be useful and trustworthy as an estimate of avoided and induced emissions as intended:

- Additionality:
    - Impact metrics will allow for a comparison between emissions induced by electricity usage on one grid with emissions avoided by actions taken on another grid at another time. In this kind of dynamic, it is absolutely essential that the action being taken to reduce emissions elsewhere is evaluated with a strict additionality test.

- Transparent methodology for estimating emissions impacts:
    - The methodology rests on estimating emissions that are being compared to a counterfactual world. This means there will always be uncertainty. The formulas and models used to make these estimations must be transparent and repeatedly publicly reviewed for accuracy to ensure public trust and usefulness to companies.

- Continued clarity that this metric is not comparable to or intertwined with market-based inventory accounting:
    - Market-based inventory accounting is distinctly different from an impact metric, and the two should remain separated for reporting purposes. The GHGP has made it clear that these processes will be unaffected by the other and the use of these methodologies in any target-setting or regulatory instance is not for GHGP to decide.

Q150. *If you answered "I do not support the development of impact metrics outside the scope 2 inventory" to question 146, which of the following rationale captures your views?*

Select all that apply:

- ☑ *There is no agreed-on methodology for calculating these impact metrics*
- ☐ *The existence of impact metrics would divert investment from time-matched and deliverable electricity procurement*
- ☐ *These metrics are not currently required in mandatory disclosure frameworks*
- ☐ *These metrics are not currently part of target setting programs*
- ☑ *These metrics may not be appropriately auditable*
- ☑ *These metrics could result in greenwashing*
- ☐ *Other (please specify)*

^Recommended answers *if you selected "I do not support" on Question 146*

📌*Note*: EnergyTag does not believe that investments made outside of time-matched and deliverable procurements are inherently something to oppose, as long as Scope 2 inventory accounting is still performed and communicated transparently on a granular (hourly and deliverable-based) level. The lack of inclusion of an impact metric in disclosure frameworks and target setting programs today is not in and of itself a justifiable reason to exclude the development of such a metric.

Q151. *Please provide comments regarding your selected choices in question 150.*

📌*Note:* If you answered Question 150, here are some potential justifications for the lack of methodology, difficulty in auditing, and potential result of greenwashing using such a metric:

🎯 **(Optional) Recommended Answer:**

- To date, there has not been a proposed impact methodology that satisfactorily meets the combined GHGP metrics of integrity, impact, and feasibility.

- **"Short-run Marginal Emission Rates Omit Important Impacts Of Electric-sector Interventions":** https://www.pnas.org/doi/10.1073/pnas.2211624119
    - *"Short-run metrics do not do so, and by neglecting induced structural change, they can erroneously estimate the consequences of actions. This undermines the promise of marginal emission rates to support decision-making, distorting the selection between alternatives based on their impacts."*

- **“Moving Beyond Marginal Carbon Intensity: A Poor Metric for Both Carbon Accounting and Grid Flexibility” (TU Berlin Paper):** https://arxiv.org/pdf/2507.11377
    - *"We conclude that MCI (Marginal Carbon Intensity), despite its conceptual appeal, does neither capture the needs of carbon-aware approaches focused on reducing Scope 2 emissions (a clear, transparent, and verifiable methodology) nor of efforts to optimize grid efficiency...However, recent proposals for time- and location-granular renewable energy certificate markets aim to create more accurate, standardized signals. If adopted, these could support carbon-aware scheduling by aligning emissions impact with financial incentives."*

- **“From Power Markets to Reality: Does the Marginal Power Plant Really Exist?”:** https://www.electricitymaps.com/content/from-power-markets-to-reality-does-the-marginal-power-plant-really-exist
    - *“Indisputably, the marginal signal holds the theoretical power to represent emissions physically caused when more electricity is requested. However, this concept does not translate well to the reality of grid operations. It is trying to force a simplified picture onto an exceedingly complex system and is bound to be inaccurate because of that.”*

- **“The Once in a Generation Chance to Fix Corporate Emissions Reporting”:** https://www.nrdc.org/bio/pete-budden/once-generation-chance-fix-corporate-emissions-reporting
    - “*On the other hand, some large companies, led by Amazon and Meta, have recently joined forces as the Emissions First Partnership (EFP). They propose that a company should be able to claim zero Scope 2 emissions by offsetting their own emissions with dubious claims for emissions reductions elsewhere, at any other place and time. The proposal uses emissions estimates often referred to as “marginal emissions,” referring to the emissions impacts of whichever electricity generator is ramping up or down in response to real-time demand changes. Unfortunately, there are some critical issues with this proposal that would create or expand loopholes to let the biggest corporations off the hook for their emissions, right at a time when it is critical to hold them to account.”*

- **“Big Tech is Pushing a New Offsetting Scheme to Hide its Fossil Spending Spree”:**

https://www.linkedin.com/pulse/big-tech-pushing-new-offsetting-scheme-hide-its-fossil-ketan-joshi-uqzmf/?trackingId=t65%2BddenXkzVp2wtlYOlFw%3D%3D

- *"The latest update from the GHG protocol's process is a mixed bag. While they seem to be leaning towards somewhat improving the existing methods, they are musing over whether to allow this 'avoided emissions' offsetting approach as a separate line item in accounts. "This new impact-based metric, Marginal Emissions Impact, is designed to reflect how much a clean energy purchase displaces fossil fuel emissions on the grid...It is important to point out that this is essentially nothing more than the recreation of the now ancient system of carbon offsets created from the construction of renewable energy facilities. These offsets have specifically been implicated in the worst types of fraud and exaggeration, because they largely related to sites that essentially would have been constructed anyway. Despite widespread recognition of their worthlessness in climate claims, they are still widely used."*

Q152. *In your view, balancing scientific integrity, climate impact, and feasibility, what scope 2 revisions or combination of revisions are most appropriate? Please address each of the three core decision-making criteria: integrity, impact, and feasibility in your answer, and describe how the approach satisfies each criterion.*

🎯 **Recommended Answer:**

Integrity:

- Hourly accounting, market boundaries reflecting power grid realities, and an incrementality standard (SSS or similar) are critical to ensuring Scope 2 accounting moves forward with transparency and credibility.

Impact:

- The combination of these pillars within the Scope 2 standard are key to a higher integrity system that drives real decarbonization impacts via targeted investments in new technologies, the incorporation of storage to timeshift renewables, and real incentives for demand flexibility.
  - Princeton University / TU Berlin / Google, *24/7 Carbon-free Electricity Matching Accelerates Adoption of Advanced Clean Energy Technologies*: https://www.cell.com/joule/pdfExtended/S2542-4351(24)00544-0
  - Transition Zero, *Modelling 24/7 Carbon Free Electricity (CFE) in India*: https://blog.transitionzero.org/hubfs/Analysis/CFE%20Reports/TransitionZero%20-%2024-7%20CFE%20Report%20-%20India.pdf

Feasibility:

- Between load exemptions for hourly matching, alternative methods for meeting market boundary requirements, the use of load profiles and estimates when more accurate data is unavailable, a phased timeline for implementation, and annual residual mixes or fossil-only mixes for unmatched hours — this proposal is highly feasible.

- At the most basic level, organizations should be able to instantly create flat load profiles using existing monthly and annual data. That is eminently feasible *and* represents an improvement from today's status quo accounting.

- Organizations that would be required to do hourly accounting across their operations are ones with access to greater resources and are likely tracking power purchases and usage at a highly granular level already.

- Their efforts in implementing this proposal will support the development of systems, tools, and strategies to help other organizations without the same resources follow in their footsteps and begin to adopt higher and higher integrity accounting and procurement practices over time. In this way, the proposed changes are a requirement on the organizations that can manage this change after a phase-in and offer a leadership opportunity for all other organizations.

Section 6: Exemptions - Hourly Matching Exemption Threshold

Q153.

Option 1. *Companies with annual consumption up to [X] GWh/year in a deliverable market boundary may use a monthly or annual accounting interval for Criteria 4 for all operations within that market boundary in accordance with the contractual instruments temporal data hierarchy.*

Option 2. *Companies that meet the small and medium company categorization may use a monthly or annual accounting interval for Criteria 4 for all operations within that market boundary in accordance with the contractual instruments temporal data hierarchy.*

Option 3*. Companies with annual consumption up to [X] GWh/year in a deliverable market boundary or meet the small and medium company categorization may use a monthly or annual accounting interval for Criteria 4 for all operations within that market boundary in accordance with the contractual*

instruments temporal data hierarchy.

***Option 4**. Companies with annual consumption up to [X] GWh/year in a deliverable boundary and meet the small and medium company categorization may use a monthly or annual accounting interval for Criteria 4 for all operations within that market boundary in accordance with the contractual instruments temporal data hierarchy.*

On a scale of 1-5 do you support allowing for exemptions to hourly matching using one of the options (1-4) described above?

🎯 **Recommended Answer**:

4 - General Support

Q154. *Please provide your reasons for support, if any.*

Select all that apply:

- ☑ *Reflects a reasonable balance of integrity, impact and feasibility as organizations under a threshold collectively contribute to fewer Scope 2 emissions than the largest consumers*
- ☑ *Encourages organizations under a threshold to continue to engage in voluntary procurement using an annual procurement approach*
- ☑ *Provides a more equitable approach for reporting as hourly matching could be more challenging for organizations under a threshold*
- ☑ *Reduces transition strain on the electricity market and hourly matching infrastructure*
- ☑ *Other (please provide)*

  ^Recommended Answer. Select all, and recommend sharing the following for Other: Allowing exemptions also encourages the organizations with the resources (and a much higher impact on overall electricity consumption) to help pave the way for markets and infrastructure so that companies with fewer resources (and a lower overall electricity consumption impact) can start to take leadership efforts.

📌 *Note: Questions 155-158 provide additional space for responders to voice support and concerns regarding exemptions.*

Q159. *Load-based exemption threshold*

Options 1, 3, and 4 introduce a GWh load threshold applied within a defined boundary. In section 5.3.1 question 70 you selected an exemption threshold of either of 5, 10, or 50 GWh per deliverable market boundary. If you prefer a GWh load threshold based on a different amount, propose a single threshold amount in GWh per boundary and explain why.

a. Threshold [enter number] GWh per [deliverable market boundary/site/other]
b. Preferred option selected in section 5.3.1, question 70

🎯 **Recommended Answer:**

- Reaffirm the preferred option you selected in Question 70: likely 5 or 10 GWh.

📌*Note: we recommend leaving Question 160 blank, as it is for those recommending alternative threshold amounts.*

Q161. *Exemption options 2, 3, and 4 introduce a criterion based on a reporter meeting the small and medium company categorization. This categorization framework is being developed by the Corporate Standard Technical Working Group. What specific criteria should be considered to define Small and Medium Companies?*

Select all that apply:

- ☐ *Number of employees*
- ☑ *Net annual turnover*
- ☑ *Balance sheet*
- ☑ *Emissions (scope 1 + LBM scope 2)*

  ^Recommended Selections
- ☐ *Company location (high and upper-middle income countries and low- and lower-middle income*
- ☐ *countries)*
- ☐ *Other (please explain)*

Q162. *Please provide any additional comments regarding the criteria to define Small and Medium Companies.*

🎯 **Recommended Answer:**

- Criteria to define Small and Medium Companies must be robust and verifiable (likely hard-numerical and publicly available) to avoid vague definitions or gaming of exemptions.

- Criteria must also be sufficiently indicative of company size and impact, and thus financial or emissions-based definitions could be good criteria.

- Criteria should not be simply based on where an organization is based. Countries that may be considered low- and lower-middle income do not always effectively align with the regional maturity of the clean energy market or the sophistication and resources of the organization located there.

Q163. *Which of the four draft eligibility options for an exemption to hourly matching reflect the most reasonable balance of integrity, impact and feasibility of the MBM? Apply the exemption threshold selected in question 159.*

- ☐ *Option 1*
- ☐ *Option 2*
- ☐ *Option 3*
- ☑ *Option 4*
  ^Recommended Selection
- ☐ *None of the above (please explain)*

📌*Note: Questions 164-165 are for those dissatisfied with the exemption options presented.*

Q166. *Should exemptions be time-limited (i.e. phased-out over time) or ongoing?*

- ☑ *Time-limited (i.e. phased out over time)*
  ^Recommended Selection
- ☐ *Ongoing*
- ☐ *Unsure*
- ☐ *Do not support exemptions*

Q167. *If you selected that exemptions should be time-limited in question 166, please explain how this phase-out should be implemented and why this*

suggestion fits the intent of the exemption (i.e., reducing reporting burden while maintaining integrity and impact of the MBM).

🎯 **Recommended Answer:**

- The exemption provision provides a useful reduction in reporting burden for small companies to ensure widespread participation while still covering the vast majority of voluntary claims with hourly matching requirements for the largest energy users. This thoughtful balance also ensures that at a certain time in the future — for example, 10 years post phase-in — suppliers and registries would become far more accustomed to supporting hourly matching by then, and the accessibility level of hourly procurement, information, and reporting will have gone down substantially.

- Just as voluntary procurement under current GHGP rules has evolved and grown substantially over the past 10 years, granular procurement under the new paradigm can similarly progress. Therefore, the exemption provision to the new rules should incorporate a forward-thinking phase-out provision to transition from burden minimization to integrity and impact maximization as the global voluntary market evolves. It's also worth noting that in that future, load profile measures could still potentially exist as a very feasible backstop.

- As an example, say the new proposal phases in through 2030 - the exemption provision would then phase out by 2040, which is 15 years from now. This is lots of time for reporters, suppliers, and registries of all sizes to have advanced, and it's a time by which the world must be thinking far more seriously about the last mile of power sector decarbonization.

Q168. *Aside from any suggestions provided in question 167, please describe any safeguards needed to ensure exemptions are not misused and that comparability across reporting organisations is maintained?*

🎯 **Recommended Answer:**

- Besides what is described in the answer to question 167, another crucial guardrail is keeping this exemption at the market boundary level and not site-specific. A site-specific threshold can encourage gaming by dividing up consumption into many different "sites" to secure the exemption, and is also a disincentive for greater electrification — something we would like to generally encourage.

Q169. *In exercising the exemption, should the organization be considered in conformance with the Corporate Standard and Scope 2 Standard?*

- ☐ *Yes, organizations using the hourly matching exemption should be considered in conformance*
- ☐ *No, organizations using the hourly matching exemption should NOT be considered in conformance*
- ☑ *A separate conformance level should be defined for companies exercising the exemption*
  ^Recommended Selection.
- ☐ *Unsure*
- ☐ *Other (please explain)*

Q170. *Please provide any additional comments regarding your response to question 169.*

🎯 **Recommended Answer:**

- There should be no penalty for organizations that exercise the exemption, however for comparability and transparency it should be made clear that those accounting for their Scope 2 emissions using the exemption represent a very different accounting method and procurement strategy to achieve what may look like similar outcomes.

- Exempt companies should get due credit, but there should be clear explanations to convey the less robust procurement standard they are using when compared to non-exempt companies.

Section 7: Legacy Clause Considerations

Q171. *On a scale of 1-5 do you support introduction of a Legacy Clause to exempt existing long-term contracts that comply with the current Scope 2 Quality Criteria from being required to meet updated Quality Criterion 4 (hourly matching) and Quality Criterion 5 (deliverability)?*

🎯 **Recommended Answer**:

4 - General Support

Q172. *Please provide your reasons for support, if any.*

Select all that apply:

- ☑ *Reflects a reasonable balance of integrity, impact and feasibility as existing long-term contracts reflect significant financial and operational commitments to energy resources*
- ☑ *Encourages organizations with legacy contracts to continue to engage in voluntary procurement using an annual procurement approach*
- ☑ *Provides a more equitable approach by ensuring that early adopters of Scope 2 Guidance are not disadvantaged*
- ☑ *Helps maintain trust and market confidence in long-term contracts*
- ☑ *Provides a pragmatic pathway for organizations to transition to updated Quality Criteria*
- ☐ *Other (please provide)*

^Recommended Selections (select all except "Other").

📌*Note: Question 173 provides additional space for comments in support of a legacy clause, and Questions 174-175 are for those who do not support a legacy clause.*

Q176. *Which date should determine a contract's eligibility under a Legacy Clause?*

- ☑ *Contract signed prior to implementation date of the Scope 2 Standard (post phase-in period)*

  ^Recommended Selection.
- ☐ *Contract signed prior to publication date of the Scope 2 Standard*
- ☐ *Other (please explain)*
- ☐ *Do not support Legacy Clause*

📌*Note: Question 177 provides additional space for comments regarding your answer to Question 176 above. Important design elements and concerns are addressed in upcoming questions.*

Q178. *If a Legacy Clause is included, please provide comments on the following design elements to balance integrity, impact, and feasibility of the MBM. Respond only to items relevant to your context.*

📌*Note: Below are recommended answers for each question related to treatment of contractual instruments potentially receiving legacy treatment. EnergyTag generally recommends stressing the following points about the implementation of a legacy clause:*

- *Contractual instruments receiving legacy status must remain with the original offtaker and should not be used in secondary markets to circulate instruments with legacy benefits.*
- *The potential for an increase in demand of contractual instruments to qualify for legacy treatment can have a positive impact if it drives further incentive to deploy clean projects quickly.*
- *A final end date for legacy clause exemptions should be put in place to avoid gaming in which an organization seeks to procure contractual instruments far out into the future with the intent of using them to make claims using previous accounting rules.*
- *Transparency is critical for which contractual instruments are being used under which quality criteria and Scope 2 rules.*

a) Eligibility by instrument type and term: Define which instruments qualify (e.g., PPAs, utility green tariffs, supplier-specific contracts, unbundled certificates) and any minimum original term, including treatment or eligibility of perpetual or undefined-term contracts.

🎯 **Recommended Answer:**

- The legacy clause is a very important provision for honoring existing commitments, but it also must be said that it presents significant risk of diluting GHGP integrity if not administered properly.

- Long-term, fixed price PPAs are the highest integrity and impact legacy contracts and should receive high qualification, while on the other end of the spectrum, we should not allow a glut of legacy unbundled RECs to circulate the market for decades to come, as they have already been shown to be less impactful even under current GHGP rules.

b) Duration of legacy treatment: Specify the time limit or maximum remaining term after which updated Scope 2 Quality Criteria apply to all contracts.

🎯 **Recommended Answer**:

- The legacy clause should apply to contracted procurement for up to 10 years after execution of the contract.

c) Allocation rules to prevent legacy contractual instruments being used to target the most challenging hours or locations.

🎯 **Recommended Answer**:

- Proportional allocation must be used for any legacy contracts used to do annual or monthly matching. A volume of electricity being claimed under the legacy clause can be proportionally allocated to each hour of consumption, and for all other volumes of consumption must be matched with hourly and market boundary appropriate procurement.

- The legacy contracts must also be allocated across consumption within the market boundary previously used under scope 2 rules before the newest quality criteria was defined. These contractual instruments should be allocated on a pro-rata load basis.

d) Transfers and resale requirements when legacy instruments are sold or transferred to third parties.

🎯 **Recommended Answer**:

- Legacy instruments must not be transferred or transacted beyond the original offtaker.

e) Extensions and amendments: Define how contract extensions or material amendments after the cutoff affect eligibility (e.g., whether the extended or modified portion is treated as a new contract subject to updated Scope 2 Quality Criteria).

🎯 **Recommended Answer**:

- An extended or amended contract must abide by the updated Scope 2 quality criteria; there must be no “legacy clause” for previously legacy claused contractual instruments.

f) Disclosures: Scope and granularity of disclosures for any use of a Legacy Clause (for example separate presentation of MBM results with and without legacy-treated instruments, percentage of contracts covered, share of load covered, expected end date of legacy status).

🎯 **Recommended Answer**:

- For transparency, all use of legacy contractual instruments should be clarified as to how they are claimed, what percentage of load is being matched with legacy contractual instruments, and what geographies are chosen to match legacy contractual instruments with consumption.

g) Pre-effective-date guardrails: Approaches to discourage contracting intended solely to expand legacy eligibility before the cutoff (for example, disclosure of execution date and negotiation timeline).

🎯 **Recommended Answer**:

- As long as the legacy clause's other design parameters are not overly permissive (i.e., diluting the integrity of reporting claims made after the rules updates), we do not have a problem with inciting a high-demand period of contracting under existing GHGP rules prior to the effective date.

h) Global equity: Approaches to address regional concentration of eligible contracts and related equity considerations.

🎯 **Recommended Answer**:

- Regional distribution of contractual instruments that receive legacy treatment will likely be influenced primarily by organizations seeking to optimize rates of matching where and when it will be more economical or feasible in the short run. These markets may not be equitably distributed around the world, however it does not seem to be the role of a legacy clause provision to attempt to shape distribution of contractual instruments qualifying for a legacy clause.

📌*Note: EnergyTag defers answers to Questions 179-180 to those with particular expertise in climate-related financial risk disclosure programs.*

Q181. *Some stakeholders have outlined a preference for transition tools other than a legacy clause as a way to balance continuity and comparability for the scope 2 MBM.*

Which transition approach best balances continuity and comparability for the Scope 2 MBM whilst maintaining integrity, impact, and feasibility?

- ☐ *Legacy clause: allow existing contracts that meet current quality criteria to continue to be reported under the MBM as described in Question 178.*
- ☐ *Uniform effective date: rather than using a legacy clause, instead apply the updated quality criteria to all contractual instruments from a specific date following a defined lead time. The lead time would seek to facilitate companies having time to consider changes to existing contracts. Contracts executed before the effective date could continue to be used during the lead time, with separate, clearly labelled disclosure identifying results affected by those contracts.*
- ☐ *Other (please specify)*

📌*Note:* *EnergyTag does not take a stance on which approach is better here. More important are the guiding principles described under the EnergyTag note in Question 178.*

A uniform effective date may be more stringent in some ways because it more definitively closes the loophole around which types of contractual instruments are allowed to maintain weaker quality criteria throughout the life of a contract. This could help ensure weak, unbundled EAC procurements are not receiving legacy treatment for too long. On the other hand, the uniform effective date would essentially push back the date under which new contractual instruments would need to follow updated quality criteria. This could create a rush on short-term procurement of contractual instruments designed only to take advantage of weaker accounting rules before the effective date comes into effect.

📌*Note:* *Question 182 provides extra space for those who selected "Other" in Question 181 to explain alternative transition approaches.*

Q183. *If a uniform effective date was applied rather than a legacy clause, what would be an appropriate date for organizations to be required to apply the updated quality criteria to all contractual instruments?*

🎯**Recommended Answer:**

- If a uniform effective date is applied, the timeline must be quite short, because otherwise it represents simply an extension of today's rules. Depending on how long the phase-in for the rules will be, a uniform effective date should not act as an additional significant extension.

- A timeline of 3-5 years for the effective date to be in place represents plenty of time for organizations to prepare for the new quality criteria, markets to take steps to support new quality criteria, and suppliers to offer more varied solutions for buyers.

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3. Next Steps & Call to Action

Make sure to submit your public consultation response before the deadline and do not hesitate to reach out with any questions in the meantime. After that, there are a number of other ways to stay involved in ongoing conversations related to this issue:

3.1 Stay Involved!

If you would like to continue to stay involved and join the coalition supportive of the proposed changes to the GHGP, please **sign up**.

Check out **ScopeTrue.org** for a one stop shop on all resources shared in this document.

3.2 Coalitions and Partnerships

Check out these other coalitions and partnerships working to drive granular accounting and matching forward:

- Climate Group 24/7 Carbon-Free Coalition
- 24/7 Carbon-Free Energy Compact
- Granular Certificate Trading Alliance

3.3 Contact and Support

For further questions and follow up conversations, please contact Alex Piper at EnergyTag: alex@energytag.org

Deep Dive "Annex" Chapters

4. Understanding the GHGP Revision Process to Date

4.1 What is the GHG Protocol and Scope 2?

The GHGP is the global standard-setter for greenhouse gas accounting, co-hosted by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). It provides the methodologies that underpin both voluntary and regulatory disclosure systems. Scope 2 represents the emissions from purchased and consumed electricity[4]. Scope 2 is inventory accounting, which is related to operational emissions within a company's value chain. This is distinct from project / consequential accounting, which estimates avoided emissions outside the company's value chain.

> The GHGP defines the difference between inventory and consequential accounting in this way:
>
> *Inventory accounting* "tracks GHG emissions and removals within a defined organizational and operational boundary over time. It is the primary method used by corporations and other organizations to report emissions from their operations and value chains."
>
> *Consequential accounting* "estimates the impacts or changes in GHG emissions resulting from specific projects, actions, or interventions relative to a counterfactual baseline scenario. It is the primary method used to evaluate the emission effects of projects by comparing emissions and removals that happen in the project scenario with an estimate of what would have happened without the intervention."
>
> Put more simply: inventory accounting is an observable measurement and allocation of the emissions a company is responsible for within their boundary of operations, while consequential accounting is an estimate of the increase or decrease in emissions of a given action compared to a world in which the action did not occur (an unobservable counterfactual).

4.2 Why is Scope 2 Being Revised?

The current Scope 2 Guidance, introduced in 2015, helped scale clean energy procurement but has serious shortcomings. As the GHGP notes in their recent blog post, today's Scope 2 "market-based" standard, which assigns emissions to electricity consumers based on contracts with specific sources of generation, has

[4] And steam, heat, and cooling.

helped scale clean energy procurement in a period of early market development. At the same time, the Scope 2 Guidance has been rightly criticized for lacking accuracy and transparency, undermining the credibility of corporate clean energy and emissions reductions claims.

It allows companies to report renewable electricity consumption that does not match the time or place of their actual use. A company consuming coal-based power at night can still claim "100% renewable" by buying daytime solar certificates from a distant grid. This undermines accuracy, comparability, and credibility, and risks Scope 2 becoming irrelevant in the eyes of regulators and investors.

Consider that today:

- A company consuming power in West Virginia or Poland can claim to use clean energy generated in California or Ireland, respectively **(No reasonable expectation of deliverability from where clean power is generated to where is consumed)**.
- A company consuming fossil-generated electricity at night in December can claim to have used solar power generated at midday in June **(No clean supply when power is consumed)**.
- A company can claim to be 100% powered by clean energy even if their supplier just shuffles existing clean energy resources away from other consumers to meet the company's voluntary claim **(No additional voluntary procurement beyond standard delivery carbon-free electricity (CFE))**.
- A company can claim grid-mix clean energy to which they have no contractual relationship and which may already be claimed by other consumers, by using grid average emissions factors in their market-based calculation **(Double counting of clean energy)**.

Today's standard does not ensure that reported market-based emissions are credible, accurate, or comparable across reporters or geographies. Moreover, companies are structurally incentivized to purchase the cheapest Energy Attribute Certificates (EACs) [5] that allow them to make the same emissions reductions claims, regardless of whether the purchases align with their actual electricity consumption or enable system-wide emissions reductions. This leads to obvious distortions such as Norway exporting five times the amount of EACs as it does electricity.

Insofar as the standard shapes voluntary procurement behavior, it is no longer driving the action that is needed to meet current grid decarbonization challenges. While today's standard has helped accelerate the addition of significant amounts of clean energy capacity to the grid, the next phase of grid

[5] EACs - the basic contractual instruments underpinning market-based reporting.

decarbonization requires not only adding *capacity* but also reliably *integrating* higher shares of clean energy. As the International Energy Agency writes in their recent report on integrating wind and solar power,

> *Corporations seeking to match their demand with clean generation may be tempted to purchase power from the cheapest resources (often solar PV generation) regardless of the temporal alignment with their demand and the availability of grids. Compared to yearly matching, shorter matching periods can deliver a more diverse clean energy portfolio, bringing wind, batteries and clean dispatchable capacities online in addition to cheaper solar PV.*

Unfortunately, the existing Scope 2 standard does little to incentivize this range of technologies needed to fully decarbonize electricity systems.

4.3 How is The Process Governed?

The revision process is overseen by three governance bodies.

1. The **Steering Committee (SC)** provides strategic oversight and ratifies ISB decisions. Day-to-day management is handled by the GHG Protocol Secretariat, hosted by WRI and WBCSD.
2. The **Independent Standards Board (ISB)** decides the technical content of standards, guided by principles that prioritize integrity first, then impact, and finally feasibility. (see Chapter 4.5 for more details)
3. The **Technical Working Groups (TWGs)** bring together diverse stakeholders to draft proposals and weigh evidence.

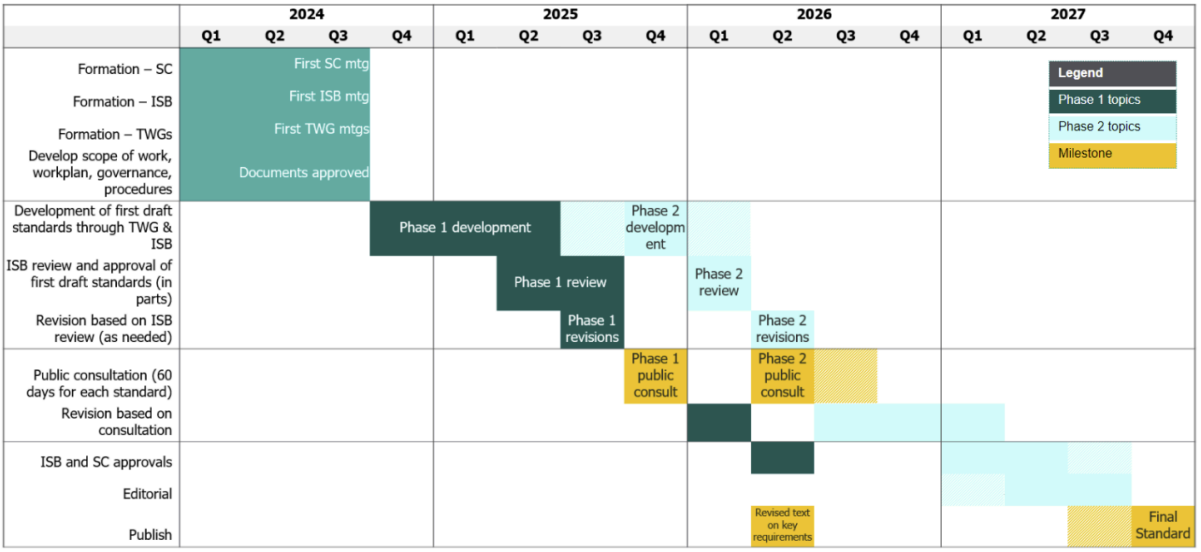
The TWG has proposed an update to the market-based accounting standard. The ISB voted to move this proposal forward to public consultation for further feedback.

4.4 What is The Process Timeline?

Phases	Topics to be addressed
Phase 1	1. Clarify objectives and consider any changes to the required reporting methods 2. Location-based method technical improvements 3. Market-based method technical improvements 4. Role of project-based accounting methodology relative to scope 2 accounting 5. Guidance for regional variation in energy markets 6. Interaction with policies and programs
Phase 2	1. TWG consultation on any additional topics as necessary from Phase 1 2. Interactions across Scope 2 and Scope 3 3. Guidance for purchased steam, heat, and cooling 4. Utility-specific guidance and clarification on T&D losses 5. Technical methodology guidelines for data providers 6. Technology-specific guidance

Source: GHG Protocol - Scope 2 Standard Development Plan.

The Scope 2 update is being tackled in two phases. Phase 1 addresses the core structure and integrity of Scope 2 reporting. Phase 2 will follow up on any unresolved Phase 1 issues and expand into broader technical areas.



Source: GHG Protocol Scope 2 - Standard Development Plan.

The Scope 2 revision process is unfolding over five years, beginning in 2023 with a survey process and then with the formation of governance bodies and the development of draft content by Technical Working Groups in 2024. Phase 1 revisions are underway in 2025, with the first public consultation happening now in Q4 2025. Phase 2 development will run through 2026, including another review and consultation period. Final approvals and publication are scheduled for 2027, with a transition period of a number of years expected.

4.5 Key Proposed Changes: At a Glance

The GHGP update process was guided by a specific decision-making criteria and hierarchy.

Proposed changes to the GHGP were evaluated based on which changes best adhered to the criteria. The hierarchy was put in place so that when options presented tradeoffs between criteria, a criteria higher up the hierarchy would not be compromised for a criteria farther down the hierarchy. Of course, the GHGP aims to find solutions that can meet all criteria.

Integrity	Impact	Feasibility
Ensure scientific integrity and validity, adhering to the best applicable science and evidence	Inform and support decision making that drives ambitious climate action by private and public sectors	Be accessible, adoptable, and equitable. Where difficult to implement, GHGP should offer guidance and tools

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The proposed update can be summarized as follows: a company's market-based Scope 2 emissions should be calculated based on purchased clean energy that aligns with **where** and **when** a company consumes electricity, without relying on clean energy rightfully claimed by others. This ensures that claims to use clean energy are credible. There are four key updates that enable this:

- **Local Sourcing.** The proposal narrows the geographic boundaries for Scope 2 market-based claims to ensure that the purchased clean energy that companies claim to use could reasonably be expected to reach the point of use. This means better aligning market-based inventory boundaries with existing electricity market boundaries (e.g. European bidding zones).
- **Hourly Accounting.** The proposal requires companies to use hourly accounting for their market-based Scope 2 inventories. To make a market-based claim, a company would need to match their consumption to generation occurring in the same hour. This change would better align corporate clean energy claims to the reality of electricity markets and systems, which operate at hourly (or sub-hourly) intervals.
- **Standard Supply.** The proposal clarifies how to account for electricity from publicly funded, mandated, or shared resources such as those delivered through default utility service or government clean energy programs. It

limits a company's claims to a fair and proportionate allocation of CFE resources that a company is required to support and disincentivizes shuffling of these shared CFE generation resources (e.g., public or regulated hydro or nuclear) to support exclusive voluntary claims. Companies will be encouraged to drive new clean electricity onto the grid to be 100% emissions free.

- **Residual Mix.** The proposal no longer allows the use of grid-average emissions factors for market-based accounting (which can lead to double counting of clean electricity). Instead, in the absence of supplier-specific emissions factors, companies would use residual mix factors. If those are unavailable, fossil-only emissions rates are required to avoid clean energy being double-counted or claimed by a company that has no contractual link to it.

Metric	Today's Rule	Proposed Update	Criteria Rationale
Temporal	Annual Matching	Hourly	***Integrity:*** No more solar claims at night ***Impact:*** Science shows this maximises impact by incentivizing storage, clean firm, and renewable portfolios that deliver clean electricity *when* it is needed ***Feasibility:*** Hourly data common in power markets, exemptions for small loads, supply/load profiles permitted, transition period will help scale solutions
Spatial	Non-Deliverable	Deliverable	***Integrity:*** Non-deliverable power (e.g Texas wind in New York) should not be claimed ***Impact:*** Science shows this drives clean power *where* it's needed ***Feasibility:*** No additional data need on EACs as location already known
What Counts	Resource Shuffling	Standard Supply Service (SSS)	***Integrity:*** Consumers claim a fair share of what they paid for, and don't claim what's paid for by others ***Impact:*** Fairly distributes existing clean electricity, encourages new clean supply ***Feasibility:*** Will require mapping of generators in SSS
Unmatched Emissions	Grid Average Default Emissions	Residual/ Fossil Mix	***Integrity:*** Reduces double counting of default grid mix which contains clean energy claimed by others

			Impact: Stronger incentive to buy more clean energy attributes ***Feasibility:*** While residual mix is hard to obtain today, default fossil mix is easily obtained in the meantime

This proposed update significantly improves the accuracy and comparability of Scope 2 market-based inventory claims and addresses key criticisms of the current standard that threaten the integrity of market-based accounting and the future credibility of voluntary clean energy markets. It also ensures the GHG Protocol remains relevant in the coming decades and incentivizes the development of clean energy when and where it is needed, presenting significant opportunities for a broad range of clean energy developers globally.

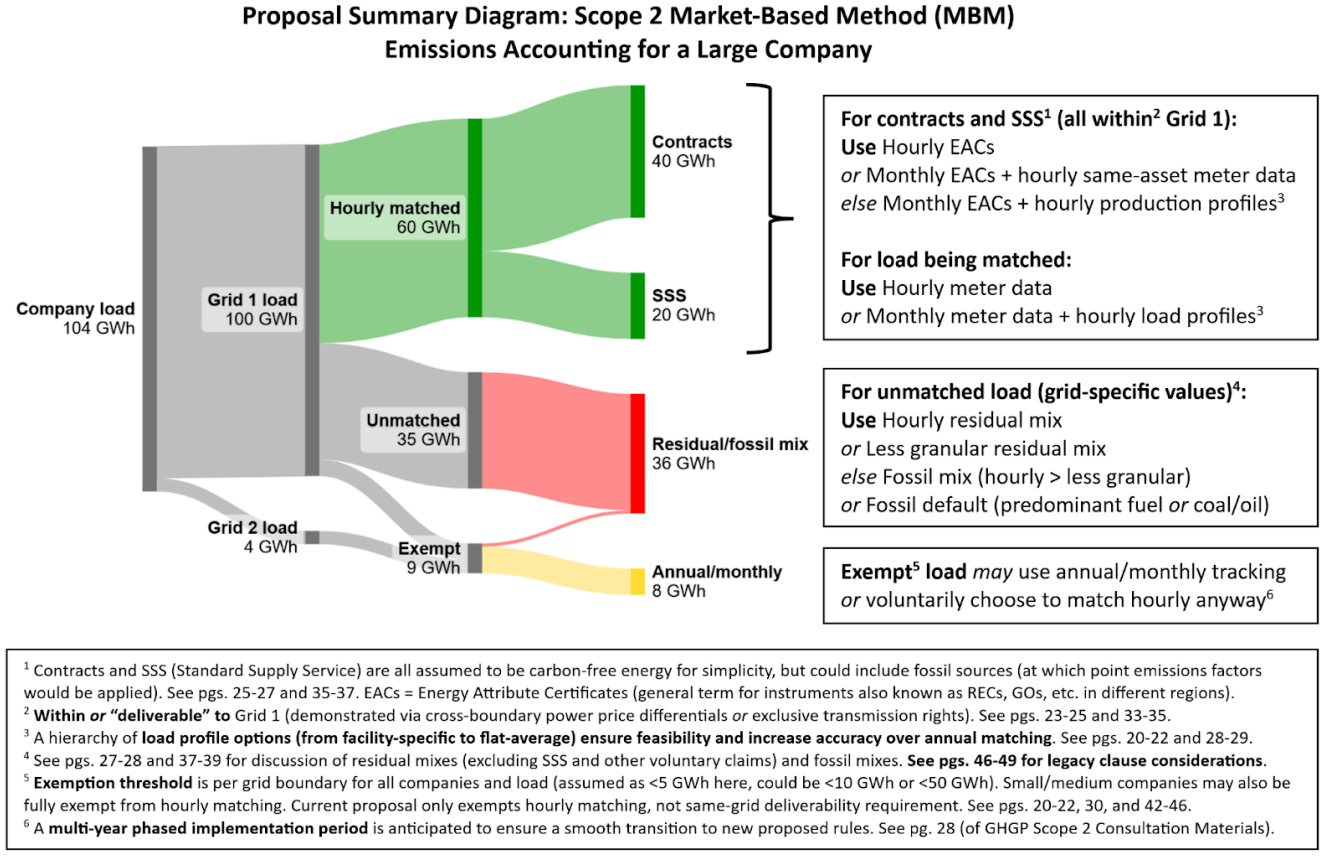
4.6 Commonsense Flexibilities and Transition

While these updates are necessary for high-integrity Scope 2 accounting, they do represent changes from the status quo - as is the norm with any standard update. To ensure this transition is smooth and feasible, without sacrificing the impact of these important reforms, the proposal is considering a number of flexibilities:

- **Exempting smaller companies from hourly accounting.** Companies with electricity use below 5, 10 or 50 GWh annually per market boundary (level is up for public comment) would be exempt from hourly matching and may match on a monthly or annual basis.
    - A subset of only 7% of companies reporting to CDP in 2024 account for more than 76% of the electricity purchasing represented by the entire group, showing the outsized role of large companies.
    - A 10 GWh threshold would mean only the largest 13-35% of companies must report hourly, while covering >95% of load in the countries analyzed (see pg 21 here).
- **Standard profiles and bridging mechanisms enabling hourly accounting.** Where hourly meter data are unavailable, companies may use hourly load profiles to estimate the hourly profile of their monthly-metered load. Where hourly EACs are not yet available, hourly generation data may be combined with monthly EACs to enable hourly claims.
    - EnergyTag's Configuration 3 standard already outlines transparent rules for how to effectively enable hourly claims by combining today's EACs and generation data, which is already available in over 40 countries.
    - High quality profiles already exist in many cases and pulling together an accessible database for all use cases should be quite doable

- **Lead time to adapt to new rules.** The new guidance is expected to be finalized at the end of 2027, and implementation will follow a transition period, giving companies and markets time to adjust, and technology providers time to develop data and solutions to support the implementation of the new rules.
- **Respecting existing clean energy contracts.** Long-term contracts signed under today's rules would continue to count in appropriate ways, ensuring companies are not penalized for long-term commitments made under today's standard (while also ensuring the legacy clause is sufficiently robust to not induce significant leakage of integrity and therefore emissions, such as via dirt-cheap unbundled RECs).

4.7 Process for Obtaining a Scope 2 Number Under Updated Rules



The graphic above summarises how scope 2 accounting should be done under the new proposal (this link is what the diagram's footnotes refer to). Each unit of consumed electricity with a deliverable market boundary is either:

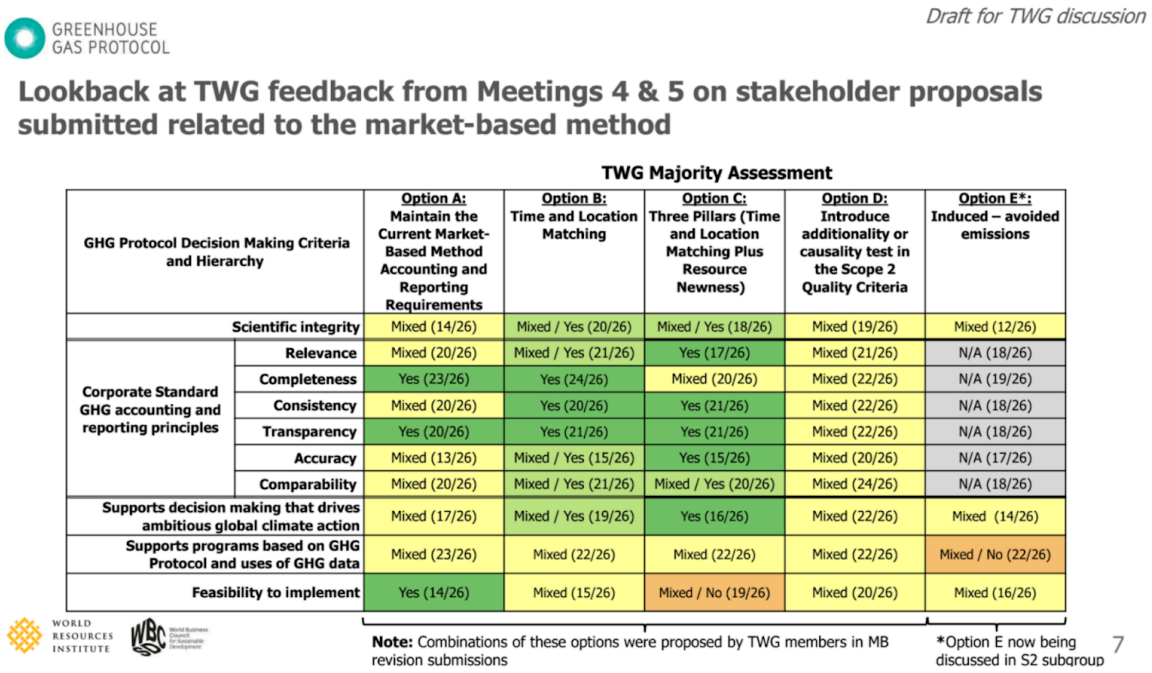
- **Matched:** Consumed electricity volume (MWh) is hourly matched to a contractual instrument with a specific emissions factor following the

hierarchy above. For consumption below [5, 10, or 50 GWh/yr - up for public comment] hourly matching is not required.

- **Unmatched:** Where consumed electricity volume (MWh) is not matched to any specific contractual instrument (like an EAC), the emissions factor used follows the hierarchy above. Crucially, while hourly emissions factors are preferred for unmatched consumption, it is not a requirement. In the simplest case, a consumer can take their annual consumption and multiply it by the annual residual or fossil mix, a calculation no more difficult than the current protocol.

This proposal ensures it remains highly feasible to calculate a Scope 2 market-based number. However, for companies striving to demonstrate leadership and match low-emissions electricity procurement with consumption, higher integrity reporting will be required based on the best available hourly data.

4.8 How Did the TWG Arrive at the Current Proposal?



Draft for TWG discussion

GREENHOUSE GAS PROTOCOL

Lookback at TWG feedback from Meetings 4 & 5 on stakeholder proposals submitted related to the market-based method

TWG Majority Assessment

GHG Protocol Decision Making Criteria and Hierarchy		Option A: Maintain the Current Market-Based Method Accounting and Reporting Requirements	Option B: Time and Location Matching	Option C: Three Pillars (Time and Location Matching Plus Resource Newness)	Option D: Introduce additionality or causality test in the Scope 2 Quality Criteria	Option E*: Induced – avoided emissions
Scientific integrity		Mixed (14/26)	Mixed / Yes (20/26)	Mixed / Yes (18/26)	Mixed (19/26)	Mixed (12/26)
Corporate Standard GHG accounting and reporting principles	Relevance	Mixed (20/26)	Mixed / Yes (21/26)	Yes (17/26)	Mixed (21/26)	N/A (18/26)
	Completeness	Yes (23/26)	Yes (24/26)	Mixed (20/26)	Mixed (22/26)	N/A (19/26)
	Consistency	Mixed (20/26)	Yes (20/26)	Yes (21/26)	Mixed (22/26)	N/A (18/26)
	Transparency	Yes (20/26)	Yes (21/26)	Yes (21/26)	Mixed (22/26)	N/A (18/26)
	Accuracy	Mixed (13/26)	Mixed / Yes (15/26)	Yes (15/26)	Mixed (20/26)	N/A (17/26)
	Comparability	Mixed (20/26)	Mixed / Yes (21/26)	Mixed / Yes (20/26)	Mixed (24/26)	N/A (18/26)
Supports decision making that drives ambitious global climate action		Mixed (17/26)	Mixed / Yes (19/26)	Yes (16/26)	Mixed (22/26)	Mixed (14/26)
Supports programs based on GHG Protocol and uses of GHG data		Mixed (23/26)	Mixed (22/26)	Mixed (22/26)	Mixed (22/26)	Mixed / No (22/26)
Feasibility to implement		Yes (14/26)	Mixed (15/26)	Mixed / No (19/26)	Mixed (20/26)	Mixed (16/26)

WORLD RESOURCES INSTITUTE

Note: Combinations of these options were proposed by TWG members in MB revision submissions

*Option E now being discussed in S2 subgroup

7

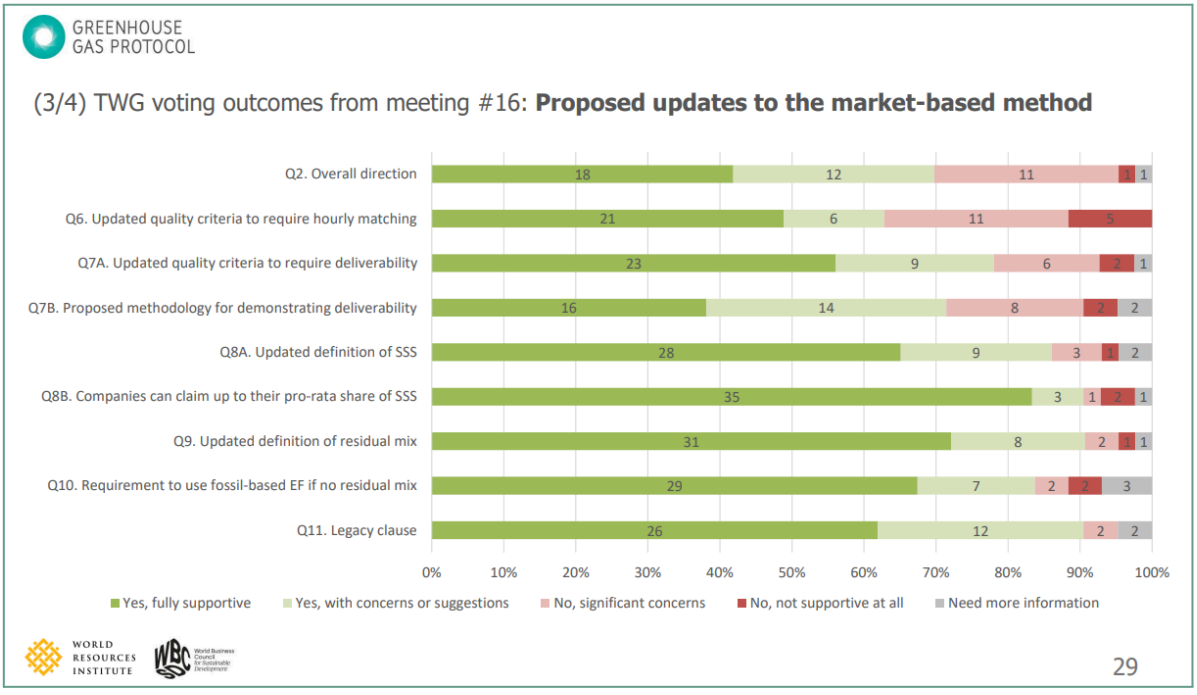
Source: GHGP Scope 2 TWG #8.

The table above summarizes polling of 26 TWG members on five different options for the market-based method, as identified in the initial public survey from 2023, based on an evaluation by the secretariat of their alignment with the decision-making criteria. Options B and C — both centered around **temporal and location matching** — stand out as the preferred choices. They score highest across nearly every decision-making criterion. Option B requires time and location matching, while Option C adds further rigour by tying claims to new clean energy

resources. Meanwhile, Options A (status quo) and E (focused on consequential accounting using induced/avoided emissions) received notably less support. The GHGP has also clarified that the consequential accounting methodology will now go through further development in a separate and parallel process under a different technical working group.

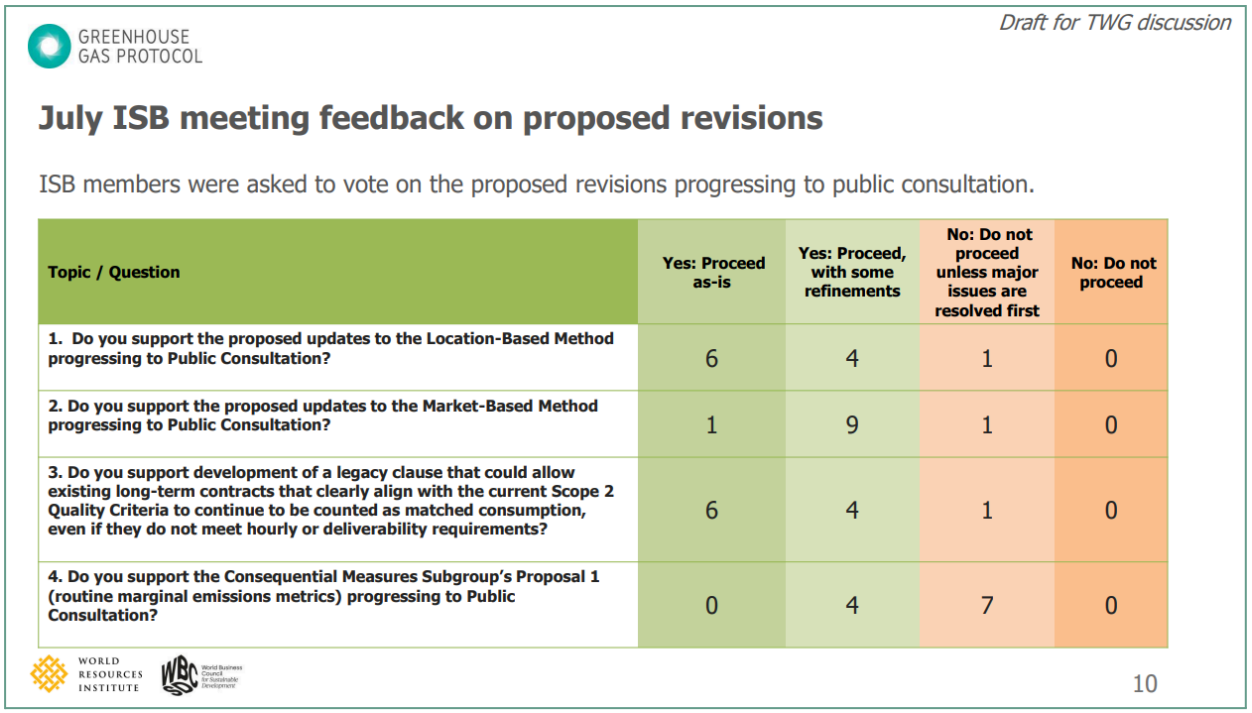
4.9 To What Extent is The Proposal Supported by TWG / ISB?

The TWG largely supports the overall direction of the proposed updates. Notably, many of the specific updates, including hourly matching, deliverability, and standard supply service received significant support from the TWG.



Source: GHGP Scope 2 TWG #17.

The ISB voted 10 to 1 to move the proposed updates for the market-based methodology to public consultation.



Draft for TWG discussion

GREENHOUSE GAS PROTOCOL

July ISB meeting feedback on proposed revisions

ISB members were asked to vote on the proposed revisions progressing to public consultation.

Topic / Question	Yes: Proceed as-is	Yes: Proceed, with some refinements	No: Do not proceed unless major issues are resolved first	No: Do not proceed
1. Do you support the proposed updates to the Location-Based Method progressing to Public Consultation?	6	4	1	0
2. Do you support the proposed updates to the Market-Based Method progressing to Public Consultation?	1	9	1	0
3. Do you support development of a legacy clause that could allow existing long-term contracts that clearly align with the current Scope 2 Quality Criteria to continue to be counted as matched consumption, even if they do not meet hourly or deliverability requirements?	6	4	1	0
4. Do you support the Consequential Measures Subgroup's Proposal 1 (routine marginal emissions metrics) progressing to Public Consultation?	0	4	7	0

WORLD RESOURCES INSTITUTE

10

Source: GHGP Scope 2 TWG #17.

5. Evidence for Proposed Changes

5.1 Integrity: Why Hourly & Local Matching Improves Accuracy

Electricity must be produced and consumed at the same time within the same grid, unless storage is involved - this is a fundamental reality of power grids and it's why electricity markets price power (sub)hourly and locally across the world. Today's scope 2 rules, based on annual matching and largely ignoring deliverability are completely misaligned with these fundamental realities. Hourly, local matching ensures reported consumption reflects this reality, while deliverability boundaries prevent claims based on power that could never plausibly serve the load. This closes the most significant loopholes in today's system.

5.2 Impact: Driving System Decarbonization

Researchers: Modelling done by TU Berlin, Princeton, and IEA, across the EU, US and APAC has shown the emissions and technology incentive benefits of this approach. Research also suggests that this approach is best suited to accelerate the deployment of advanced clean technologies needed for a deeply decarbonized grid.

See Chapter 7 for a list and links to research showing that greater granularity in clean electricity procurement/matching drives deeper decarbonization than annual-volumetric or consequential-based approaches.

5.3 Feasibility: Data, Tools, and Market Readiness

System Operators: ENTSO-E, which brings together 40 of Europe's electricity system operators has clearly stated that hourly matching and deliverability are better for the power system. A recent study from the UK's system operator NESO also concluded that the move to hourly matching would be positive for the system, particularly in incentivising clean flexibility, storage and demand response. In the U.S., CAISO and SPP are actively exploring systems for granular emissions tracking in their markets. PJM already offers hourly electricity tracking through their Generation Attribute Tracking System (GATS).

Suppliers: Globally, many electricity suppliers offer hourly matching e.g. AES, Constellation, Engie, Entergy Arkansas, Georgia Power, Good Energy, Greenko, Jera, Octopus Energy, Sembcorp, Sol Systems, TotalEnergies, Vattenfall and more.

Buyers: Electricity buyers around the world are also committing to procure more hourly matched and locally sourced electricity. Many of these buyers have committed to moving towards 24/7 CFE targets and are demonstrating the feasibility of procuring and accounting for their electricity emissions on an hourly basis. They include: Google, Microsoft, Air Trunk, Princeton Digital Group, Shree Cement, Astra Zeneca, and Iron Mountain.

5.4 Broad Support: Researchers, Governments, System Operators, Suppliers

The idea of requiring hourly and spatially-matched energy use claims that better reflect grid realities was proposed and supported by a number of respondents to the Greenhouse Gas Protocol's 2023 survey, as described by the GHGP's Scope 2 Proposal Summary. A significant majority of the Scope 2 Technical Working Group (72%) supports the proposed updates to the Scope 2 market-based standard. These changes also have support from the Independent Standards Board (ISB), which ultimately approves of any changes to the GHGP. Outside of the official revision process, these proposed changes are consistent with granular accounting principles supported by a broad range of key energy stakeholders:

- **Governments:** The European Union, UK, and US governments have adopted regulations requiring granular accounting for electrolytic hydrogen and other products. Several U.S. states, such as California and

Minnesota, have adopted or are considering granular accounting rules in policy frameworks.

- **Civil Society:** NGOs including Natural Resource Defense Council, Transport and Environment, Clean Air Task Force and Environmental Defense Fund have supported these principles in relation to hydrogen regulations in the US and Europe.
- **Corporate Coalitions:** Multi-stakeholder coalitions also support hourly-matched and local procurement. For example, the 24/7 Carbon-free Energy Compact includes over 170 signatories, and a Clean Air Task Force joint letter from 2023 shows broad support for more granular Scope 2 accounting (with consequential metrics separate). The Climate Group's 24/7 Carbon-free Coalition includes a number of corporate clean energy buyers. Microsoft, Google, and Iron Mountain have hourly matching goals, while many others have announced hourly matched procurement deals.

5.5 Select Quotes and Views from Expert Sources

- Jesse Jenkins:

  "*Voluntary carbon-free electricity procurements made under volumetric [annual] or emissions matching [impact accounting] strategies have zero or near-zero long-run impact on system-level CO2 emissions. [...] By contrast, temporal matching drives significant reductions in system-level CO2 emissions by requiring generation of carbon-free electricity even in hours when fossil-based resources would normally be preferred. Temporal matching also incentivizes procurement of advanced clean firm generation and long-duration storage technologies that would not otherwise see market uptake.*" *System-level Impacts of Voluntary Carbon-free Electricity Procurement Strategies*.

- Jesse Jenkins:

  "*But that kind of annual contract "simply shifts around on paper what would have been claimed by someone else and does not truly lead to additional clean energy capacity added to the grid.*"
  The new hydrogen tax credits could revolutionize how clean energy is counted.

- Michael Liebreich:

  "*Reform the Greenhouse Gas Protocol carbon-accounting rules. The current ones, written in 1990, allow companies to claim they use 100% renewable power on the basis of annual matching – which means they can offset night-time coal use with extra purchases of daytime solar power. It's absurd and destroys public confidence. The*

rules are currently under review and need to be tightened." *Liebreich: The Pragmatic Climate Reset – Part II: A Provocation*.

- United Kingdom National Energy System Operator:

  "*Moving to 24/7 CFE EACs (time matched carbon free energy attribute certificates) could support the goal of a net zero power system by 2030 by directing voluntary funds into creating a more flexible clean power system.*"
  Implications of Trading of 24/7 Carbon Free Energy (CFE) on Electricity System Operation.

- Seaver Wang, The Breakthrough Institute:

  "*At the end of the day, the greatest value to society from companies pledging various climate targets isn't their narrow emissions goals but rather the larger innovation and commercialization for clean energy technologies that they stimulate. Regional and hourly clean electricity accounting will help better direct such sustainability*-minded investment precisely towards a cleaner grid's greatest needs."
  It's Time to Raise the Bar for Corporate Clean Energy Buying.

- International Energy Agency:

  "*Corporations seeking to match their demand with clean generation may be tempted to purchase power from the cheapest resources (often solar PV generation) regardless of the temporal alignment with their demand and the availability of grids. Compared to yearly matching, shorter matching periods can deliver a more diverse clean energy portfolio, bringing wind, batteries and clean dispatchable capacities online in addition to cheaper solar PV.*"
  Integrating Wind and Solar.

6. Frequently Asked Questions

6.1 Questions About Impacts of the Proposal

- Is this forcing buyers to do 100% hourly matching, i.e. 24/7 carbon-free energy (CFE)?

No. The proposed updates to the GHGP Scope 2 market-based are about improving the accuracy of inventory emissions by more closely aligning them with the physical and market realities of electricity systems. GHGP is not a target-setting body, and does not require companies to set any particular targets for their procurement. For companies that set targets based on their market-based inventory, they may set goals that are less than 100% hourly matched (which studies have found can be just as cost-effective as 100% annual goals). Companies can continue to pursue procurement strategies that best suit their organizations (e.g., annual matching, hourly matching, emissions matching), but they would report their market-based inventory emissions based on the updated standard. This increases the credibility and comparability of inventory emissions claims.

- Won't forcing small businesses to do hourly accounting reduce participation?

The proposed update ensures that most small businesses would not be required to do hourly accounting. It would allow companies with consumption below a threshold (e.g., 5-10 GWh in a given region) to continue to do annual accounting. Data from CDP shows that a small number of companies consume the vast majority of electricity. A recent CDP company disclosure report states that "A subset of only 7% of these companies accounts for more than 76% of the electricity purchasing". Based on an analysis of CDP data, about 38% of companies reporting to CDP consume less than 10 GWh per year globally. Therefore, a regional exemption up to a load threshold (e.g., 5-10 GWh) would allow many small businesses to continue to do annual or monthly accounting. Moreover, it is to be expected that in the transition period towards the standard's implementation, both software tools for granular accounting and hourly-matched CFE products of electricity suppliers will become increasingly available, further facilitating hourly accounting for businesses of all sizes.

- Won't these requirements stop voluntary procurement due to their cost?

No. The most credible studies of the costs and impacts of hourly matching (e.g., Princeton, TU Berlin, IEA) show that buyers can procure 80-95% hourly matched clean energy at costs that are comparable to annual matching today, while 100% hourly matching comes at a premium. A recent study focused on India found that 70% hourly matching can be achieved *more cheaply* than 100% annual matching, while having a greater decarbonization impact and significant cost savings (up to 1 billion USD) for the electricity system. In other words, companies do not need to achieve 100% hourly matching to have a significant impact. Moreover, as mentioned above, the proposed revisions do not force companies to set any particular procurement targets or voluntary procurement strategies, but rather to account for their emissions more accurately.

- Will this make it harder for companies to report zero market-based emissions?

Yes, but getting to fully zero emissions *is* hard. Today's standard allows companies to claim to have zero emissions on paper, while still relying on fossil power on their local grid to serve their consumption. A more accurate accounting system must stop assuming that solar generation is consumed at night, that electricity generated on faraway, disconnected grids is consumed where a company operates, or that a portfolio of clean energy resources is not needed to fully match supply and demand reliably and affordably. Updated Scope 2 market-based accounting is intended to provide a more accurate measure of progress towards the decarbonization of electricity use. The proposed update makes carbon accounting more accurate and transparent, while highlighting where more investments are needed, providing opportunities for clean energy, and flexibility that are often neglected today.

- Won't these requirements slow the pace of voluntary procurement?

It's likely that the opposite is true. Many companies already claim 100% clean energy consumption based on the existing standard, and according to RE100, over 60% of their members have 100% (annually-matched) renewable electricity targets on or before 2030. Once these companies reach their current goals and claim "mission accomplished" (i.e., the use of 100% clean energy and zero Scope 2 market-based emissions), they will have little incentive to do more, even as they continue to physically rely on carbon-intensive electricity. A more accurate Scope 2 standard that requires deliverable, hourly-matched clean energy procurement for market-based claims would incentivize continued investment past 2030 from these leading companies. If the existing standard remained in place, it is possible that we could see a slowdown in voluntary clean energy investment after 2030 once all of these current goals are met.

- Won't tighter market boundaries limit investments?

No. Tighter market boundaries will direct clean energy investments where it's most needed to supply consumption, and other metrics can be used to estimate impacts separate from the market-based inventory associated with company actions taken outside or within their market boundary. Today, the US and Europe have broad market boundaries, which have led to heavy concentration of procurement in certain regions where renewables are cheapest and easiest to permit, not where they are needed to serve a company's demand. Based on BNEF PPA data, Texas makes up about 40% of total PPA capacity signed in the US since 2000, while having a significantly lower share of commercial and industrial load and being poorly interconnected to the rest of the US. Deliverable market boundaries encourage companies to invest in clean energy where they consume power for their operations.

The proposed market boundaries define where clean energy claims are considered deliverable, in order to better reflect real flows of electricity on grids and ensure reasonable alignment between electricity consumption and generation. These revisions aim to harmonize accounting with actual grid flows and clarify the distinction between inventory data and broader emissions impact assessments. A TWG subgroup is developing a complementary framework for estimating the emissions impact of procurement actions, enabling companies to make non-inventory claims related to avoided emissions, including supporting clean energy in developing regions or taking climate actions outside their market boundary when their local supply options are limited.

- Will changing the rules lead to fewer long-term contracts?

No, the new proposed rules could encourage more long-term contracts. Companies sign long-term PPAs to benefit from stable and competitive electricity prices as well as to meet clean energy sustainability goals. Aligning PPA production and consumption on an hourly and local basis improves the value of PPAs to corporate consumers as it generates power they can actually use in their operations. This also provides a greater price hedging benefit compared to PPAs in grids where a consumer has no consumption, which provides little hedge value and leaves consumers fully exposed to volatile market price risks for power they don't need for their operations. In any case, today's Scope 2 rules do not favor long-term contracts. Among RE100 companies, PPAs comprise only 27% of renewable energy procurement, with unbundled EACs comprising the greatest share. In addition, the Scope 2 proposal includes a new incentive for companies to sign long-term contracts to estimate the marginal emissions impact of their procurement actions.

- Does this require each company to act like an island?

No. Some have argued that requiring companies to procure the full set of resources necessary to match their own demand — as if they were the only consumer on the grid — is inefficient. But the proposed standard does not require this. Companies can continue to procure much of the power they need via long-term contracts, but they can also purchase certificates when their own portfolio is short or sell certificates when they have excess. Granular certificate trading platforms are already being set up, and studies have shown that pooling and trading procured clean generation certificates in this way reduces the cost of hourly CFE matching for companies. Like today, electricity suppliers can create supply portfolios and aggregate customer demands to more efficiently supply the demand and production profiles of many customers and generators. The proposed accounting standard is intended to encourage suppliers to develop clean products and companies to procure deliverable clean power in each hour while also considering reliability and affordability of electricity supply.

6.2 Questions about Feasibility of the Proposal

- Isn't hourly accounting very difficult?

No. Hourly accounting simply means collecting (or estimating) hourly electricity consumption data, collecting hourly data from purchased clean energy, and comparing them. This process of balancing supply and load on a (sub)hourly basis is fundamental to the operation of power markets around the world. This accounting can be done today in spreadsheets, as illustrated by the template spreadsheet here that companies can use. Moreover, many service providers exist that help automate this process for companies. Examples include: Atmen, Blok-Z, Flexidao, Granular Energy, LevelTen Energy, Powerledger, Renewabl, and others. Finally, any company with a PPA in a deliverable grid will easily be able to account for it hourly, by using the hourly rather than annual aggregate generation data.

- How many companies are engaged in hourly matching today?

Many. Here is a non-exhaustive list of hourly matching across the globe: A2A, Acciona, AES, AM Green, Brook Green Energy, Brookfield Properties, Catalyst Power, Chiang Mai University, Constellation, Drax, Digital Realty, D-Sharing, Ecotricity, EdgeConnex, Einstein Bros. Bagels, ekWateur, Engie, Entergy Arkansas, Georgia Power, Good Energy, Google, Greenko, Ingka Group, Iron Mountain, Jera, JP Morgan Chase, Mercedes Benz, Microsoft, npower Business Solutions, Octopus

Energy, Peninsula Clean Energy, PPC, Quinbrook Infrastructure Partners, Rio Tinto, Sembcorp, Shandong Luneng Group, Smartest Energy, Sol Systems, SSE, Statkraft, Svea Solar, TotalEnergies, UBS, Vattenfall.

- Is hourly matching realistic for buyers of different sizes?

Many organizations of all sizes are already doing clean energy hourly matching across five continents with millions of MWh. Large companies like Google, Microsoft, and Iron Mountain already have hourly matching goals, but smaller companies are doing this too. For example, GoodEnergy, a UK Energy supplier, is enabling hourly matching for its business customers, and Einstein Bagels is also doing hourly matching in the US. In addition, utilities and power suppliers, by necessity, have been doing hourly matching of deliverable energy for decades, and can play an increasingly important role by making hourly-matched products and green tariffs available for their customers of all sizes. A non-exhaustive list of utilities and energy suppliers offering hourly matching products around the world includes: A2A, Acciona, AES, Catalyst Power, Constellation, Duke Energy, Engie, Entergy Arkansas, Georgia Power, Good Energy, Greenko, Jera, Octopus Energy, Sembcorp, Sol Systems, SSE, Statkraft, TotalEnergies, Vattenfall, and more.

- Is hourly data widely available?

Yes. Hourly generation and consumption data are widely available today, as it is the basis for the operation of electricity markets and billing of electricity consumers. Without hourly data, large generators would not get paid for the power they produce, and large consumers would not know if they are being billed properly. This is especially true for the larger loads that would be required to do hourly accounting under the proposal. This systematic report of granular electricity data availability finds that even today, *"in most industrialized regions, granular consumption meter data is mostly available and accessible."* And, in cases where hourly data is not easily accessible, profiles of monthly or annual data can be used to ensure feasibility without losing integrity.

- How can a company do hourly accounting if they don't have access to hourly electricity data?

There are flexible options. If a company doesn't have access to hourly meter data, they can turn annual or monthly electricity data into hourly data by using load profile estimates, based on the proposed load profile hierarchy. There are multiple proposed options for how to do this. A company could use building or industry-specific load profiles, such as those used by electric utilities for billing for many years. Even easier, they could calculate a flat hourly load profile by dividing their monthly electricity consumption by the number of hours in the month.

While using actual hourly electricity data is ideal, using a flat hourly load profile would still significantly improve the accuracy of Scope 2 market-based inventories.

- Isn't this proposal prioritizing technical ambition over practical feasibility?

No. This proposal improves Scope 2 market-based inventory accounting based on the GHGP's decision-making hierarchy, which prioritizes scientific integrity and impact. However, feasibility is also top of mind for the Scope 2 TWG, and the proposal includes a number of accommodations to ensure feasible implementation of the new standard (such as exemptions for smaller loads, the use of profiles to estimate hourly data, phase-in periods for the new rules, and crediting for legacy clean energy contracts).

- Will I be able to count my existing procurements?

Likely yes. In recent voting, the TWG strongly supported the concept of allowing "legacy" long-term contracts signed before the update of the Scope 2 guidance to be included in a company's market-based reporting. However, to ensure robust implementation, a number of conditions will have to be met, and these are still being discussed.

6.3 Questions About Integrity of the Proposal

- Are tighter market boundaries still too big to be credible?

Market boundaries should better align with electricity markets while remaining practical enough to encourage broad participation. Defining market boundaries requires a balance of integrity and feasibility. Some argue the proposed market boundaries are too large to reflect all transmission constraints. At the same time, some say they're too narrow to support aggregation or recognize broader trading benefits. In fact, these boundaries strike a balanced, practical approach: they better align with how electricity is actually traded and avoid the overly broad definitions used today that allow clean energy claims disconnected from grid realities. The proposal strengthens deliverability criteria relative to the current method to ensure claims are more credible, yet feasible to implement.

- Will companies get credit for what is already on the grid?

Yes, but with some modifications to bolster scientific integrity. The proposal clarifies how to account for electricity from publicly funded, mandated, or shared resources such as those delivered through default utility service or government clean energy programs. It limits a company's claims to a fair and proportionate allocation of CFE resources that a company is required to support and disincentivizes shuffling of these shared CFE generation resources (e.g., public or regulated hydro or nuclear) to support exclusive voluntary claims. The proposal no longer allows the use of location-based, average emissions factors (which include clean energy that could be claimed by others) for unmatched consumption in market-based accounting. Instead, in the absence of supplier-specific emissions factors, companies would use residual mix factors or fossil-only emission rates to avoid double-counting of clean energy and claiming clean energy to which a company has no contractual link.

- Does the proposed update lead to double-counting of clean energy?

No. Some have claimed that the proposed updates would lead to double or triple counting of clean energy. This is false. The proposed updates by the TWG include provisions (e.g., defaulting to residual or fossil only mix rather than grid average mix) that help ensure that clean energy is not counted more than once.

- Electrons can't be traced, so why are we pretending that they can with hourly and local matching?

Nobody claims electrons can be traced from source to load. At the same time, no one reasonably claims that electrons can physically be delivered from source to load across the market boundaries currently used under today's scope 2 rules.

What we need to do is find reasonable temporal and geographic boundaries over which one can more *credibly* claim to access that clean power in most circumstances. Claiming to use solar at night or wind from a disconnected distant grid is not credible or reality-based.

Power markets deal with this question on a real-time basis and can serve as a template for market boundaries that more accurately reflect real power flows. Power markets match supply and demand (sub)hourly and within defined zones around the world. That's why this proposal uses similar temporal and spatial matching to already-established power markets.

Does this standard assume complete delivery of clean electricity from every claimed generator to every matched load? No. That would be unreasonable. But it

does represent a *significant* advancement in the certainty that far more electricity from claimed clean sources *could* be supplying the load to which it is matched (because it is generated at the same time and on the same power market grid as consumption).

The alternative to this reform is either deliverability regions so tight that the standard becomes too burdensome to use, or deliverability regions like today's that are so large they sacrifice total credibility and impact.

7. List of Evidence and Sources

Granular Accounting is not a niche concept; it is backed by evidence, regulations, and publications from the world's foremost institutions. Below, we provide a non-exhaustive list of sources for additional reading.

7.1 Empirical Evidence

Below we list some key studies presenting empirical evidence based on power sector capacity expansion modelling (the most robust way of studying policy interventions). All sources are from academic institutions, research institutes, or non-profit organizations. 10 of the 18 research pieces are peer-reviewed, appearing in some of the world's leading scientific journals including Nature and Joule.

Study	Institution	Journal
The Impact of Temporal Hydrogen Regulation on Hydrogen Exporters and Their Domestic Energy Transition	TU Berlin / Potsdam Institute for Climate Impact Research / University of Applied Sciences (OTH) Regensburg / Open Energy Transition	Nature Communications
Modelling 24/7 Carbon Free Electricity (CFE) in Asia	Transition Zero	Self - Published
24/7 Carbon-free Electricity Matching Accelerates Adoption of Advanced Clean Energy Technologies	TU Berlin / Princeton University / Google	Joule
The Influence of Demand-Side Data Granularity on the Efficacy of 24/7 Carbon-Free Electricity Procurement	Princeton University	Self - Published
Does the Purchase of Voluntary Renewable Energy Certificates Lead to Emission Reductions? A Review of Studies Quantifying the Impact	Denmark Technical University	Journal of Cleaner Production
On the Means, Costs, and System-level Impacts of 24/7 Carbon-free Energy Procurement	TU Berlin	Energy Strategy Reviews
Spatio-temporal Load Shifting for Truly Clean Computing	TU Berlin	Advances in Applied Energy
System-level Impacts of Voluntary Carbon-free Electricity Procurement	Princeton University	Joule

Strategies		
The influence of Additionality and Time-matching Requirements On the Emissions From Grid-connected Hydrogen Production	MIT	Nature Energy
Impacts of IRA's 45V Clean Hydrogen Production Tax Credit	EPRI	Self - Published
Minimizing Emissions From Grid-based Hydrogen Production in the United States	Princeton University	Environmental Research Letters
Hourly Versus Annually Matched Renewable Supply for Electrolytic Hydrogen	TU Berlin	Self - Published
IEA- Advancing Decarbonisation through Clean Electricity Procurement	International Energy Agency	Self - Published
System-level Impacts of 24/7 Carbon-free Electricity Procurement in Europe	TU Berlin	Self - Published
Electricity System and Market Impacts of Time-based Attribute Trading and 24/7 Carbon-free Electricity Procurement	Princeton University	Self - Published
Green Hydrogen – How Grey Can it Be?	Florence School of Regulation	Self - Published
System-level Impacts of 24/7 Carbon-free Electricity Procurement	Princeton University	Joule

7.2 Related Policies

Market-based accounting based on the 3-pillar approach, similar in design to what is being proposed in the GHGP update, has been enacted in legislation globally. Here is a non-exhaustive list of policies based on granular accounting approaches. All these policies went through rigorous public debate and scrutiny prior to enactment by independent governments and legislators.

Law	Region	Institution	Regulation Reference
US AI on Federal Lands with 3 Pillars	United States	US White House	Executive Order 14141 on Advancing United States Leadership in Artificial Intelligence Infrastructure
US Clean Hydrogen	United States	US Treasury	Final Rules 45v

"45v" Tax Credit			
EU 24/7 Hydrogen Standard	European Union	European Commission	Adopted Delegated Act
US Government 24/7 Target	United States	US Government	Presidential Executive Order 14057
United Kingdom 24/7 Hydrogen Standard	United Kingdom	United Kingdom Department for Transport	RTFO Guidance for Renewable Fuels of Non-Biological Origin
United Kingdom 24/7 Low Carbon Hydrogen Standard	United Kingdom	United Kingdom Department for Business, Energy & Industrial Strategy	Low-carbon Hydrogen Standard
Measures to Advance the Use of Hydrogen (US Colorado)	United States	State of Colorado	Measures to Advance the Use of Clean Hydrogen
Hourly Source Reporting Requirement	United States - California	Government of California	California SB1158
Irish Climate Action Plan (24/7 for Large Energy Users)	Ireland	Irish Government	2023 Climate Action Plan

7.3 Publications and Whitepapers

Some of the world's leading energy sector actors, think-tanks, and news outlets have published in support of granular matching and round-the-clock clean energy. Here is a non-exhaustive list:

Title	Author
Green Signals? Assessing Price Dynamics in the European Renewable Energy Certificate Market	Energy Strategy Reviews
Implications of Trading of 24/7 Carbon Free Energy	UK National Energy System Operator (NESO)
24/7/365 Solar and Batteries	EMBER
Plummeting Solar+Storage Auction Prices in India Unlock Affordable, Inflation-proof 24/7 Clean Power	University of California Berkeley
24/7 Carbon-Free Energy Procurement in APAC:	Global Renewables Alliance
Environmental Impacts of Artificial Intelligence	Greenpeace
Impacts and Feasibility of an Hourly-Matched Clean Electricity Standard in Minnesota	Princeton Zero Lab

Energy and AI - IEA (Hourly Matching Analysis)	International Energy Agency
24/7 Guidebook	SeForAll
Cost, Benefits and Contractual Design of 24/7 PPA	Enervis
LEU Electricity Emissions Reporting Framework	Sustainable Energy Authority of Ireland (SEAI)
EU Guarantee or Origin - Local Requirements	Aurora
24/7 Carbon-Free Energy Procurement in APAC: Pathways for Companies and Countries	Bloomberg NEF
How 24/7 Carbon Free Energy (CFE) Trading Will Impact Stakeholders	AFRY
Once in a Lifetime Change to Fix Corporate Emissions Reporting	Natural Resource Defense Council
A Roadmap for Designing Hydrogen Projects for 45v Compliance	RMI
Getting to 24/7 Carbon-free Energy – Practical Steps For Buyers and Suppliers	Eurelectric
Demanding Better	Sierra Club
24/7 Buyers Journey	Eurelectric
Enabling 24/7 Carbon-Free Energy: Modeling Tools and Decision Frameworks	Charles River Associates
Modernizing Industrial Energy Demand: Achieving 24/7 Clean Power Procurement and Consumption in Industry	World Economic Forum
GOing Granular - EU GO Market	Aurora
24/7 Carbon-Free Electricity Transition Tariffs: A Regulatory Tool for Accelerating Decarbonization	Regulatory Assistance Project
Public Comment from Rocky Mountain Institute on US Clean Hydrogen	RMI
Public Comment from Princeton Zero Lab on US Clean Hydrogen	Princeton Zero Lab
Public Comment from on Energy Innovation on US Clean Hydrogen	Energy Innovation
Assessing Lifecycle Greenhouse Gas Emissions Associated with Electricity Use for the Section 45V Clean Hydrogen Production Tax Credit	US Department of Energy
Short-run Marginal Emission Factors Neglect Impactful Phenomena and are Unsuitable for Assessing the Power Sector Emissions Impacts of Hydrogen Electrolysis	NREL, Princeton
Empowering Consumers to Accelerate 24/7 Carbon-Free Energy	SeForAll
US Hydrogen Guidance: Be Strict or Be Damned	Bloomberg NEF

Webinar: System-level Impacts of Voluntary Carbon Free Electricity Procurement Strategies	Princeton Zero Lab
Renewable Energy Procurement: Summary Report	United Kingdom Green Buildings
45V Hydrogen Tax Credit in the Inflation Reduction Act: Evaluating Emissions and Costs	Resources for the Future
How to Get Started with 24/7 CFE Journey	Flexidao
24/7 Carbon-free Energy: Matching Carbon-free Energy Procurement to Hourly Electric Load	EPRI
Views on a Future-Proof Market Design for Guarantees of Origin	ENTSO-E
Renewable Energy Certificates Threaten the Integrity of Corporate Science-based Targets	Nature Climate Change
LDES 24/7 PPA Report	LDES Council