

# GHGP Scope 2 Survey: REsurety Response

The REsurety response to both the Scope 2 and the Consequential Metric GHGP surveys are detailed below. Responses are due by January 31st, 2026 (as per recent [extension](#)) - draft yours today!

## RESOURCES

- [GHG Protocol Public Consultation homepage](#)
- Scope 2 Public Consultation
  - [Consultation materials](#) (proposal details)
  - [Consultation survey](#) (submission)
- Electricity-Sector Consequential Methods Public Consultation
  - [Consultation materials](#) (proposal details)
  - [Consultation survey](#) (submission)

## NAVIGATION: JUMP TO SECTION RESPONSE

1. [General Questions](#)
2. [Scope 2 Public Consultation Questions](#) (183 questions)
3. [Consequential Methods Public Consultation Questions](#) (52 questions)
4. [Sources Referenced in REsurety Response](#)



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# General

## General Demographics

1. Do you acknowledge and agree to the liability limitation, consideration of feedback, anonymity and public disclosure, legal compliance, and intellectual property statements? By submitting feedback, you acknowledge that you are doing so voluntarily and have read, understood, and agreed to this disclaimer and notice of rights. Please tick "Agree" to proceed with the survey.

- Agree

2. Did you read everything? Please check "yes" below to confirm that you have read the Scope 2 Public Consultation document associated with this survey before proceeding with your response. This document may be found on the main Scope 2 Public Consultation webpage where you accessed this survey.

- Yes

3. Make feedback anonymous? As part of the Greenhouse Gas Protocol's standard procedures, all responses will be made publicly available. However, respondents have the option to have their name, organizational affiliation, and country redacted from any public record of their response. Your e-mail will be automatically redacted from any public record, whether you opt-in here or not. Would you like to request the redaction of this information for your responses?

- Yes
- No

## Respondent information

*Please provide your respondent information. If you need support, please reach out to RESurety.*

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# Scope 2 Consultation Survey

## Section 3

18. 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.

We want to first acknowledge that the existing Scope 2 MBM is not perfect, but it is good. The existing guidance has successfully incentivized vast amounts of clean energy procurement globally, which we do not want to risk slowing. In our eyes this massive revision has the potential to either “do harm”, “do nothing”, or “do better” - and our response is focused on the idea that revisions should first and foremost “do no harm”. As currently drafted, we believe that the GHGP proposals threaten to undermine this progress, and risk doing more harm than good. As a result, we do not support changing the definition of Scope 2. The current definition of Scope 2 includes both consumption and procurement, which are two separate activities for companies. This is why the original GHGP guidance in 2014 correctly provided the LBM for consumption and the MBM for procurement. This key distinction still holds in 2025, and will well into the future.

Re-defining Scope 2 solely as an inventory misses the critical role that Scope 2 accounting plays in enabling voluntary investment that has been a primary driver of clean energy development. Companies must be able to aggregate their load across hours and locations to achieve the scale needed for impactful procurement that provides revenue-certainty and unlocks project financing (e.g., PPAs). [1],[2]

Lastly - it is simply not possible to make physical usage claims from grid connected assets as that mistakes a contractual flow with a physical flow. The Federal Energy Regulatory Commission made this clear in 1996 with FERC Order 888 (which underpins US transmission and electricity pricing methodologies) stating "The use of the contract path model of power flows... does not account for the actual power flows on a transmission system". That fact holds true today as was reinforced by Harvard's Professor Bill Hogan who recently wrote: "The Greenhouse Gas Protocol pursuit of a definition for indirect Scope 2 GHG emissions embedded in purchases of electricity is based on an implicit premise that is incompatible with the laws of physics...The GHGP is currently at risk of repeating a regulatory failure addressed 30 years ago by the U.S. electricity sector: the 'Contract Path' fallacy." [4] This view is shared by Resources For the Future's Aaron Bergman who recently wrote: "Even though electricity can be cleanly produced... 'clean' electricity cannot be traced across the grid from a generator to a consumer. What you consume is, simply, electricity... Clean Electricity is a Financial Transaction." [5] Similarly, 31 experts agreed that "in power systems, it is not possible to match individual production and consumption at different locations." [6]

[1] CEBA Report: Corporate Demand Drives Clean Energy, <https://cebuyers.org/wp-content/uploads/2025/09/CEBA-Report-Corporate-Demand-Drives-Clean-Energy.pdf>

[2] Case Study: Caught in the Middle - How hourly matching reduces impact for distributed loads, <https://img1.wsimg.com/blobby/go/15907343-a52a-4fb2-acba-527a9dd22090/Caught%20in%20the%20Middle-c029cc3.pdf>

[3] FERC Order 888 (1996): <https://www.ferc.gov/industries-data/electric/industry-activities/open-access-transmission-tariff-oatt-reform/history-oatt-reform/order-no-888>

[4] Scope 2: Physical Power Usage Accounting Is Fictional, Pricing And Marginal Impact Accounting Are Real, [https://whogan.scholars.harvard.edu/sites/g/files/omnuum4216/files/2025-12/Hogan\\_GHCP\\_121225.pdf](https://whogan.scholars.harvard.edu/sites/g/files/omnuum4216/files/2025-12/Hogan_GHCP_121225.pdf)

[5] What We're Actually Talking About When We Talk About Clean Electricity, <https://www.resources.org/common-resources/what-were-actually-talking-about-when-we-talk-about-clean-electricity/>

[6] Open Letter: Expert Consensus on Carbon Impact, <https://expertconsensusoncarbonimpact.com/>

19. Please provide any feedback on the proposed clarification to 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.

We agree that the LBM is the correct reporting mechanism to calculate the emissions impact of physical consumption.

20. 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.

While we support modernizing the Market Based Method (as described in other answers), we do not support changing its fundamental definition from a procurement metric to usage metric. The definition should not mandate hourly matching or physical deliverability. These should be optional reporting pathways alongside an equal Impact Accounting pathway that measures emissions across a reporter's contractual information and claims flow.

The current definition is clear that the MBM is not intended to represent emissions from consumption ("the certificate does not necessarily represent the emission caused by the purchaser's consumption of electricity"). The LBM tracks consumption. Rather, the MBM is intended to track procurement. Reporters should have multiple options for procurement pathways to maximize impact and continue to grow the critical support to date provided by voluntary procurement.

As expert support for this opinion we refer to Matthew Brander (carbon accounting expert and TWG member) who wrote: "The GHG Protocol proposes to clarify that the market-based method is for 'quantifying scope 2 from contractually purchased electricity via contractual instruments'. This is wholly misleading as the market-based method is only about the purchase of attribute instruments and not 'contractually purchased electricity.'" [1]

[1] Six things wrong with the GHG Protocol's proposals for market-based scope 2 accounting, <https://www.bccas.business-school.ed.ac.uk/sites/cbccs/files/2025-11/Six-things-wrong-with-the-GHG-Protocols-proposals-for-market-based-scope-2.pdf>

21. Please provide any feedback on the proposed purposes of the location-based method. Please note that feedback on specific changes to the location-based method can be provided in section 4.

We agree with proposed changes.

22. Please provide any feedback on the proposed purposes of the market-based method. Please note that feedback on specific changes to the market-based method can be provided in section 5.

We strongly disagree with proposed changes.

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## Section 4: Location-based method

23. On a scale of 1 - 5, do you support the update to the location-based emission factor hierarchy to identify the most precise location-based emission factor accessible according to spatial boundaries, temporal granularity, and emission factor type (consumption or production)?

Please note this question only relates to the structure of the hierarchy, subsequent questions will address its intended use.

Select only one:

- 1 - No Support
- 2 - Little Support
- 3 - Neutral
- 4 - General Support
- **5 - Full Support**

24. Please provide your reasons for support, if any.

Select all options that apply:

- Agree that guidance on selecting location-based emission factors should be presented as a hierarchy
- Enhances the accuracy and relevance of the location-based method
- Enables use of emission factors that support abatement planning and target-setting.
- Improves use of location-based method to provide risk and opportunity assessment related to consumption of grid electricity.
- Aligns with emission factors used by your organization for location-based emissions reporting
- Aligns with emission factors used for mandatory or voluntary reporting in your region
- Prioritizes consumption-based factors that include imports/exports over production-based factors.
- Clarifies application of the EF hierarchy (spatial > temporal > consumption-based > production-based)
- Agree with listing the most precise temporal granularity as "hourly"
- Agree with listing the most precise spatial boundary as "local boundary"
- Agree that the proposed spatial boundaries reflect electricity deliverability in your region
- Other (please provide)

Blank

25. Please provide comments regarding your reasons for support.

Blank

26. Please provide your concerns or reasons for why you are not supporting, if any.

Select all options that apply:

- Prefer guidance on selecting location-based emission factors to be identified as a single globally applicable option to increase comparability
- Concern about increased administrative burden and complexity from identifying the most precise emission factors accessible
- Concern that the most precise temporal granularity "hourly" is too detailed
- Concern that the most precise spatial boundary, "local boundary", is too narrow
- Concern that the proposed spatial boundaries do not reflect electricity deliverability in your region
- Concern hierarchy does not align with emission factors used by your organization for location-based emissions reporting
- Concern hierarchy does not align with emission factors used for mandatory or voluntary reporting in your region
- Prefer a different order (e.g., consumption-based first, then spatial boundary, then temporal granularity)
- Unclear how the changes will affect your GHG emissions reporting
- Other (please provide)

Blank

27. Please provide comments regarding your reasons for why you are not supporting (if any).

Blank

28. For different views on the order the hierarchy should be applied (e.g. preference for consumption-based emission factors, then spatial boundary, then temporal granularity) please explain the preferred order.

Blank

29. Regarding regions that you operate in or have experience in, please provide comments on whether the LBM emission factor hierarchy allows you to identify an accessible emission factor

that appropriately reflects how electricity is delivered in that region. Please clearly identify the region you are referring to in your answer

Blank

30. Regarding regions that you operate in or have experience in, please provide comments on whether the LBM emission factor hierarchy is likely to cause any region-specific challenges in its application.

Provide specific examples, and clearly identify the region you are referring to in your answer

Blank

31. Do you agree that "local boundary" should be listed as the most precise spatial boundary for LBM emission factors? If not, select which should be listed as the most precise spatial boundary?

Select only one:

- Yes, I support local boundary as the most precise spatial boundary
- No, a more precise spatial boundary should be added
- No, a less precise spatial boundary should be used. Use Operational grid boundary
- No, a less precise spatial boundary should be used. Use Grid-wide or national boundary
- Other (describe)

Blank

32. If you selected "Other" in question 31, please describe

Blank

33. Should the LBM emission factor hierarchy be adjusted to include the deliverable market boundaries outlined in the proposed MBM Methodologies for demonstrating deliverability where

they do not already overlap? If so, should they be included in addition to, or as a replacement for, the spatial boundaries currently proposed in the hierarchy?

Select only one:

- No, different spatial boundaries are appropriate for the location-based and market-based methods
- Yes, include the MBM deliverability market boundaries in addition to the proposed LBM hierarchy (explain why they should be added)
- Yes, include the MBM deliverability market boundaries as a replacement for the proposed LBM hierarchy (explain why they should replace the current hierarchy)
- Other (explain)
- Do not support boundaries as proposed in either method (explain alternative boundaries for the location-based emission factor hierarchy and how they support integrity, impact, and feasibility for a value chain inventory)

Blank

34. Please provide additional explanations or further details regarding your answer to question 33

Blank

35. On a scale of 1-5 do you support the new definition of accessible: publicly available, free to use, and from a credible source?

Select only one:

- 1 - No Support
- 2 - Little Support
- 3 - Neutral
- 4 - General Support
- 5 - Full Support

Blank

36. Please provide your reasons for support, if any.

Select all options that apply

- Definition supports feasibility and lower-cost reporting
- Supports transparency and public verifiability of emission factors
- Implements a common comparability baseline across reporters
- Creates data equity for smaller reporters and underserved regions
- Encourages open publication of emission factors
- High quality accessible emission factors already exist for most markets globally today
- Ensures reporters can immediately apply the updated LBM hierarchy
- Clarifies reporting requirements
- Other (please explain)

Blank

37. Please provide comments regarding your reasons for support.

Blank

38. Please provide your concerns or reasons for why you are not supporting (if any).

Select all options that apply:

- Definition needs further clarification about what is recognized as a credible source
- Definition should not exclude emission factors that are publicly available and credible even if they have a reasonable associated cost (i.e. not free)
- A list of suitable location-based emission factors should be published for each region, rather than requiring reporters to individually determine what is accessible in their region.
- Definition should also consider level of administrative effort in addition to external costs for emission factor data.
- Another criteria should be added to the definition
- Other (please explain)

Blank

39. Please provide comments regarding your reasons for concern (if any).

Blank

40. The following questions (40-43) concern which entities should qualify as credible sources for accessible LBM emission factors to ensure transparency, faithful representation, and comparability.

Which entities should qualify as credible sources:

Select all options that apply:

- Government agency
- System operator
- Recognized registry
- Accredited statistics body
- Independent methodology meeting minimum criteria (outlined in question 42)
- Other (please specify and explain)

Blank

41. Please provide additional comments concerning your selected credible sources, including at least one example per region you operate in or have experience with, if possible.

Blank

42. If you selected independent methodologies in question 40, please describe what documentation or assurance (if any) is needed for it to be recognized as a credible source?

Select all that apply, then add brief detail:

- Publicly documented methods and system boundaries
- Update cadence (e.g., annual) and version control
- QA/QC procedures and uncertainty disclosure
- Governance/independence and conflict-of-interest safeguards

- Geographic/system boundary and temporal coverage fit for use
- Other (please explain)

Blank

43. Please provide any additional comments concerning your selected minimum criteria in question 42.

Blank

44. On a scale of 1-5 do you support the update to the requirement to use the most precise location-based emission factor accessible for which activity data is also available?

Select only one:

- 1 - No Support
- 2 - Little Support
- 3 - Neutral
- 4 - General Support
- 5 - Full Support

Blank

45. Please provide your reasons for support, if any.

Select all that apply:

- Improves accuracy and scientific integrity of LBM results
- Strengthens transparency and public verifiability
- Enhances comparability across reporters and frameworks
- Better reflects grid operation in time and space, reduces misallocation

- Enables emission changes from storage and demand-flexibility to be reflected more accurately
- Prioritizes consumption-based factors that include imports/exports
- Aligns emission factor precision with available activity data
- Aligns positively with mandatory or voluntary reporting requirements in your region
- Enables use of load profiles when hourly activity data are unavailable
- Provides a common, accessible baseline for inventories
- Supports phased improvement as data availability expands
- Improves decision-usefulness for external disclosures
- Other (please provide)

Blank

46. Please provide any additional comments regarding your reasons for support.

Blank

47. Please provide your concerns or reasons for why you are not supporting.

Select all that apply:

- Concern about negative impact on comparability, relevance and/or usefulness of LBM inventories
- Concern that administrative, data management, and audit challenges posed by this approach would place an undue burden and costs on reporters
- Concern that the most precise spatial boundary in the LBM emission factor hierarchy, 'local boundary', is too narrow to require even when accessible
- Accessible factors may be less accurate than non-accessible options and primary users of emission reporting data may expect the most representative factors
- Material differences to inventory accuracy are too small to justify cost
- Concern about the update cadence or representativeness of datasets (hourly/monthly)
- Other (please provide)

Blank

48. Please provide any additional comments regarding your concerns or reasons why you are not supporting (if any).

Blank

49. For concerns or support for alignment with mandatory or voluntary reporting requirements in your region, please provide an example of the programmatic requirements and the impacts of these changes on alignment.

Blank

50. For concerns that the most precise spatial boundary (local boundary) is too granular to be required even if emission factors are accessible, please outline why and identify whether reporting at this level of granularity should be a “may”, “should” or “shall not” requirement?

Blank

51. For concerns that choosing an accessible factor over a more accurate “non-accessible” one can reduce accuracy and decision-usefulness please describe the conditions when a non-accessible factor should be required to be used over an accessible one (e.g., material difference threshold, investor relevance), and what transparency/assurance is needed (public methods, QA/QC, independent assurance). Please note any cost/effort implications.

Blank

52. Considering investor and assurance needs, how do the proposed location-based method revisions change the extent to which information is decision-useful to users relative to incremental cost and complexity for preparers?

Select only one:

No meaningful improvement (unlikely to change decisions/interpretations)

- Minor improvement (noticeable but unlikely to change decisions)
- Moderate improvement (could change some decisions/assessments)
- Substantial improvement (likely to change decisions benchmarks)
- Not sure / no basis to assess

Blank

53. Please provide additional context for your answer to question 52.

Blank

54. Considering investor and assurance needs, how do the proposed location-based revisions change the comparability of information relative to incremental cost and complexity for users?

Select only one:

- No meaningful improvement (unlikely to change decisions/interpretations)
- Minor improvement (noticeable but unlikely to change decisions)
- Moderate improvement (could change some decisions/assessments)
- Substantial improvement (likely to change decisions benchmarks)
- Not sure / no basis to assess

Blank

55. Please provide additional context for your answer to question 54

Blank

56. For question 52-55, please provide the basis for your assessment.

Select only one:

- Direct empirical analysis (e.g., back-testing with hourly factors)
- Operational experience (e.g. applying hourly LBM emission factors)
- Professional judgment informed by literature/briefings
- General awareness (no direct analysis)
- Prefer not to say

Blank

57. At the Operational Grid Boundary level (of the proposed location-based emissions factor hierarchy), what share of your load has hourly emission factors accessible:

Select only one:

- 0%
- 1-25%
- 26-50%
- 51-75%
- 76-100%
- Unsure
- Not applicable

Blank

58. Please provide additional context for your answer to question 57

Blank

59. Please indicate the share of your load with hourly activity data available:

Select only one:

- 0%
- 1–25%
- 26–50%
- 51–75%
- 76–100%
- Unsure
- Not applicable

Blank

60. If your answer to questions 57 & 59 includes significant geographical differences (some regions with hourly emission factor and higher volumes of hourly activity data, other regions with minimal hourly activity data and/or no hourly emission factors), please include additional context.

Blank

61. When actual hourly activity data are unavailable, and solely to enable use of more precise LBM emission factors, the proposed revisions allow a reporter to use load profiles to approximate hourly data from monthly or annual load data. How would the use of load profiles affect the comparability, relevance, and usefulness of LBM inventories relative to your current practice? Please describe potential advantages, limitations, and any conditions under which impacts may differ.

Blank

62. To help assess feasibility across geographies and company sizes, please answer from the same perspective you indicated in the Demographics section (e.g., your role and whether you're responding for a small/medium/large organization and your primary country). If you represent a multinational, answer from the primary country/entity you reported in Demographics (or note the specific business unit/country in comments).

On a scale of 1-5, please indicate the incremental preparer cost/effort to implement the proposed revisions to the location-based method.

Select only one:

- 1 - Minimal effort
- 2 - Low effort
- 3 - Neutral effort
- 4 - Moderate effort
- 5 - High effort
- Not applicable (not a preparer)

Blank

63. Please select the main drivers of cost/effort.

Select all that apply:

- Data access/rights to granular emission factors
- Hourly activity data availability/metering rollout
- Tooling/IT integration or data pipelines
- Assurance/internal controls readiness
- Staffing/capacity/training
- Contracting/procurement or budget cycle constraints
- Third-party publication cadence (emission factors)
- Multi-jurisdiction complexity (many grids/regions)
- Policy/regulatory or commercial terms
- Other: \_\_\_\_\_

Blank

64. Please provide additional context on the main drivers of cost/effort.

Blank

65. Which two measures would most reduce burden in your context?

Please select at most 2 options:

- Standardized publication of consumption-based emission factors by grid/system operators
- Load profile hierarchy/templates to approximate hourly activity data when meters are unavailable
- Phased implementation (staged effective dates)
- API/automated access to emission factor datasets
- Example calculations and disclosure templates
- Assurance safe-harbors for estimates
- Other (specify)

Blank

66. Please provide additional context on the measures that would most reduce burden in your context.

Blank

67. For which reporting year would your organization be ready to apply the revised Scope 2 Standard based on these proposed changes in its GHG inventory? (For example, if the Standard is published in 2027, the reporting year 2027 inventory is typically prepared and reported in 2028)

Select only one:

- Earlier than reporting year 2027 (already aligned)
- Reporting year 2027 (inventory prepared in 2028)
- Reporting year 2028 (inventory prepared in 2029)
- Reporting year 2029 (inventory prepared in 2030)
- Reporting year 2030 (inventory prepared in 2031) or later
- Later than Reporting year 2030
- Not applicable

Blank

68. Please provide additional context regarding how this timeline could be shortened and note any region or sector-specific context.

Blank

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## Section 5: Market-based method

69. 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):

Select only one:

- **a) [The US EPA's Emissions & Generation Resource Integrated Database \(eGRID\) - large map](#)**
- b) [DOE Needs Study Regions \(45V\) - large map](#)
- c) [Wholesale market/balancing authority - large map](#)
- d) Don't have operations or experience in the US

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

Select only one:

- 5 GWhs
- 10 GWhs
- **50 GWhs**

71. 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.

Select only one:

- **1 - No Support**
- 2 - Little Support
- 3 - Neutral
- 4 - General Support
- 5 - Full Support

72. 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)

Blank

73. Please provide comments regarding your reasons for support.

Blank

74. Please provide concerns or reasons for why you are not supporting, if any.

Select all that apply:

- A. More information is necessary to understand how investments not matched on an hourly basis will be accounted for and reported via the framework under development by the Actions & Market Instrument TWG
- **B. Hourly matching should follow an optional 'may' rather than a required 'shall' approach**
- C. Hourly matching should follow a recommended 'should' rather than a require 'shall' approach
- D. Concern about negative impact on comparability, relevance and/or usefulness of MBM inventories
- E. Concern that a phased implementation would be insufficient for development of the infrastructure necessary (e.g., registries, trading exchanges, etc.) to support hourly contractual instruments
- F. Concern that administrative, data management, and audit challenges posed by this approach would place an undue burden and costs on reporters
- **G. Concern that requiring hourly matching does not create meaningful improvements to inventory accuracy**
- **H. Concern that a requirement for hourly contractual instruments could discourage global participation in voluntary clean energy procurement markets**
- **I, Other (please explain)**

75. Please provide comments regarding your concerns or reasons for why you are not supportive.

Our perspective is driven by the fact that mandated hourly matching offers limited benefits to scientific rigor, but comes at a very high cost of discouraging impactful voluntary clean energy procurement.

Ultimately, we are guided by the goal of 'do no harm' to climate progress. In this context: Doing "harm" is mandating Hourly Matching (which discourages impactful procurement) < doing "nothing" is keeping the Status Quo (annual MBM) < doing "better" is an alternative approach that includes the measurement of carbon impact, like Impact Accounting (which maximizes climate investment). The current proposal, by mandating an overly complex and costly hourly matching requirement, moves the market toward 'Doing Harm,' which we cannot support.

1. Hourly matching requirements are expected to incentivize procurement of spot-market RECs at the expense of the long-term contracts that are critical to supporting project financing, reducing the rate of development of clean energy assets.

2. Hourly matching can incentivize behavior, such as the timing of charging and discharging of energy storage projects, that align with an individual reporting entity's carbon accounting needs at the expense of system-level benefits (grid resiliency, financial and environmental). As support, see the expert testimony from the Brattle Group which states: "hourly matching is inherently worse than annual matching, to the extent that it would induce decisions and operations that run contrary to the economic and reliability signals issued via RTO market dispatch" [8]

3. Hourly matching can unintentionally increase emissions. See for example the same expert testimony above: "In many cases, attempting to shift supply to match demand can have the unintended and counter-productive effect of increasing overall emissions"

4. Hourly matching is expected to increase costs to consumers. See for example the same expert testimony above: "Across all cases and sensitivities, we find that hourly matching would cost approximately \$21-1,210/MWh more on a delivered customer cost basis"

Re: Limited benefit to scientific rigor:

As was established in FERC Order 888 (in 1996) and regularly re-established by experts (including recent publications by RFF and Harvard on this topic [7,9]), there is no way to physically track electricity from one source of generation to a source of consumption on the grid. In addition, in order to make deliverability boundaries implementable in practice, they have been made so large as to no longer be credible, presenting a "catch-22" for the policy implementation where implementation feasibility and scientific rigor are mutually exclusive. This topic has been covered by a wide range of experts including the ZeroGrid consortium (RMI, Princeton, MIT, WattTime, REsurety). [1] Simply put: the improved scientific rigor of electricity "usage" claims is limited by the realities of grid physics.

Re: Mandatory hourly could discourage global participation in voluntary clean energy procurement markets:

As has been described by industry groups [2,3] and experts [4,5,6] it is widely expected that hourly matching will reduce voluntary demand for long term procurement of clean energy, which will slow the

decarbonization of the grid.

Given the above - we do not believe that the very high cost to impact is justified by the modest (and arguable) benefit to inventory accounting and usage claims.

[1] Expert Consensus Support for a Rigorous Definition of “Deliverability” in Scope 2 GHG

Accounting, [https://zerogrid.org/wp-content/uploads/dlm\\_uploads/2025/05/iai-deliverability-memo.pdf](https://zerogrid.org/wp-content/uploads/dlm_uploads/2025/05/iai-deliverability-memo.pdf)

[2] CEBA Calls for Immediate Changes to Greenhouse Gas Protocol’s Scope 2 Revision Process, <https://tinyurl.com/cebuyers>

[3] ACORE Letter to the GHG Protocol Independent Standards Board, <https://tinyurl.com/acoreletter>

[4] GHG Management Institute: Hourly Matching Claims for Scope 2 Reporting, <https://tinyurl.com/ghginstitute>

[5] Ever.Green: GHG Protocol Scope 2 Hourly Matching: Market Analysis and FAQ, <https://ever.green/insight/hourly-matching-faq>

[6] Six things wrong with the GHG Protocol’s proposals for market-based scope 2 accounting, <https://tinyurl.com/sixthingswrong>.

[7] How Could Changes to Corporate Greenhouse Gas Reporting Affect Emissions?, <https://tinyurl.com/RFFcorporatechange>

[8] Expert Testimony of Dr. Kathleen Spees and Dr. Long Lam before the Minnesota PUC, <https://www.brattle.com/wp-content/uploads/2025/03/Expert-Testimony-of-Dr.-Kathleen-Spees-and-Dr.-Long-Lam-before-the-Minnesota-Public-Utilities-Commission.pdf>

[9] Scope 2: Physical Power Usage Accounting Is Fictional, Pricing And Marginal Impact Accounting Are Real, [https://whogan.scholars.harvard.edu/sites/g/files/omnuum4216/files/2025-12/Hogan\\_GHCP\\_121225.pdf](https://whogan.scholars.harvard.edu/sites/g/files/omnuum4216/files/2025-12/Hogan_GHCP_121225.pdf)

76. 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.

Similar to the SSS defaults, many companies will need to use this option. The benefit of this option is that it will make hourly matching "easier" for organizations to implement. The con, however, is that it will reduce the claimed benefits of hourly matching (as it will blunt the signal for demand of scarce EAC hours) and it will hurt the comparability of results (an entity that uses actual hourly data may look "worse" than a peer simply because it uses more accurate data). Similar to the "catch-22" argument related to Deliverability discussed previously - making hourly matching easier to implement comes at the cost of sacrificing much of its stated benefits - creating a stark choice between rigor and feasibility.

More broadly, considering the amount of exceptions that are being considered to make hourly matching feasible (load threshold, exempt organizations, SSS defaults, legacy clause, load profile defaults, etc. etc.) - it begs the question: Why make something mandatory that requires so many exemptions - all of which reduce the benefits of hourly matching? As an alternative, we suggest that the GHGP include highly rigorous standards for claiming hourly matching (highly granular deliverability regions, requirement to use actual hourly data, etc. etc.) and make such a rigorous method an option: e.g. eliminate all of the exemptions and use "may" not "shall".

77. What is the approximate share of your organization's total load that would be subject to hourly matching, excluding any exemptions:

Select only one:

- **0%**
- 1-25%
- 26-50%
- 51-75%
- 76-100%
- Unsure

78. Please indicate your best estimate of the internal administrative effort (people/process/controls) of the proposed hourly matching requirement relative to your current MBM process using annual matching. Assume 3 is your current level of effort.

Select only one:

- 1 - Much less
- 2 - Slightly less
- 3 - Same
- 4 - More
- **5 - Much more**

79. Please indicate your best estimate of the external service cost (cash outlays to vendors, data, assurance) of the proposed hourly matching requirement relative to your current MBM process using annual matching. Assume 3 is your current external cost.

Select only one:

- 1 - Much less
- 2 - Slightly less
- 3 - Same
- 4 - More
- **5 - Much more**

80. What are the feasibility measures you would anticipate relying on:

Select all that apply:

- Load profiles for activity data (facility-specific)
- Load profiles for activity data (utility/customer-class or regulator-approved)
- Load profiles for activity data (time-of-use averages)
- Load profiles for activity data (flat average across hours)
- Load profiles for contractual instruments (same production asset)
- Load profiles for contractual instruments (facility-specific)
- Load profiles for contractual instruments (regional publicly available)
- Phased implementation
- Legacy clause

Blank

81. What are the assumed main drivers affecting internal workload and external service costs after applying feasibility measures:

Select all that apply:

- Registry/market access for hourly EACs
- Vendor/platform upgrades or new tools
- Data integration (profiles, APIs), system configuration
- Assurance/internal controls and evidence trails
- Staff capacity/training

- Contracting/sourcing changes for hourly instruments
- Metering/interval data access arrangements
- Other (specify)

Blank

82. Please provide any additional comments regarding your response to questions 77 - 81

The administrative challenge and cost burden of reporting hourly matching has been extensively studied. The range of cost impact varies, but the story is the same: costs increase for hourly matching.

- Over 90% hourly matching is needed to reduce emissions more than a 100% annual matching case, and costs for the last 10% of hourly matching skyrocket. Hourly matching levels of 90%, 98%, and 100% are 2.0, 3.1, and 4.1 times more expensive than non-local annual matching. [1]

- Adopting an hourly matching strategy is more costly than annual matching with eligible Energy Attribute Certificates (EACs), with estimated cost increases ranging from 0.35–3.76/kgH<sub>2</sub>. [2]

- The consensus range for the incremental cost for 24x7 matching is approximately 0.4–1/kgH<sub>2</sub>. [2]

- Hourly energy matching generally results in the highest carbon abatement cost per metric ton of CO<sub>2</sub> displaced, estimated to be approximately 7 to 14 times more expensive than marginal emissions matching. [3]

- For C&I load the cost premium for 84% temporal matching is \$8/MWh, increasing to \$27/MWh for 100% temporal matching with 25% participation and peaking at nearly \$40/MWh for higher participation rates [4]

[1] WattTime: Evaluating the Impacts, Costs, and Consequences of Proposed Scope 2 GHG Emissions Reporting Standards: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=5375940](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5375940)

[2] GHGP, Brattle: Assessment of Studies on US Hydrogen Tax Credits and Potential Takeaways for Scope 2 Guidance: <https://ghgprotocol.org/sites/default/files/2024-11/S2-TheBrattleGroupReport-20241121.pdf>

[3] TCR: [https://tcr-us.com/uploads/3/5/9/1/35917440/2024\\_april\\_cost\\_and\\_emissions\\_impact.pdf](https://tcr-us.com/uploads/3/5/9/1/35917440/2024_april_cost_and_emissions_impact.pdf)

[4] Princeton: <https://www.sciencedirect.com/science/article/pii/S2542435123004993>

83. 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?

Select only one:

- **1 - No Support**
- 2 - Little Support
- 3 - Neutral
- 4 - General Support
- 5 - Full Support

84. 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)

Blank

85. Please provide comments regarding your selected reasons for support.

Blank

86. Please provide reasons of concern or why you are not supporting, if any.

Select all that apply:

- **A. Proposed deliverability requirements do not improve alignment with GHG Protocol Principles**
- **B. Concern that narrower market boundaries restrict companies' abilities to invest in areas where renewable energy development could yield the greatest decarbonization impact**
- **C. Concern that narrower market boundaries could prompt a shift away from long-term agreements (i.e., PPAs) to spot purchases (unbundled certificates)**
- **D. Sourcing contractual instruments within deliverable market boundaries should follow an optional "may" rather than a required "shall" approach**
- E. Sourcing contractual instruments within deliverable market boundaries should follow a recommended "should" rather than a required "shall" approach
- F. Concern that the defined market boundaries do not align with mandatory or voluntary reporting requirements in your region
- G. Support deliverability in principle, but the proposed market boundary for my region does not reflect deliverability
- H. Market boundaries should be defined as the geographic boundaries of electricity sectors, which align with national, and under certain circumstances, multinational boundaries
- I. Exemptions to matching within deliverable market boundaries should be allowed for markets lacking sourcing options
- J. Other (please explain)

87. Please provide comments regarding your selected reasons for why you are not supporting.

In order for hourly matching to actually improve accounting accuracy and acknowledge the impacts of congestion, deliverability regions must be as small as possible (sub balancing authority level) [1,2]. But, narrower market boundaries restrict companies' abilities to invest in areas where renewable energy development could yield the greatest decarbonization impact.[3] Further, while there has been much attention given to procurement within deliverability regions being hard and/or expensive, it is important to note that in many instances satisfying this requirement is simply not possible.

Consider a company who has made the laudable internal and/or public commitment not to buy unbundled / spot EACs - they pursue their Scope 2 goals through long term procurement from greenfield clean energy projects. However, like the vast majority of companies that participate in voluntary PPA markets - while they have enough load in aggregate to sign utility-scale PPAs, by deliverability region they do not. It's viable to sign a 50, 75, or 100MW PPA to cover aggregate load, but if PPAs must match to rigorous deliverability regions, then the voluntary buyer is forced to search for 5, 10, 15MW PPAs which are often not possible or not economically viable to source given the transaction costs and realities of credit support for a utility scale project's financing. [4] As such, requiring same-region same-hour contracts would mean these organizations will have to choose between: 1) pursuing a procurement strategy that goes against their internal/public values (additional, bundled contracts, etc.) OR simply exiting the voluntary market entirely.

[1] ZeroGrid: [https://zerogrid.org/wp-content/uploads/dlm\\_uploads/2025/05/iai-deliverability-memo.pdf](https://zerogrid.org/wp-content/uploads/dlm_uploads/2025/05/iai-deliverability-memo.pdf)

[2] Johns Hopkins: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4972564](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4972564)

[3] Baringa: <https://www.baringa.com/en/insights/low-carbon-capital/the-corporate-catalyst/>

[4] Akamai: <https://img.wsimg.com/blobby/go/15907343-a52a-4fb2-acba-527a9dd22090/Caught%20in%20the%20Middle-c029cc3.pdf>

88. 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):

Select only one:

- a) [The US EPA's Emissions & Generation Resource Integrated Database \(eGRID\) - large map](#)
- b) [DOE Needs Study Regions \(45V\) - large map](#)
- c) [Wholesale market/balancing authority - large map](#)
- d) Unsure
- **e) Other**

89. 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.

None of the options listed (a, b, or c) are sufficiently rigorous to support the goal of scientific integrity - as a consortium of experts (RMI, MIT, Princeton, etc.) at ZeroGrid made clear [1]

Our recommendation would be to ensure that procurement within the same deliverability region is defined as a may not a shall, and that the deliverability region be tied to trading markets that are defined where there is consistent frequency of congestion apparent in pricing. For example, for ERCOT in Texas (which is to our knowledge the single power market with the most voluntary PPA activity to date) the deliverability regions would map to pricing zones or hubs (ERCOT South, North, Houston, West, Panhandle etc.).

This would provide an optional framework to claim power that is as close to deliverable as feasible (albeit while ultimately not possible), without imposing onerous reporting requirements on the majority of companies who are either 1) not able to handle the increased administrative burden, or 2) focused on a different theory of change (e.g., emissions impact)

For additional information on the risks of weakly-defined deliverability regions, and how ERCOT can serve as a litmus test for scientific integrity, see the answer to 152.

[1] ZeroGrid: [https://zerogrid.org/wp-content/uploads/dlm\\_uploads/2025/05/jai-deliverability-memo.pdf](https://zerogrid.org/wp-content/uploads/dlm_uploads/2025/05/jai-deliverability-memo.pdf)

90. 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, please describe this boundary

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

Similar to the US, we believe that location-matching should be a "may" not a "shall" and for those who choose to opt into this requirement the definitions should be as small as necessary to align with how power markets manage congestion challenges through hub/zonal pricing.

91. 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.

Blank

92. Please estimate the anticipated internal administrative effort (people/process/controls) of the proposed deliverability requirement relative to your current MBM process using broad market boundaries. Assume 3 is your current level of effort.

Select only one:

- 1 - Much less
- 2 - Slightly less
- 3 - Same
- 4 - More
- **5 - Much more**

93. Please estimate the anticipated external service cost (cash outlays to vendors, data, assurance) of the proposed deliverability requirement relative to your current MBM process using broad market boundaries. Assume 3 is your current external cost.

Select only one:

- 1 - Much less
- 2 - Slightly less
- 3 - Same
- 4 - More
- **5 - Much more**

94. What are the feasibility measures you would anticipate relying on to report using deliverable market boundaries:

Select all that apply:

- **Phased implementation**
- **Legacy clause**

95. What are the assumed main drivers affecting internal workload and external service costs after applying feasibility measures:

Select all that apply:

- A. Data access/rights for EACs/registries aligned to deliverable market boundaries
- B. Vendor/platform upgrades or new tools
- C. Data integration (profiles, APIs), system configuration
- D. Assurance/internal controls and evidence trails
- E. Staff capacity/training
- **F. Contracting/sourcing changes for contractual instruments within deliverable market boundaries**
- G. Metering/activity data reporting configured to match deliverable market boundaries
- H. Other (specify)

96. Please provide any additional comments regarding your response to questions 92-95.

It is true that all of the above answers for question #95 will increase workload and external service costs, but we only selected option (F) in order to highlight that the magnitude of contractual changes will greatly surpass other cost increases. For organizations with regional/global distributed loads, the inability to aggregate into one contract (and instead fragment into many smaller contracts to comply with hourly matching) will be existential. Relevant research findings on this topic attached below:

[1] Case Study: Caught in the Middle - How Hourly Matching Reduces Impact for Distributed Loads, <https://img1.wsimg.com/blobby/go/15907343-a52a-4fb2-acba-527a9dd22090/Caught%20in%20the%20Middle-c029cc3.pdf>

[2] Cost and emissions impact of voluntary clean energy procurement strategies, [https://tcr-us.com/uploads/3/5/9/1/35917440/2024\\_april\\_cost\\_and\\_emissions\\_impact.pdf](https://tcr-us.com/uploads/3/5/9/1/35917440/2024_april_cost_and_emissions_impact.pdf)

[3] Review of Research on the Impact of Voluntary Energy Procurement, [https://zerogrid.org/wp-content/uploads/dlm\\_uploads/2025/05/iai-review-research-voluntary-energy-procurement.pdf](https://zerogrid.org/wp-content/uploads/dlm_uploads/2025/05/iai-review-research-voluntary-energy-procurement.pdf)

[4] Evaluating the Impacts, Costs, and Consequences of Proposed Scope 2 GHG Emissions Reporting Standards, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=5375940](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5375940)

97. 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.

Select only one:

- 1 - No Support
- 2 - Little Support
- **3 - Neutral**
- 4 - General Support
- 5 - Full Support

98. 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)**

99. Please provide comments regarding your selected reasons for support.

We believe the GHGP's proposal for SSS is well intentioned to avoid double counting. It is that conceptual intention that we support.

However, we see two major concerns with the SSS proposal:

- 1) The details of how SSS will be implemented in practice remain vague, raising concerns over the continued risk of double counting, gamesmanship for implementations, etc.
- 2) It appears to be used by hourly-matching advocates to claim that hourly matching and deliverability satisfy the "three pillars" argument that was made regarding Green Hydrogen (45V). TWG Member Energy Tag explicitly states "Standard Supply Service currently serves as the incrementality pillar of this proposal", which blurs the lines the GHGP has specifically drawn between Inventory Accounting (MBM) and Impact Accounting (MIM). [1] It is important that the GHGP not allow the SSS to be used as a means to imply that the Inventory Method has consequential elements or intentions. Alternatively, if the GHGP is open to that blurring of the Inventory and Impact lines, the GHGP would be much better served by incorporating Impact/Consequential Accounting into Scope 2.

It is also important to avoid the need for companies to independently calculate their own share, apply this on a pro rata load share basis, and avoid double counting. It is also important to highlight that SSS data will be difficult to obtain for reporting organizations, and it seems likely that many will rely on default annual values. This would not support consistent treatment of shared supply across market structures, and would hurt the credibility/accuracy of market-based accounting. Using SSS data as proposed only makes sense for those that actually have access to hourly SSS data.

[1] Energy Tag: <https://scopetrue.org/wp-content/uploads/2025/11/GHGP-Scope-2-Public-Guidebook.pdf#page=23>

100. Please provide concerns or why you are not supporting.

Select all that apply:

- A. Markets should self-determine how resources that fall under SSS are allocated to customers
- **B. Concern of regionally applicable challenges to implementation**
- **C. Unclear how partial subsidies affect SSS classification**
- **D. Unclear rules/definition of SSS**
- **E. All contractual instruments should be eligible for voluntary procurement.**
- F. Other (please explain)

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

Per the answer to Q#98 above, we are concerned that SSS will be used to make consequential claims (e.g. "Incrementality") within an attributional method.

102. Are there resources in your region that do not fit clearly within the outlined examples of SSS but should be allocated to all customers under this framework? If so, please provide examples and explanations for each.

Blank

103. Are there resources in your region that fit within the outlined examples of SSS but should not be allocated to all customers under this framework? If so, please provide examples and explanations for each.

Blank

104. 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

Blank

105. Please provide any additional comments regarding your response to question 104.

Blank

106. 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?

This is the key issue for applying hourly matching using SSS data. Many organizations will not be able to retrieve this data, let alone at the hourly level. In the absence of a registry, it is likely that annual average SSS shares will be allocated. If hourly matching is required, annual/average/default SSS allocation does not make sense.

Our stance remains to make hourly matching optional, and that SSS definitions be set up to provide the rigor needed for rigorous EAC matching claims (per comments above, we do not think it is possible to make scientifically rigorous electricity usage claims given the reality of grid physics).

107. 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?

Select only one:

- Yes
- **No**
- Unsure

108. If you answered "No" to question 107, please provide any additional comments on why you would not support a default option

Enter your answer

Providing a default strays from the intention of hourly matching (if mandated, which we are against), as described in Q#106.

109. 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)

Blank

110. If you answered 'Other' please provide additional feedback.

Blank

111. 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?

As described in Q#106, SSS data (at either hourly or annual levels) will be difficult and in some cases impossible to obtain for many organizations. Mixing annual and hourly granularities, introducing defaults, or requiring it in some regions and not others are all likely pathways that risk comparability. Specifically, this would reduce comparability between reporters within the MBM.

To reduce inconsistency, the GHGP should consider a useful Impact Accounting method in which reporters measure and report on their emissions caused by energy consumption and avoided by voluntary procurement, and SSS allocation does not apply. See our answer to question 152 for more details on what we would propose to this effect.

112. Please provide any additional feedback on SSS.

Blank

113. 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?

Select only one:

- 1 - No Support
- 2 - Little Support
- 3 - Neutral
- 4 - General Support
- **5 - Full Support**

114. Please provide reasons of support, if any.

Select all that apply:

- **A. Establishes clear definition for residual mix emission factors**
- **B. Improves accuracy and relevance of market-based reporting**
- **C. Protects the integrity of market-based accounting by avoiding double counting of attributes within the MBM**
- **D. Clarifies the market boundary a residual mix emission factor should be calculated for**
- **E. Improves comparability and transparency across organizations and regions**

- **F. Helps incentivize voluntary sourcing of contractual instruments**
- **G. Provides an option for reporters without access to an hourly residual mix emission factor**
- H. Other (please explain)

115. Please provide comments regarding your selected reasons for support.

Blank

116. Please provide reasons of concern or why you are not supporting, if any.

Select all that apply:

- Requiring a residual mix emission factor to be calculated per market boundary will further reduce availability of residual mix emission factors
- Allowing reporters to use different temporal precision of residual mix emission factors within a deliverable market boundary will negatively impact comparability
- Market boundaries used for calculating a residual mix emission factor should be defined as the geographic boundaries of electricity sectors, which align with national, and under certain circumstances, multinational boundaries
- Markets should self-determine if Standard Supply Service is included in a residual mix emission factor
- Increases administrative complexity of calculating a residual mix emission factor
- Other (please explain)

Blank

117. Please provide comments regarding your selected reasons for why you are not supporting.

Blank

118. In the regions/markets you follow, how close are certificate systems / registries / data providers to being able to publish residual mix emission factors within deliverable market boundaries? (For

the US, please answer in regard to your preferred deliverable market boundary as outlined in Section 5.3.1 question 69.)

Select only one:

- 1 - Far from ready
- 2 - Somewhat ready
- 3 - Neutral
- 4 - Mostly ready
- 5 - Largely ready
- Insufficient basis to assess

Blank

119. Short comment (optional  $\leq 100$  words): Name regions where this already works vs. does not, in your view.

Blank

120. Please indicate your expected lead-time to reach "ready" (score 4-5), based on your current trajectory:

Select only one:

- <12 months
- 12-24 months
- 24-36 months
- >36 months
- Unknown

Blank

121. Please indicate your expected lead-time to reach "ready" (score 4-5), if investment/coordination accelerate:

Select only one:

- <12 months
- 12–24 months
- 24–36 months
- >36 months
- Unknown

Blank

122. Please describe the basis for your assessment:

Select only one:

- Public roadmap/docs
- Operator/vendor commitments
- Pilot/production use
- Professional judgment
- Other (specify)

Blank

123. Please provide any additional feedback on residual mix emission factors.

Blank

124. 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?

Select only one:

- 1 - No Support
- 2 - Little Support
- 3 - Neutral
- 4 - General Support
- **5 - Full Support**

125. Please provide reasons for support, if any.

Select all that apply:

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

126. Please provide comments regarding your selected reasons for support.

Using a fossil-based emissions factor in the absence of residual mix ensures a conservative view on emissions impact that prevents double counting which will be common in high renewable penetration grid regions.

127. Please provide reasons for concern or why you are not supporting, if any.

Select all that apply

- Defaulting to fossil-based emission factors is overly conservative and may overstate actual emissions
- Organizations that lack access to residual mix data due to systemic or regional limitations may be disproportionately impacted
- Undermines comparability between organizations that can access residual mix data and those that cannot
- Misaligned with the definition and/or purpose of the MBM
- Other (please specify)

Blank

128. Please provide comments regarding your selected reasons for why you are not supporting.

Blank

129. 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?

Blank

130. 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?

Select only one:

- **1 - Insufficient**
- 2 - Somewhat sufficient
- 3 - Sufficient
- 4 - Moderately sufficient
- 5 - Highly sufficient
- No basis to assess

131. Please provide any additional comments regarding load profiles that need adjustment to support implementation of the proposed market-based revisions at scale. Explain how changes would make implementation feasible without undermining accuracy and integrity of the MBM.

While we appreciate the intent to improve feasibility, the creation of exemptions significantly reduces the comparability and utility of reported values while also not improving scientific integrity as actual hourly values often differ materially from representative profiles. We continue to believe that the GHGP's goals of scientific rigor, impact, and feasibility, would be significantly better served by an option to pursue rigorous hourly matching, rather than a mandate to pursue a watered down version of hourly matching (large grid regions, lots of exemptions, etc.). In parallel, the GHGP should enable an equally credited and useful option for reporting entities to pursue an Impact Accounting method (e.g., Consequential).

132. Please provide any additional comments regarding phased implementation that need adjustment to support implementation of the proposed market-based revisions at scale. Explain how changes would make implementation feasible without undermining accuracy and integrity of the MBM.

For the reasons we have stated in responses to earlier questions, we do not believe the current proposal serves the GHGP's goals of Scientific Rigor, Impact and Feasibility. While a delayed implementation would address some of the Feasibility concerns, it would not address the concerns related to Scientific Rigor and Impact. Delaying the implementation of a significantly flawed proposal won't change the fact that it is significantly flawed.

133. Please provide any additional comments on other feasibility measures (not outlined in questions 131-132) that need adjustment to support implementation of the proposed market-based revisions at scale. Note, any comments on exemptions to hourly matching and the legacy clause should be provided in sections 6 and 7.

The best way to improve feasibility while maintaining scientific rigor is to make hourly matching and location matching optional. There is no way to avoid the "catch-22" of feasibility and rigor for the reasons stipulated in our prior answers, and as such we think the GHGP's goals are best served by allowing hourly/location matching to be pursuable by the small subset of entities that believe it to be 1) viable for the operations of and 2) relevant to the impact goals of their organization.

[1] CEBA Calls for Immediate Changes to Greenhouse Gas Protocol's Scope 2 Revision Process, <https://cebuyers.org/blog/ceba-calls-for-immediate-changes-to-greenhouse-gas-protocols-scope-2-revision-process/>

[2] Cost and emissions impact of voluntary clean energy procurement strategies, <https://www.sciencedirect.com/science/article/pii/S1040619024000186>

[3] TWG proposal, <https://marginalimpactmethod.org/>

134. Considering investor and assurance needs, how do the proposed market-based method revisions change the extent to which information is decision-useful to users relative to incremental cost and complexity for preparers?

Select only one:

- **A. No meaningful improvement (unlikely to change comparability/interpretations)**
- B. Minor improvement (noticeable but unlikely to change comparability)
- C. Moderate improvement (could change some comparability/assessments)
- D. Substantial improvement (likely to change comparability benchmarks)
- E. Not sure / no basis to assess

135. Please provide additional context for your answer to question 134.

The current proposal requires location matching within large regions (where "deliverability" is suspect and physical sourcing claims are not possible), requires hourly matching for many but not all instances (making comparability and interpretation difficult) and includes multiple feasibility exemptions that again make comparability and interpretation difficult. In short: the proposal increases the cost to reporting entities without improving the scientific rigor or utility of the downstream report.

136. Considering investor and assurance needs, how do the proposed market-based revisions change the comparability of information relative to incremental cost and complexity for users?

Select only one:

- **A. No meaningful improvement (unlikely to change comparability/interpretations)**
- B. Minor improvement (noticeable but unlikely to change comparability)
- C. Moderate improvement (could change some comparability/assessments)
- D. Substantial improvement (likely to change comparability benchmarks)
- E. Not sure / no basis to assess

137. Please provide additional context for your answer to question 136.

Please see response to Q#135.

138. For questions 134-137, please provide the basis for your assessment

Select all that apply:

- **A. Direct empirical analysis (e.g., back-testing with hourly factors)**
- B. Operational experience applying hourly MBM
- **C. Professional judgment informed by literature/briefings**
- D. General awareness (no direct analysis)
- E. Prefer not to say

139. Please estimate the anticipated change in procurement cost (i.e., price paid) for hourly-matched, deliverable EACs and/or PPAs relative to your current sourcing strategy. Assume 3 is your current external cost.

Select only one:

- 1 - Much less
- 2 - Slightly less
- 3 - Same
- 4 - More
- **5 - Much more**

140. What are the assumed main drivers affecting procurement price differences for hourly/deliverable EACs/PPAs relative to your current sourcing strategy:

Select all that apply:

- **A. Hourly matching and deliverability requirements may change prices due to supply available at specific times and locations of demand**
- **B. Shaping/firming or storage products required to align hourly supply with load**
- C. Contract tenor or credit/collateral requirements that increase all-in price
- **D. Need to structure multiple smaller PPAs instead of one large, aggregated contract, reducing economies of scale and increasing fixed transaction and development costs**
- **E. If an entity elects to self-supply hourly matched, deliverable EACs exclusively via PPAs (and not use secondary/spot EAC markets), over-procurement may be needed to ensure full hourly coverage across deliverable sites and periods**
- **F. Procurement costs to purchase EACs in secondary/spot markets to cover residual hours**
- G. Other (please explain in next question)
- H. None

141. Please provide any additional comments on the anticipated change in costs for hourly-

matched, deliverable EACs, PPAs, etc. relative to current practices. If applicable, please include comments if and how this would impact your procurement strategy for carbon free electricity?

The major concerns we have with the impact of hourly matching on procurement strategies and subsequently the clean energy transition are, in order of importance, 1) hourly matching requirements will fragment PPAs, 2) hourly matching requirements will incentivize overprocurement, and 3) hourly matching requirements will lead to storage limitations. Nearly every analysis of hourly matching has made it clear it requires a significant price premium. A small subset of examples includes:

Princeton (peer reviewed) [1]

"Temporal matching incurs a greater cost premium, as this strategy requires the generation of CFE even in hours when output from low-cost wind and solar is at a minimum. They also require the operation of procured generation and storage capacity in a manner that is not necessarily aligned with price incentives from the broader electricity market (see Figure S20). For C&I load in California with 10% participation, the cost premium for 84% temporal matching is \$8/MWh. This increases to as much as \$27/MWh for 100% temporal matching in the 25% participation case when only established technologies are available. At higher participation rates, the cost of 100% temporal matching increases further, peaking at nearly \$40/MWh"

TCR (peer reviewed) [2]

"Hourly energy matching costs are higher, ranging from \$68/MWh to \$181/MWh, depending on region and load profile"

Brattle Group [3]

"Prior studies conducted for different geographies and system conditions show hourly energy matching costs in the range of \$1–255/MWh more than annual matching". "Across all cases and sensitivities, we find that hourly matching would cost approximately \$21-1,210/MWh more on a delivered customer cost basis"

This premium will price many organizations out of the clean energy market; reducing voluntary clean energy purchases that are critical to getting new projects built. [4]

Deliverability requirements will also fragment PPAs, significantly reducing the load that many corporate buyers can aggregate to help fund projects, and pushing them towards less impactful unbundled REC purchases [5].

[1] Princeton: <https://www.sciencedirect.com/science/article/pii/S2542435123004993>

[2] TCR: <https://www.sciencedirect.com/science/article/pii/S1040619024000186>

[3] Brattle Group: <https://www.brattle.com/wp-content/uploads/2025/03/Expert-Testimony-of-Dr.-Kathleen-Spees-and-Dr.-Long-Lam-before-the-Minnesota-Public-Utilities-Commission.pdf>

[4] CEBA: <https://cebuyers.org/wp-content/uploads/2025/09/CEBA-Report-Corporate-Demand-Drives-Clean-Energy.pdf>

[5] PCA: <https://img1.wsimg.com/blobby/go/15907343-a52a-4fb2-acba-527a9dd22090/Caught%20in%20the%20Middle-c029cc3.pdf>

142. Beyond Scope 2 reporting, do the proposed MBM criteria (hourly matching, deliverability, inclusive of feasibility & transition design) pose material IFRS/GAAP financial-reporting impacts for PPAs or similar instruments (e.g., IFRS 9 own-use/hedge accounting, IAS 37 onerous contracts)?

- 1 - No impacts
- 2 - Low impacts
- 3 - Neutral impacts
- 4 - Moderate impacts
- 5 - Significant impacts

Blank

143. Please briefly explain your rating: identify which accounting areas could be affected and why (for example, IFRS 9 own-use eligibility, hedge accounting, IAS 37 onerous-contract risk), and note the main factors driving the impact (for example, hourly matching, deliverability, contract terms such as tenor, penalties, or close-out provisions).

Blank

144. If mid-high impacts: select affected areas:

Select all that apply:

- Own-use
- Hedge accounting
- IAS 37
- Other (please explain)

Blank

145. For each area selected in question 144, briefly note key drivers (e.g., main contract or accounting features driving the impact).

Blank

146. 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?

Select only one:

- A. Yes
- **B. Somewhat**
- C. No
- D. I do not support the development of impact metrics outside the scope 2 inventory.

147. If you answered “yes” or “somewhat” to question 146, which of the following rationale captures your views?

Select all that apply:

- **A. Allows for continued investment in electricity projects outside of my deliverable market boundary**
- **B. Provides a complementary metric to quantify actions such as energy storage or demand response**
- **C. Causes less disruption of existing electricity procurement practices**
- **D. Provides additional relevant information for users of GHG data**
- **E. Provides additional approaches for target setting**
- F. Other (please specify)

148. Please provide comments regarding your selected choices in question 147.

It is critically important to note that all of these benefits from a Consequential metric are conditional upon it being 1) a viable option for corporate reporting, and 2) mandatory. Based on the publicly available meeting minutes from the TWG Consequential Subgroup, as well as their recent public letter, it is our understanding that what the TWG overwhelmingly voted to advance (74%) would have achieved these goals.[1],[2]

However, the ISB has rejected that proposal and the proposal included in the consequential public comment period does not achieve any of these benefits as it is not viable for corporate reporting and as such will be irrelevant to decision-making. Most critically, the ISB put forth a method that only allows for the calculation of avoided emissions and not the calculation for emissions caused by consumption, missing half the equation. In the absence of the ability to calculate emissions caused AND avoided, a consequential metric will remain a tool that the GHGP offers and nobody uses (as has been the case with Project accounting for nearly 20 years). We strongly encourage the GHGP to reconsider its rejection of the recommended methodology set forth by the expert Technical Working Group. If not - we do not believe the consequential metric will provide any form of viable alternative to the MBM.

[1] TWG: <https://marginalimpactmethod.org>.

[2] TWG Meeting #16 Minutes: <https://ghgprotocol.org/sites/default/files/2025-07/S2-Meeting16-Minutes-20250625.pdf>

149. 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.

Including a consequential metric outside of Scope 2 does not change our perspective on Scope 2 revisions. We commend the GHGP for adjusting the timeline of the consequential impact metric to align with that of the new Scope 2 MBM and LBM revisions. However, there are two major missing links in the consequential metric as it stands:

1. The current proposed metric **does not include impacts from load** - it only counts the impacts of procurement (i.e. "avoided emissions"), and not the impacts of usage (emissions caused by consumption). In order to measure an organization's impact, the emissions caused by energy use must be accounted for at the load site, alongside the emissions avoided by clean power generation at the generation site.

2. It is outside of Scope 2. Excluding the consequential method as an equally viable option to the LBM or MBM prevents organizations from using it to measure impact and incentivize extremely impactful clean power investments. The current proposal as it stands closely mirrors what has previously been referred to as "Project Accounting", which is not used in practice for Scope 2 and needs adjustments in order to be applicable. If Consequential Accounting must live outside of Scope 2, to maintain Scope 2 as a pure inventory with no consideration of impact, the hourly matching should be an option ("shall" not "must") alongside annual matching in the MBM with Consequential Accounting as a third, mandatory disclosure alongside LBM and MBM.

150. 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)

Blank

151. Please provide comments regarding your selected choices in question 150.

Blank

152. 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.

We urge the GHGP to adopt a "Dual-Track" approach to the Scope 2 MBM, where reporting entities may opt into either (or both) of two distinct tracks:

1. Market-Based Inventory ("MB Inventory") This track focuses on attributional accounting with two sub-options: A. Standard Inventory: A more accurate version of the current Market-Based Method (annual matching, with increased rigor due to proposed updates included herein e.g. SSS). B. High-Fidelity Inventory: A more rigorous standard for hourly matching of 'deliverable' energy ("24/7 CFE"). This option requires a rigorous definition of deliverability and permits no exemptions.

2. Market-Based Impact ("MB Impact") This track utilizes consequential accounting - similar to the Technical Working Group's proposal - including the rigorous calculation of both emissions caused by consumption against emissions avoided by procurement.

## **Rationale**

I. Scientific integrity: 24/7 CFE offers benefits, but experts consistently condition those benefits upon rigorous implementation. This creates a "Catch-22": the GHGP must choose between defending scientific integrity (strict rules) or enabling feasible implementation at scale (loose rules). The current proposal attempts to mandate 24/7 CFE but seeks to improve feasibility via loose rules (lose deliverability definitions, multiple exemptions, etc.). We view mandated 24/7 CFE with loose rules as a "worst of both worlds": increased cost and complexity for all, with limited gains in scientific integrity and damaging impact.

We believe scientific integrity and impact are better served by making the "High-Fidelity" definition optional but rigorous.

To illustrate the drawback of loose rules, consider Texas as a litmus test for the rigor of deliverability. The ERCOT grid is electrically large (~2x the peak load of Spain) and geographically vast (~2x the physical area of Japan). More importantly, it has heterogeneous transmission congestion. In October 2025, the value of power in ERCOT South was >50% higher than in the ERCOT Panhandle (based on zonal average LMP), reflecting significant and persistent transmission congestion. As such, treating ERCOT as a single deliverability region fails any reasonable test for scientific integrity (as has been explicitly stated by Johns Hopkins, Energy Innovation and the experts in RMI's ZeroGrid impact advisory initiative). Yet, all three proposed consultation deliverability options would treat ERCOT as a single region. The purported benefits to scientific integrity of a 24/7 CFE implementation cannot be defended unless these physical realities are acknowledged and addressed.

II. Climate Impact: For the majority of reporting entities, rigorous hourly matching is either technically infeasible or misaligned with their climate impact goals. If the GHGP mandates it, these entities are likely to curtail/abandon their voluntary procurement activities, or switch to lower-impact options (e.g. purchasing spot RECs vs. procuring long term contracts to support the bankability of new builds). By including a MB Impact method within Scope 2, the GHGP empowers these entities to report and make decisions based on a MB carbon impact - helping to remove the historical barriers to adopting Project Based consequential accounting.

Hourly matching as proposed will not drive impact because it is attributional and lacks additionality criteria, the "third pillar" nearly all research deems critical for impact with hourly matching. Adding a MB Impact method as described above alongside the MB Inventory methods (annual matching with

increased rigor, and High-Fidelity hourly matching) is the only way to ensure the GHGP achieves its core Scope 2 goals: scientific integrity, global carbon impact and feasibility.

We assert that revisions should be judged on their ability to drive climate impact, following the hierarchy: 'Do Harm' (Hourly Matching) < 'Do Nothing' (Status Quo Annual MBM) < 'Do Better' (Market-Based Impact Accounting). The current proposal for mandated hourly matching risks placing the GHGP in the 'Do Harm' category.

III. Feasibility: We view Feasibility as an input to Impact. If a reporting obligation is not feasible, it will not incentivize voluntary procurement. Less procurement means less investment in clean energy infrastructure and, consequently, higher carbon emissions. Our proposal prioritizes a pathway (optional High-Fidelity MB Inventory and alternative MB Impact) that ensures feasibility for the mass market while codifying and rewarding those who go above and beyond the status quo either through more rigorous inventory statements or the newly-available rigorous impact statements.

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## Section 6: Exemptions - Hourly Matching Exemption Threshold

### Different options for threshold exemptions used in section 6:

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. (Option 1 OR 2): Companies with annual consumption up to [X] GWh/year in a deliverable 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. (Option 1 AND 2): 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.

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

Select only one:

- 1 - No Support
- 2 - Little Support
- 3 - Neutral
- 4 - General Support
- **5 - Fully Support**

154. Please provide your reasons for support, if any.

Select all that apply:

- A. 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
- B. Encourages organizations under a threshold to continue to engage in voluntary procurement using an annual procurement approach
- C. Provides a more equitable approach for reporting as hourly matching could be more challenging for organizations under a threshold
- D. Reduces transition strain on the electricity market and hourly matching infrastructure
- **E. Other (please provide)**

155. Please provide any additional comments regarding your reasons for support.

We do not support mandatory hourly matching.

In the event that mandatory hourly matching moves forward, exemptions are necessary in order to preserve momentum in clean energy development. This is primarily due to the fact that hourly matching is not feasible for many load structures, regions, and administrative processes.

That being said, we propose making hourly matching optional, rather than mandatory with exemptions. Making hourly matching optional with a viable consequential option in parallel allows for two feasible options in which comparability can be preserved. Making hourly matching mandatory with exemptions, thresholds, a legacy clause, etc. adds complexity and weakens the ability for organizations to compare their MBM results to one another.

156. Please provide your concerns or reasons for why you are not supporting, if any.

Select all that apply:

- Reduces accuracy and relevance of MBM reporting
- Introduces inconsistencies across companies, reducing transparency and comparability for users
- Creates reputational risk and increases skepticism about MBM claims
- Fragments the voluntary market and may slow the transition to wider availability/use of hourly data
- Feasibility is better addressed via temporary measures (e.g., phase-ins/legacy) rather than ongoing exemptions
- Tools and infrastructure are improving rapidly, making broad exemptions increasingly unnecessary
- Support an exemption, but a different criterion should be used for defining eligibility
- Other (please provide)

Blank

157. Please provide any additional comments regarding your concerns or reasons for why you are not supporting.

Blank

158. What evidence and/or reasoned rationale supports the need for exemptions (e.g., data access, costs, feasibility)?

For many reporting entities, hourly matching not only misaligns with their values (if they are focused on impact of procurement not attempts at usage claims) and/or is infeasible for them for all the reasons previously discussed. As such, given that we believe hourly matching should be a "may" and not a "shall", in the event it is a "shall" we believe more exemptions are better as the result is a mandate for hourly matching that applies to the fewest reporting entities.

159. 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

a. Over 165 GWh, per deliverable market boundary

160. If you provided a different threshold amount in (a), how does your proposed threshold better fit the intent of the exemption (reducing reporting burden while maintaining MBM integrity and impact)? How would this exemption threshold impact the administrative and cost burden of the proposed MBM requirements compared to an exemption threshold of 5, 10, or 50 GWh per deliverable market boundary?

To reiterate our points - we think hourly matching should be a "may" not a "shall". However, if it continues to be a shall we would recommend a threshold above 165GWh. The reasoning for that being:

Hourly matching should only be required of entities who have a viable option to pursue such goal through PPA procurement - to avoid forcing entities that would otherwise have utilized a PPA strategy to instead rely upon unbundled spot RECs. That would require the buyer to sign at least two PPAs of different technologies (example: one wind and one solar in order to "smooth" the aggregate generation towards matching with load). Under the assumptions of 1) a ~37.5% net capacity factor (wind is often higher, solar is often lower), 2) <25MW PPAs are hard to source from utility-scale projects due to transaction costs and credit concerns, then the minimum should be:  $25\text{MW} * 8,760 \text{ hrs/yr} * 0.375 \text{ NCF} * 2 \text{ PPAs} = 164,250\text{MWh}$ . As such, we propose a 165GWh exemption, because below that point we don't believe it's viable at scale to pursue hourly matching through a long term PPA strategy (noting there may be significant variations based on region, etc., but this is intended to provide a general scale).

161. 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:

- A. Number of employees
- **B. Net annual turnover**
- **C. Balance sheet**

- **D. Emissions (scope 1 + LBM scope 2)**
- E. Company location (high and upper-middle income countries and low- and lower-middle income countries)
- F. Other (please explain)

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

Blank

163. 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.

Select only one:

- Option 1
- Option 2
- **Option 3**
- Option 4
- None of the above (please explain)

164. If you selected "None of the above" in question 163, please describe your preferred eligibility conditions to apply an exemption to hourly matching and outline how this reflects a reasonable balance of integrity, impact and feasibility of the MBM.

Blank

165. Please provide additional comments regarding your answer to question 164, including the main reasons why it is the most appropriate and any geographic or industry specific considerations that influenced your response.

Blank

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

Select only one:

- A. Time-limited (i.e. phased out over time)
- **B. Ongoing**
- C. Unsure
- D. Do not support exemptions

167. 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).

Blank

168. 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?

Blank

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

Select only one:

- **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
- Unsure
- Other (please explain)

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

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## Section 7: Legacy clause considerations

171. 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)?

Select only one:

- 1 - No Support
- 2 - Little Support
- 3 - Neutral
- 4 - General Support
- **5 - Fully Support**

172. 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)

173. Please provide any additional comments regarding your reasons for support.

First: If hourly matching is optional, as we would strongly recommend, there is no need for a legacy clause.

However: If hourly matching becomes mandatory: a legacy clause is absolutely necessary. At a fundamental level, we do not believe reporting entities should be punished for being early adopters of Scope 2 rules since their enactment in 2015. In addition, the absence of a legacy clause or its time out would send a signal to voluntary clean energy buyers that these rules could change again in the future, negating their investments. This would have an additional chilling effect to voluntary procurement (above and beyond the chilling effect already expected if hourly and location matching is required and there is not a viable alternative in Impact Accounting)

174. Please provide your concerns or reasons for why you are not supporting, if any.

Select all that apply:

- Reduces overall accuracy and relevance of MBM reporting
- Introduces inconsistencies across companies, reducing transparency and comparability for users
- Not aligned with MBM's purpose, weakens credible market signals and abatement planning, and may conflict with regulatory expectations
- Creates reputational risk and increases skepticism about MBM claims
- Fragments the voluntary market and may slow the transition to wider availability/use of hourly data
- Other

Blank

175. Please provide any additional comments regarding your concerns or reasons for why you are not supporting.

Blank

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

Select only one:

- **Contract signed prior to implementation date of the Scope 2 Standard (post phase-in period)**
- Contract signed prior to publication date of the Scope 2 Standard
- Other (please explain)
- Do not support Legacy Clause

177. Please provide any additional comments regarding your response to question 176.

Blank

178. 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.

1. 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.
2. Duration of legacy treatment: Specify the time limit or maximum remaining term after which updated Scope 2 Quality Criteria apply to all contracts.
3. Allocation rules to prevent legacy contractual instruments being used to target the most challenging hours or locations.
4. Transfers and resale requirements when legacy instruments are sold or transferred to third parties.
5. 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).
6. 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).
7. 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).
8. Global equity: Approaches to address regional concentration of eligible contracts and related equity considerations.

The legacy clause should be long enough to ensure that previous commitments to voluntary procurement remain valid, including long-term PPAs.

179. Does a legacy clause pose material implications for users of climate-related financial risk disclosure programs?

Select only one:

- 1 - No implications
- 2 - Minimal implications
- 3 - moderate implications
- 4 - many implications
- 5 - Significant implications

Blank

180. Please briefly explain your rating: identify what the potential impacts could be and the main factors driving the impact (for example, comparability, transparency etc.).

Blank

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

Select only one:

- **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. Include a separate disclosure that disaggregates results affected by contracts signed prior to this date.
- Other (please specify)

182. If you selected "Other" in question 181 please provide details of an alternative transition approach that better balances continuity and comparability for the scope 2 MBM whilst maintaining integrity impact and feasibility.

Blank

183. 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?

Blank



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# Consequential Electricity-Sector Emissions Impacts Survey

## General Feedback

18. What potential benefits, challenges, or unintended consequences do you foresee with developing and using consequential accounting methods for electricity-sector actions? Please include any practical considerations (e.g., feasibility, data needs, costs, comparability, clarity of claims).

## **BENEFITS:**

The only way to measure impact.

- Attributional inventories, including LBM and MBM, do not measure impact. Their purpose is to accurately account for usage, as stated by GHGP (June 2025).

Send the right investment signal to the market.

- Decision-useful data to guide procurement choices for the most impactful projects by accounting for the emissions impact of electricity projects. As the GHGP noted, a solar project in Georgia or Poland on a carbon-intensive grid would displace more emissions than one deployed in California or Spain on a cleaner grid.

- This data guides buyers to projects with the greatest emissions impact, providing long-term offtake agreements for impactful projects and sending an investment signal to generate projects where they have the highest emissions impact. Collectively, this accelerates grid decarbonization.

Growing feasibility.

- As the GHGP already noted, a broad and growing base of data is available for build and operating margin from ISOs and other organizations.

Accuracy: most accurate view into system changes.

- Consequential accounting captures grid realities (i.e. impact on the grid from changes in generation or consumption) and assesses the marginal impact of a decision to increase or decrease consumption at a specific time and place.

Cost effective / lowers electricity costs overall.

- McKinsey article: impact accounting lowered electricity costs for users

- Consequential accounting does not rely on deliverability boundaries, opening investment to high impact but lower cost regions, including potential to drive \$85B into emerging markets by 2040.

## **CHALLENGES:**

- Need inclusion of emissions caused by consumption alongside emissions avoided by procurement - An absolute number for avoided emissions is meaningless without comparing it to emissions caused by consumption.

- Need to require consequential accounting alongside inventories - otherwise it risks sitting on the shelf.

- Additionality requirement - If it is too stringent, it will deter investment in impactful projects. Need to strike a balance to achieve a reasonable requirement.

Relevant resources used for our answer attached below:

[1] ZEROgrid Performance Metric Principles, [https://zerogrid.org/wp-content/uploads/dlm\\_uploads/2025/05/iai-performance-metric-principles.pdf](https://zerogrid.org/wp-content/uploads/dlm_uploads/2025/05/iai-performance-metric-principles.pdf)

[2] Paths to Carbon Neutrality: A Comparison of Strategies for Tackling Corporate Scope II Carbon Emissions, [https://tcr-us.com/uploads/3/5/9/1/35917440/paths\\_to\\_carbon\\_neutrality\\_white\\_paper\\_april23.pdf](https://tcr-us.com/uploads/3/5/9/1/35917440/paths_to_carbon_neutrality_white_paper_april23.pdf)

[3] Rethinking your company's clean-power strategy, <https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/rethinking-your-companys-clean-power-strategy>

[4] Implications of a carbon-matching approach and its potential for accelerating grid decarbonization, [https://3degreesinc.com/insights/carbon-matching-report/?utm\\_source=linkedin&utm\\_medium=social&utm\\_campaign=organic\\_social](https://3degreesinc.com/insights/carbon-matching-report/?utm_source=linkedin&utm_medium=social&utm_campaign=organic_social)

[5] GHGP June Blog, <https://ghgprotocol.org/blog/scope-2-technical-working-group-progress-update>

[6] TWG meeting minutes: 74% of TWG votes to advance consequential accounting, <https://ghgprotocol.org/sites/default/files/2025-07/S2-Meeting16-Minutes-20250625.pdf>

## Formula for quantifying emissions impacts from electricity projects

This section introduces equations used to quantify consequential emissions impacts from electricity procurement, as a first step toward an emissions impact methodology. It briefly summarizes formulas in existing GHG Protocol guidance and presents the Scope 2 TWG subgroup's proposed equation, then seeks feedback on its structure (e.g., primary vs. secondary effects, reporting period).

19. Referencing Section 6.1 in the Consequential Electricity-Sector Emissions Impacts document, is the proposed Scope 2 TWG subgroup formula appropriate for quantifying emissions impacts from electricity projects?

Please refer to the structure of the formula itself, and save comments on methodological details, such as marginal emission rates or eligibility requirements, for following sections of the survey.

Select only one:

- Yes
- No

20. Please explain your answer to question 19

We appreciate the progress made on the consequential metric using marginal emissions rates. However, the formula as provided does not achieve what is needed for Impact Accounting to be useful to reporting entities. This is primarily because it is currently only applicable to emissions avoided by procurement, and does not calculate or allow emissions caused by consumption. The ability to calculate emissions caused AND avoided is a pre-requisite for the impact accounting option to have any material utility for reporting entities. [1],[2]

It should also be noted that it is my understanding that this formula does not represent what the TWG consequential subgroup proposed, which includes emissions from consumption.[3]

[1] WattTime: Accounting for Impact, <https://watttime.org/wp-content/uploads/2023/12/WattTime-AccountingForImpact-202209-vFinal2.pdf>

[2] RE-Source: Carbon Matching, [https://www.emissionsfirst.com/\\_files/ugd/820a9e\\_23bdd35c3c65419a9501ceaf32ccd40.pdf](https://www.emissionsfirst.com/_files/ugd/820a9e_23bdd35c3c65419a9501ceaf32ccd40.pdf)

[3] Public Statement from Members of the GHG Protocol Scope 2 TWG Consequential Subgroup, November 2025, <https://marginalimpactmethod.org/>

21. Should the quantification of emissions impacts from electricity projects consider secondary effects in addition to primary effects?

Select only one:

- Yes
- **No**

22. If you answered “yes” to question 21, please provide additional context for what kinds of secondary effects should be considered, and how these may be quantified.

Blank

23. If you answered “no” to question 21, please provide additional explanation for why secondary effects should not be considered.

The formula should focus on primary effects only.

24. Should the emissions impacts of electricity projects be calculated and reported each reporting year, or should the emissions impacts for the entire lifetime of a project be reported once at the outset of the project?

Select only one:

- **Reported each year**
- Reported once for the lifetime of the project

25. Please explain your answer to question 24

Emissions impacts should be reported annually for alignment with and consistency between other annual reporting methods (LBM, MBM Inventory).

Further, the scientific integrity of this method will be improved if this metric changes over time as the grid evolves (becomes more/less clean, improves transmission, etc.) rather than relying on a one-time forecast which has a high degree of uncertainty and risks gamesmanship in the forecasting methodology.

## Treatment of Additionality

This section introduces approaches for assessing additionality, the principle that claimed emission reductions or avoided emissions must result from actions that would not have occurred otherwise. It summarizes common tests used in existing programs and seeks feedback on which approaches are most appropriate, feasible, and rigorous for future GHG Protocol guidance. This input will help the AMI TWG refine additionality criteria as part of its continued work on avoided-emissions accounting, consistent with ISB direction.

26. For each of the provided additionality tests, indicate which tests should be included (required or optional) in a framework designed to assess additionality for renewable energy projects?

For these questions, "required" indicates a mandatory test, such that all projects must pass the test in question to be eligible. "Optional" indicates that a test can be used to demonstrate additionality, but is not mandatory. For optional tests, projects have the choice for which tests they use to demonstrate additionality.

	Required	Optional	Not required
Regulatory test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Timing test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Financial analysis test	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Barrier Test	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Common practice test	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Positive list	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Performance standard	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Contractual / tenor test	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
First-of-its-kind test	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

27. For the additionality tests you selected as required or optional, please provide commentary detailing why each should be included.

What we recommend is that additionality is defined by a Regulatory Test, a Timing Test and either a Positive List test OR a Financial Test. We understand this is what the consequential Technical Working Group also recommended (and was supported by a significant majority of the full Scope 2 Technical Working Group). [1], [2]

It is worth noting that the language used for these tests should be revised to have measurable, objective definitions. For example, the use of the word "planned" in the Timing Test is subjective and could lead to confusion, as well as an incorrect application of the test. The Timing Test should instead use a defined metric like COD, not the ambiguous determination of a "planned" project.

Similar to the definition of deliverability for a Market-Based Inventory method, there is no way to "prove" additionality and, we believe that the scientific integrity of the definition of additionality in the 45V green hydrogen tax credit definitions fell short for additionality as it did for deliverability.

We believe that by using a regulatory test and a timing test, projects defined as "additional" will avoid obvious false positives. Beyond those requirements, the addition of either a positive test OR a financial test would allow a filter for non-obvious false positives, while still maintaining the feasibility of implementation.

Beyond these 4 tests (both of Regulatory and Timing and one of Positive or Financial), the other tests, in our opinion, fail to meet the thresholds for either or both: 1) scientific integrity and/or 2) feasibility.

[1] Appendix to Public Statement from Members of the GHG Protocol Scope 2 TWG Consequential Subgroup, November 2025, [https://marginalimpactmethod.org/Appendix\\_Table.pdf](https://marginalimpactmethod.org/Appendix_Table.pdf)

[2] GHG Protocol Scope 2 TWG Meeting Minutes, Meeting number 16, June 25, 2025.

28. For each of the provided additionality tests, please indicate which tests are feasible to implement.

Select all that apply:

- **A. Regulatory test**
- **B. Timing test**
- **C. Financial analysis test**
- D. Barrier test
- E. Common practice test
- **F. Positive list**
- G. Performance standard
- H. Contractual/tenor test
- I. First-of-its-kind test

- J. None (no tests are feasible)

29. Please provide additional context or information on which tests are or are not feasible to implement.

Tests A, B, C, and F are feasible options for additionality - see answer to Q#27

30. Please list any additionality tests not already included here that should be considered as part of an additionality framework for renewable energy projects. Please explain why each test should be considered.

Blank

31. Should regional differences be considered in additionality tests (e.g. different combinations of additionality tests would be relevant or appropriate for different regions)?

Select only one:

- Yes
- **No**
- Unsure, depends on details

32. If you answered "yes" to question 31, please explain your answer, referencing specific examples of regions that warrant different kinds of tests.

I answered "b. No" to question 31, but I'd like to provide some context.

A 3-step "additionality" test (Regulatory, Timing and Positive list OR Financial) is already a material feasibility burden for reporting entities. Having one or more of these tests change with every region that a reporting entity operates in would significantly degrade the feasibility to an unviable level. Regional differences should be inherently captured within the additionality tests themselves.

33. Should the level of rigor in additionality tests be applied differently depending on the type of claim an organization wants to make? (e.g. association vs. causal claim)

Select only one:

- Yes
- **No**

34. If you answered "yes" to question 33, please explain, citing the kinds of claims organizations should be able to make given different approaches to additionality tests.

Blank

## Marginal Emission Rates

This section introduces approaches for determining marginal emission rates, the emission factors that represent how changes in electricity generation or consumption affect grid emissions. It outlines existing methodologies for both operating and build margin calculations and requests feedback on which approaches are most appropriate, credible, and feasible to use in avoided-emissions accounting. This input will inform the AMI TWG's continued development of consistent, sector-agnostic methods in line with ISB direction.

35. Which methodology or methodologies are appropriate for quantifying the operating margin emissions impacts of renewable energy projects?

Select all that apply.

- **A. SCED – fuel on the margin**
- **B. SCED – locational**
- C. Scenario modeling
- D. Heat-rate/LMP
- **E. Statistical**
- F. Capacity factor based
- G. Difference-based
- H. None

36. Which methodology or methodologies for quantifying the operating margin emissions impacts of renewable energy projects are not appropriate?

Select all that apply:

- A. SCED – fuel on the margin
- B. SCED – locational
- **C. Scenario modeling**
- **D. Heat-rate/LMP**
- E. Statistical
- **F. Capacity factor based**
- **G. Difference-based**
- H. None

37. Please provide any additional explanations or further details regarding which operating margin methodologies are or are not appropriate.

Our preferred waterfall for operating margin methodologies is b. SCED - locational, a. SCED - fuel on the margin, then e. Statistical. These models are most accurate for the following reasons:

- Observable data: Using observed data, rather than model, allows for increased accuracy within the model. We align with suggestions from the ZeroGrid Impact Advisory Initiative, which specify the need for a standardized approach with observable data in order to limit confusion and manipulation [1]. Methods that are purpose-built to leverage data from system operators are generally considered significantly more accurate for estimating the immediate operational impacts of actions [3].

- Use of Marginal Emissions Rates: According to research, marginal emissions rates provide the highest level of precision, as average emissions rates introduce inaccuracies. Ex. from the VERACI-T group: "We evaluate multiple prevalent existing MEF models and find that both dispatch and statistical MEF models have a high degree of agreement with the benchmark MEF, while heat rate and average emissions do not." [2]

- Attention to transmission congestion: Locational SCED models generate highly granular marginal emissions rates, measured at a specific location, which is key for measuring impacts of congestion. In a recent study conducted by Johns Hopkins University and REsurety, marginal emission rate estimates were calculated using a nodal dispatch model (similar to a locational SCED simulation) for ERCOT, based on marginal generator data and nodal LMP, were validated in a study comparing marginal emissions datasets, in which it was found to be the most accurate dataset. [3]

- Simpler to use: For improved feasibility, we agree with ZeroGrid IAI's view that the model should also be simpler to use. Models requiring individual inputs risk modifying the model, and has the potential to "improperly inflate the estimated impact of their actions" [1]

[1] ZEROgrid's Impact Advisory Initiative's Performance Metric Principles , [https://zerogrid.org/wp-content/uploads/dlm\\_uploads/2025/05/iai-performance-metric-principles.pdf](https://zerogrid.org/wp-content/uploads/dlm_uploads/2025/05/iai-performance-metric-principles.pdf)

[2] Validating locational marginal emissions models with wind generation , <https://iopscience.iop.org/article/10.1088/2753-3751/ad72f6/pdf>

[3] Sofia, Sarah, and Yury Dvorkin. "Carbon Impact of Intra-Regional Transmission Congestion." Cell Reports Sustainability, <https://www.cell.com/action/showPdf?pii=S2949-7906%2825%2900273-3>

38. Which methodology or methodologies are appropriate for quantifying the build margin emissions impacts of renewable energy projects?

Select all that apply.

- **Recent capacity additions**
- Policy scenario
- Capacity expansion modeling

- Average emission rate
- None

39. Which methodology or methodologies for quantifying the build margin emissions impacts of renewable energy projects are not appropriate?

Select all that apply.

- Recent capacity additions
- **Policy scenario**
- **Capacity expansion modeling**
- **Average emission rate**
- None

40. Please provide any additional explanations or further details regarding which build margin methodologies are or are not appropriate.

Appropriate:

Based on research, option A) Recent capacity additions is the most appropriate methodology. Using observed data, rather than modeled, allows for increased accuracy within the model. We align with suggestions from the ZeroGrid Impact Advisory Initiative, which specify the need for a standardized approach with observable data in order to limit confusion and manipulation. [1]

Not Appropriate:

Other options, like a capacity expansion model, are not appropriate for reliable and accurate emissions modeling. In capacity expansion models, the answer is highly variable as it is based on differing inputs. We again agree with the ZeroGrid Impact Advisory Initiative (IAI)'s Performance Metric Principles, which focus primarily on maximizing emissions impact from and outside of renewable procurement, and states: "Consequential assessment can be conducted using a variety of approaches, including capacity expansion models, yet these approaches are often complex, time-intensive, and subject to producing variable results based upon key inputs and assumptions." [1]

[1] ZEROgrid's Impact Advisory Initiative's Performance Metric Principles, [https://zerogrid.org/wp-content/uploads/dlm\\_uploads/2025/05/iai-performance-metric-principles.pdf](https://zerogrid.org/wp-content/uploads/dlm_uploads/2025/05/iai-performance-metric-principles.pdf)

41. How could GHG Protocol assess these models' applicability to different types of projects?

Factors that could affect applicability may include, but are not limited to, project size, shape, and capacity factor.

Blank

42. What other types of emission rates or metrics may be appropriate for assessing the emissions impacts of projects?

Blank

43. What is the maximum appropriate level of spatial granularity for marginal emission rates?

- Country
- Grid region
- Balancing area
- Zonal
- **Nodal**

44. Please provide context regarding your answer to question 43.

Hourly, nodal granularity is essential for measuring the marginal emissions impact at the generator/facility level, and capturing accurate congestion impacts. Assessing these impacts at the node allows for the highest credibility and accuracy associated with the total emissions impact claims as a result. Experts agree:

- Quantifying the impact of energy system model resolution on siting, cost, reliability, and emissions for electricity generation,

[https://www.researchgate.net/publication/383010871\\_Quantifying\\_the\\_impact\\_of\\_energy\\_system\\_model\\_resolution\\_on\\_siting\\_cost\\_reliability\\_and\\_emissions\\_for\\_electricity\\_generation](https://www.researchgate.net/publication/383010871_Quantifying_the_impact_of_energy_system_model_resolution_on_siting_cost_reliability_and_emissions_for_electricity_generation)

- ZeroGrid Expert Consensus Support for a Rigorous Definition of "Deliverability" in Scope 2 GHG Accounting, [https://zerogrid.org/wp-content/uploads/dlm\\_uploads/2025/05/iai-deliverability-memo.pdf](https://zerogrid.org/wp-content/uploads/dlm_uploads/2025/05/iai-deliverability-memo.pdf)

- Sofia, Sarah, and Yury Dvorkin. "Carbon Impact of Intra-Regional Transmission Congestion." Cell Reports Sustainability, <https://www.cell.com/action/showPdf?pii=S2949-7906%2825%2900273-3>

45. What is the maximum appropriate level of temporal granularity for marginal emission rates?

Select only one:

- Annual
- Monthly
- Daily
- **Hourly**
- Sub-hourly

46. Please provide context regarding your answer to question 45.

The most appropriate temporal granularity for emission factors is the smallest interval for which accurate data is available, and marginal emissions rates vary materially hour-to-hour due to diurnal and seasonal variations, as well as from impacts of congestion.

#### 1. Enhanced Accuracy and Alignment with Grid Operations

The core defense of hourly rates is that they accurately reflect the high frequency of changes in electricity generation and instantaneous grid dispatch. It is typically preferable to use hourly data or finer temporal granularity, as coarser data (e.g., annual) degrades the accuracy of the analysis due to diurnal and seasonal variations in marginal emissions rates.

2. Preventing Misestimation: Relying on coarse accounting methods, such as annual averages, can lead to wildly inaccurate estimates of carbon emissions, potentially over- or under-estimating emissions. This gap is expected to increase as renewables saturate the grid, making hourly measurements necessary for accurate accounting.

3. GHGP Recommendation: For the Location-Based Method (LBM) in GHG Protocol revisions, the proposed hierarchy lists hourly as the most precise temporal granularity. We agree, and suggest that the same precision apply to the consequential metric.

## Build and operating margin weights

This section addresses how to balance or weight operating margin and build margin impacts when estimating the emissions effects of electricity projects. It summarizes existing approaches used in GHG Protocol and other programs, as well as additional concepts raised by the Scope 2 TWG subgroup and seeks feedback on which weighting methods are most appropriate and practical. Responses will guide the AMI TWG in developing consistent approaches for combining

short-term and long-term grid impacts in future avoided-emissions methodologies, consistent with ISB direction.

47. Which, if any, of the included approaches for assigning build and operating margin weights for electricity projects are appropriate?

Select all that apply:

- **A. GHG Protocol Guidelines for Quantifying GHG Reductions from Grid-connected Electricity Projects**
- B. UNFCCC CDM Tool07
- **C. Default 0.50 build margin weight for all projects**
- D. Resource adequacy approaches
- E. Intervention lifecycle approaches
- F. None are appropriate
- G. Unsure

48. If you selected any of these approaches, please explain why the approach is appropriate for assigning build and operating margin weights for electricity projects.

We agree with WattTime [1] that the 50/50 weighting offers a feasible and defensible default option. This is being further researched by the VERACI-T group and we expect that additional research will be available to further defend or amend this default case prior to the GHGP's publication of the final rules in 2027.

As more research is done, it may become viable and advisable to develop a schedule of weights, where there is a different default rate based on different scenarios (region, project type, etc.) as detailed in the GHG Protocol Guidelines for Quantifying GHG Reductions from Grid-connected Electricity Projects. But it is worth noting that the pursuit of additional project-specific accuracy should be weighted against the goals of feasibility and comparability.

[1] How to use the GHG Protocol's consequential electricity emissions reporting option

<https://watttime.org/news-and-insights/how-to-use-the-ghg-protocols-optional-consequential-electricity-emissions-reporting-option/>

49. Which, if any, of the included approaches for assigning build and operating margin weights for electricity projects are not feasible to implement?

Select all that apply.

- A. GHG Protocol Guidelines for Quantifying GHG Reductions from Grid-connected Electricity Projects
- B. UNFCCC CDM Tool07
- C. Default 0.50 build margin weight for all projects
- D. Resource adequacy approaches
- E. Intervention lifecycle approaches
- **F. All are feasible**
- G. Unsure

50. If you selected any of these approaches, please explain why the approach is not feasible to implement.

The UNFCCC CDM methodology is a feasible option, but it is worth noting that it should be further researched what error is introduced when assume a default weighting of 0.75 OM/ 0.25 BM for all solar and wind projects (recommended by UNFCCC [1]), as compared to the 0.5 weighting.

The other two suggestions from the TWG (d. Resource adequacy approaches e. Intervention lifecycle approaches) could potentially be valid approaches, but we need more information about these approaches before being able to determine the feasibility of them.

[1] <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

51. Other than the approaches listed here, what approach could be used to assign build and operating margin weights for electricity projects?

Blank

52. Please provide any research or documentation to support your suggested approach.

Blank

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## Summary of Reference Materials

Source and Link	Questions Used
<a href="#">3Degrees: Carbon Matching Report</a>	Impact 18
<a href="#">ACORE Letter</a>	Inventory 75
<a href="#">Baringa: The Corporate Catalyst</a>	Inventory 87
<a href="#">Brattle Group: Expert Testimony (Spees &amp; Lam)</a>	Inventory 75, 141
<a href="#">Brattle Group: Hydrogen Tax Credits</a>	Inventory 82
<a href="#">Case Study: Caught in the Middle</a>	Inventory 18, 87, 96, 141
<a href="#">CEBA Calls for Immediate Changes</a>	Inventory 75, 133
<a href="#">CEBA Report: Corporate Demand Drives Clean Energy</a>	Inventory 18, 141
<a href="#">EnergyTag: Scope 2 Guidebook</a>	Inventory 99
<a href="#">Ever.Green: Hourly Matching FAQ</a>	Inventory 75
<a href="#">Expert Consensus on Carbon Impact</a>	Inventory 18
<a href="#">FERC Order 888</a>	Inventory 18
<a href="#">GHG Management Institute: Hourly Matching</a>	Inventory 75
<a href="#">GHGP Blog: Scope 2 Update</a>	Impact 18
<a href="#">GHGP TWG Meeting Minutes</a>	Impact 18, 27
<a href="#">Johns Hopkins: Deliverability (SSRN)</a>	Inventory 87
<a href="#">Marginal Impact Method: Appendix</a>	Impact 27
<a href="#">McKinsey: Rethinking Clean Power</a>	Impact 18
<a href="#">Princeton: 24/7 CFE Costs</a>	Inventory 82, 141
<a href="#">Quantifying the impact of energy system model resolution</a>	Impact 44
<a href="#">RE-Source: Carbon Matching</a>	Impact 20
<a href="#">RFF: Corporate GHG Reporting</a>	Inventory 75
<a href="#">RFF: What We're Actually Talking About</a>	Inventory 18

<a href="#">Six things wrong with the GHGP's proposals</a>	Inventory 20, 75
<a href="#">TCR: Cost and Emissions Impact</a>	Inventory 82, 96, 133, 141
<a href="#">TCR: Paths to Carbon Neutrality</a>	Impact 18
<a href="#">TWG Proposal / Marginal Impact Method</a>	Inventory 133, 148; Impact 20
<a href="#">UNFCCC CDM Tool07</a>	Impact 50
<a href="#">Validating locational marginal emissions models</a>	Impact 37
<a href="#">WattTime: Accounting for Impact</a>	Impact 20
<a href="#">WattTime: Evaluating the Impacts (SSRN)</a>	Inventory 82, 96
<a href="#">WattTime: How to use consequential option</a>	Impact 48
<a href="#">ZeroGrid: Deliverability Memo</a>	Inventory 75, 87, 89; Impact 44
<a href="#">ZeroGrid: Performance Metric Principles</a>	Impact 18, 37, 40
<a href="#">ZeroGrid: Review of Research</a>	Inventory 96

