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Scope 2 Technical Working Group Meeting

Meeting #3: Options To Improve The Location-Based Method

November 26, 2024

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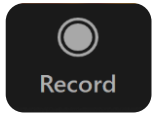
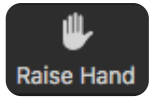
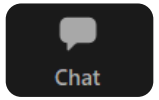


This meeting is recorded.



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



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

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

Be mindful of sharing group discussion time; keep comments as succinct as possible.

Agenda

- Welcome
- Goal and structure of today's discussion
- Current purposes of the location-based method
- Secretariat assessment of proposed options
- Option A: Current methodology for calculating the location-based method
- Options B & C: Proposed options for improving the location-based method
- Next steps

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Goal and structure of today's discussion

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Goals of today's meeting

1. Hear TWG members' perspectives on revisions to improve to the location-based method
2. Begin process for conceptualizing what a revised location-based method looks like based on TWG consensus
3. Identify initial TWG ideas, road-blocks and questions for ISB awareness

Note: We will reassess any necessary changes to the required reporting methods (i.e., the meeting #2 topics) after consideration of all technical improvements to the location- and market-based methods.

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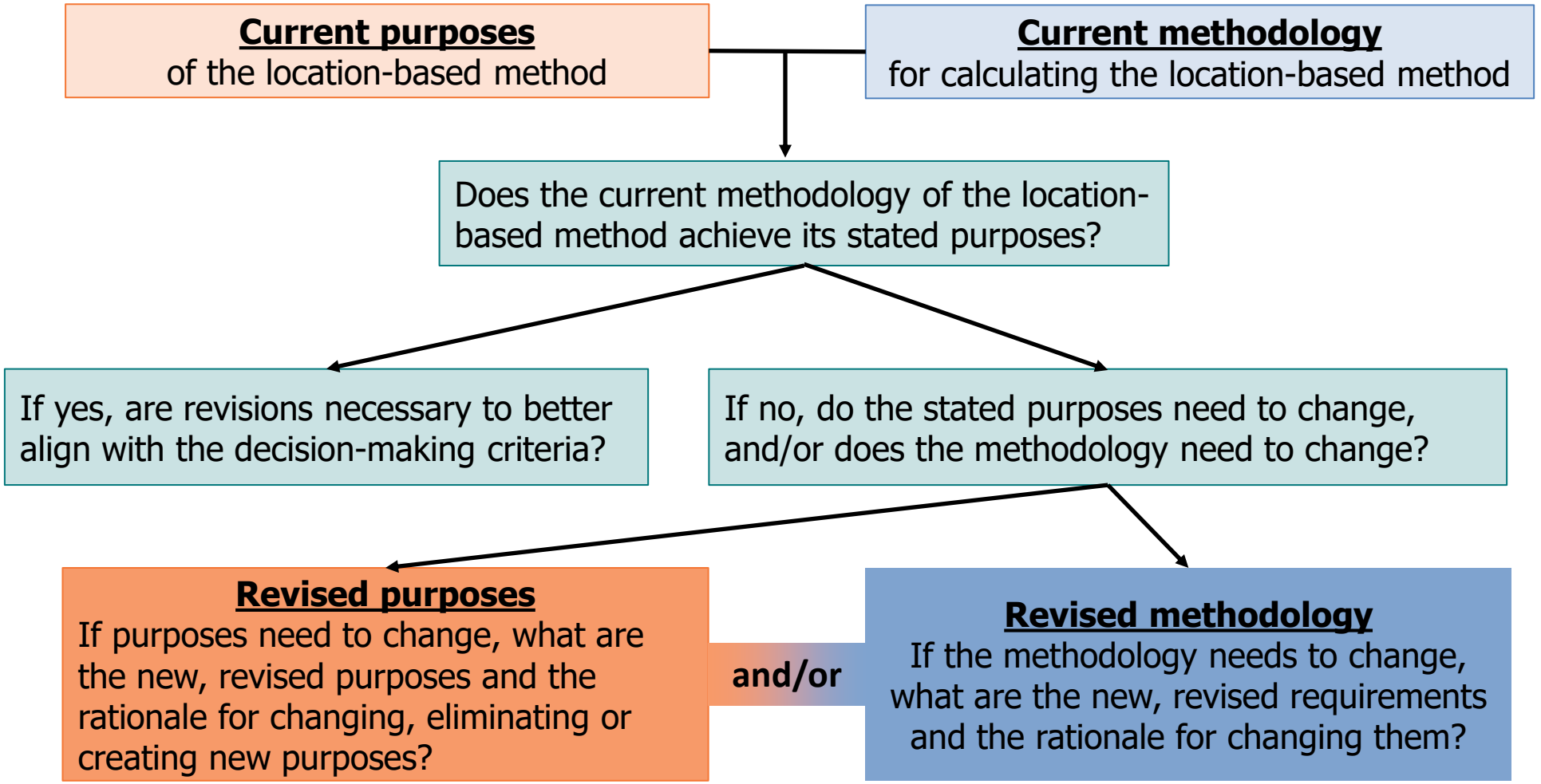
Evaluating proposed options for improving the location-based method and considering alignment with purposes



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Matrix for categorizing feedback on how to make revisions

During the meeting, TWG members are encouraged to use the below matrix as a reference for categorizing the nature of their feedback on how to revise the location-based method and rationale for doing so.

The *what:*	The *how:*
Keep current purposes	**Keep current methodology**
Revise purposes	**Revise methodology**

Current purposes, usefulness, and decision-making value of the location-based method

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Definition of the location-based method within the scope 2 inventory

Scope 2 inventory definition:

- Corporate Standard: "Electricity indirect GHG emissions - Scope 2 accounts for GHG emissions from the generation of purchased electricity consumed by the company. Purchased electricity is defined as electricity that is purchased or otherwise brought into the organizational boundary of the company. Scope 2 emissions physically occur at the facility where electricity is generated."[1]

- Scope 2 Guidance: "Scope 2 is an indirect emission category that includes GHG emissions from the generation of purchased or acquired electricity, steam, heat, or cooling consumed by the reporting company."[2]

Location-based method definition:

- "A method to quantify scope 2 GHG emissions based on average energy generation emission factors for defined geographic locations, including local, subnational, or national boundaries." [3]
- "The location-based method is based on statistical emissions information and electricity output aggregated and averaged within a defined geographic boundary and during a defined time period." [4]

[1] *Corporate Standard, Chapter 4, p. 25*
[2] *Scope 2 Guidance, section 5.3, p. 34*
[3] *Scope 2 Guidance, Table 4.1, p. 26*
[4] *Scope 2 Guidance, section 4.1.1, p. 25*

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What is the purpose of the location-based method?

The Secretariat aggregated all text related to the method's purposes, recommended uses and decision-making value, which is summarized by the following categories:

1. Estimating and reflecting emissions based on grid data

2. Risk and opportunity assessment related to grid emissions

3. Enabling decision-making for consumers and companies

4. Improving comparability

These purposes were assessed within the context of the GHG Protocol Decision-Making Criteria

Please see section Discussion Paper Section 4. *Technical Improvements: Location-Based Method* for a comprehensive evaluation of uses described in the Scope 2 Guidance.

Secretariat assessment of proposed options

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Presentation of information

- 35 members completed the survey by the due date.
- Each option is presented showing both the initial Secretariat assessment along with TWG's initial degree of consensus and alternative perspectives.
- Further analysis is included in the supplementary information detail for criterion with a wider range of perspectives.

Secretariat assessment: Option B mostly improves the location-based method's alignment with the decision-making criteria

		Option A: Maintain the Current Location-Based Method Accounting and Reporting Requirements	Option B: Refine Reporting Requirements for the Location-Based Method to Require Temporal and Geographic Granularity	Option C: Revise Location-Based Method Emission Factor Hierarchy to Include Power Flow Modeling
Scientific integrity		Mixed	Mixed / Yes	*Further discussion with TWG needed.*
Corporate Standard GHG accounting and reporting principles	**Relevance**	Mixed	Mixed / Yes	
	Completeness	Yes	Yes	
	Consistency	Yes	Yes	
	Transparency	Yes	Mixed / Yes	
	Accuracy	Mixed	Mixed / Yes	
	Comparability	Mixed	Mixed / Yes	
Supports decision making that drives ambitious global climate action		Mixed / No	Mixed	
Supports programs based on GHG Protocol and uses of GHG data		Mixed	Mixed / Yes	
Feasibility to implement		Yes	Mixed / No	

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Secretariat initial observations

- Option B aligns better with decision-making criteria when assessing current purposes but faces feasibility challenges.
- Recommendations, rather than requirements, to use more granular temporal and geographic data could help organizations improve relevance and accuracy when feasible.
- Evaluating the trade-offs between *recommending* and *requiring* elements of Option B should be considered by the TWG, as a recommendation without a requirement may not demonstrate greater overall alignment with decision-making criteria when applied by organizations globally.

Option A: Current methodology and requirements for the location-based method

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Option A: Maintain the current location-based method accounting and reporting requirements

Maintain current broad flexibility of the scope 2 location-based method emission factor hierarchy

- Companies **should** use the most appropriate, accurate, precise, and highest quality emission factors available for each method. [5]
- Organizations **should** first try to use regional or subnational emission factors
- When such information is unavailable, organizations **may** use national production emission factors

Maintain broad temporal requirements

- An annual grid average emission factor is described as an indicative example for an appropriate regional or subnational emission factor.
- When analyzing location-based scope 2 results, organizations are encouraged to take into account "temporal representativeness due to time delays between the year in which energy generation and resulting emissions occurred, and the year in which the data is published." [6]

Table 6.2 Location-based method emission factor hierarchy

Data forms listed here should convey combustion-only (direct) GHG emission rates, expressed in metric tons per MWh or kWh.

Emission factors	Indicative examples
Regional or subnational emission factors *Average emission factors representing all electricity production occurring in a defined grid distribution region that approximates a geographically precise energy distribution and use area. Emission factors **should** reflect net physical energy imports/exports across the grid boundary.*	eGRID total output emission rates (U.S.)[a] Defra annual grid average emission factor (U.K.)[b]
National production emission factors *Average emission factors representing all electricity production information from geographic boundaries that are not necessarily related to dispatch region, such as state or national borders. No adjustment for physical energy imports or exports, not representative of energy consumption area.*	IEA national electricity emission factors[c]

Notes:

a Although eGRID output rates represent a production boundary, in many regions this approximates a consumption or delivery boundary, as eGRID regions are drawn to minimize energy imports/exports. See: http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html.

b See Defra: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/224437/pb13988-emission-factor-methodology-130719.pdf.

c IEA emisison factors do not adjust for imports/exports of energy across national boundaries. See: http://data.iea.org/ieastore/product.asp?dept_id=101&pf_id=304.

Scope 2 Guidance, p. 47

[5] *Scope 2 Guidance, section 6.5, p. 45*

[6] *Scope 2 Guidance, section 6.10.1, p. 54*

Currently optional: Reporting advanced or real-time estimations

- Where advanced studies (or real-time information) are available, companies **may** optionally report scope 2 estimations using this data separately as a comparison to location-based grid average estimations, and companies can document where this data specifically informed efficiency decision making or time-of-day operations.[7]

- Because these studies or analyses may be more difficult to use widely across facilities or to standardize/aggregate consistently without double counting, companies **should** ensure that any data used for this purpose has addressed data sourcing and boundaries consistent with the location-based method.[8]

Box 6.2 Advanced grid studies

Companies may have access to detailed studies or software solutions linking their facility's time-of-day energy use patterns to the GHG emissions from local generation dispatching during those times. This emission data could be compiled over the course of a year for a consumer to record, match against temporal usage by location, and calculate scope 2 emissions. To date such studies or analyses have not been widely available or used, and have often been contained in proprietary databases with limited consumer access. However, the root components of this type of GHG emissions data, including facility-specific generation and emissions information, are becoming increasingly common as smart grid applications and distributed generation grow. This data can help inform specific demand-side actions more than grid-average emission factors, which may only incentivize overall demand reduction rather than targeted actions. For instance, while utilities may implement DSM measures in order to mitigate emissions, those consumers' demand-timing choices have not been commonly linked to that consumer's GHG emissions, even as those choices may be linked to pricing.

Scope 2 Guidance, p. 53

[7] *Scope 2 Guidance, section 6.10, p. 53*
[8] *Scope 2 Guidance, section 7.3, p. 61-62*

TWG feedback on Option A assessment

Secretariat assessment

		Option A: Maintain the Current Location-Based Method Accounting and Reporting Requirements
Scientific integrity		Mixed
Corporate Standard GHG accounting and reporting principles	**Relevance**	Mixed
	Completeness	Yes
	Consistency	Yes
	Transparency	Yes
	Accuracy	Mixed
	Comparability	Mixed
Supports decision making that drives ambitious global climate action		Mixed / No
Supports programs based on GHG Protocol and uses of GHG data		Mixed
Feasibility to implement		Yes

TWG Member Assessment

TWG Majority Assessment	**TWG Alternative Assessments (ranked by count)**			
Mixed (25/35)	Mixed / No (8)	No (2)		
Mixed (31/35)	No (3)	Mixed / No (1)		
Yes (31/35)	Mixed / Yes (3)	No (1)		
Yes (32/35)	Mixed (3)			
Yes (25/35)	Mixed / Yes (5)	Mixed (5)		
Mixed (24/35)	Mixed / No (8)	No (2)	Mixed / Yes (1)	
Mixed (29/35)	Mixed / No (3)	Mixed / Yes (2)	Yes (1)	
Mixed / No (28/35)	No (5)	Mixed (2)		
Mixed (33/35)	Mixed / No (1)	Mixed / Yes (1)		
Yes (33/35)	Mixed / Yes (2)			

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Option A discussion questions

- What, if any, of the *current purposes* need to change with the current location-based method?
  1. Estimating and reflecting emissions based on grid data
  2. Risk and opportunity assessment related to grid emissions
  3. Enabling decision-making for consumers and companies
  4. Improving comparability
- Are there other purposes that should be listed?

- What, if any, *methodology or calculation requirements* need to change with the current location-based method?

Matrix for categorizing feedback:

Keep current purposes	**Keep current methodology**
Revise purposes	**Revise methodology**

Please see section Discussion Paper Section 4. *Technical Improvements: Location-Based Method* for a comprehensive evaluation of uses described in the Scope 2 Guidance.

Options B & C: Location-based technical improvements under consideration

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Option B: Refine reporting requirements for the location-based method to require temporal and geographic granularity

Organizations **shall** account and report their location-based method inventory using more temporally and geographically granular accounting and reporting requirements for the location-based method.

- Organizations **shall** account for and report the location-based method inventory using hourly grid average emission factors and activity data.
- Organizations **shall** account for and report the location-based method inventory using emission factors that reflect 'deliverable' geographic boundaries.

In this option 'deliverable' geographic boundaries are considered in two ways:

a. Deliverable boundaries shall use granular geographic boundaries (to be discussed and defined in TWG consultation).
b. Deliverable boundaries shall use grid-average emission factors that include energy imports/exports across grid boundaries.

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Option B. Refine Reporting Requirements for the Location-Based Method to Require Temporal and Geographic Granularity

Secretariat assessment

		Option B: Refine Reporting Requirements for the Location-Based Method to Require Temporal and Geographic Granularity
Scientific integrity		Mixed / Yes
Corporate Standard GHG accounting and reporting principles	Relevance	Mixed / Yes
	Completeness	Yes
	Consistency	Yes
	Transparency	Mixed / Yes
	Accuracy	Mixed / Yes
	Comparability	Mixed / Yes
Supports decision making that drives ambitious global climate action		Mixed
Supports programs based on GHG Protocol and uses of GHG data		Mixed / Yes
Feasibility to implement		Mixed / No

TWG Member Assessment

TWG Majority Assessment	TWG Alternative Assessments (ranked by count)			
Mixed / Yes (27)	Mixed / No (3)	Yes (3)	Mixed (2)	
Mixed / Yes (25)	Mixed (4)	Yes (3)	Mixed / No (2)	No (1)
Yes (32)	Mixed / Yes (1)	Mixed (1)	No (1)	
Yes (29)	Mixed / Yes (2)	Mixed (2)	Mixed / No (2)	
Mixed / Yes (29)	Mixed (4)	Yes (2)		
Mixed / Yes (26)	Yes (4)	Mixed (2)	Mixed / No (2)	No (1)
Mixed / Yes (29)	Mixed (6)			
Mixed (23)	Mixed / Yes (6)	Mixed / No (4)	No (1)	Yes (1)
Mixed / Yes (27)	Mixed (6)	No (1)	Yes (1)	
Mixed / No (20)	Mixed (8)	No (5)	Mixed / Yes (2)	

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Option B discussion questions

- What, if any, of the current *purposes* need to change to align with Option B?
  1. Estimating and reflecting emissions based on grid data
  2. Risk and opportunity assessment related to grid emissions
  3. Enabling decision-making for consumers and companies
  4. Improving comparability
- Are there other purposes that should be listed?

- What *methodology or calculation requirements* need to change with Option B?
  - Is a one-hour period the most appropriate temporal granularity?
  - How can market boundary or 'deliverability' be defined in the context of Option B?
  - What data exists that can assess the feasibility of Option B?

Matrix for categorizing feedback:

Keep current purposes	**Keep current methodology**
Revise purposes	**Revise methodology**

Option C: Use Power Flow Modelling in Location-Based Method

- Update the location-based method to include emission factors from 'power flow modelling' as the most precise option in the emission factor hierarchy.
- This could also involve changes to reporting for "advanced grid studies."

'Power flow models' consider detailed characteristics of the underlying power network including the topology (transmission lines locations and properties, generators details, etc.) and physical constraints.

- Some feedback proposed that inaccuracies with the current location-based method are compounded by the assumption that power is uniformly mixed within a given grid region which ignores the actual physics of how power flows on individual transmission corridors.
- Various approaches have been developed to calculate emissions by applying power flow tracing techniques to trace carbon emissions through transmission networks from source to consumption.

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Option C. Revise Location-Based Method Emission Factor Hierarchy to Include Power Flow Modeling

Secretariat assessment

		Option C: Revise Location-Based Method Emission Factor Hierarchy to Include Power Flow Modeling
Scientific integrity		*Further discussion with TWG needed.*
Corporate Standard GHG accounting and reporting principles	**Relevance**	
	Completeness	
	Consistency	
	Transparency	
	Accuracy	
	Comparability	
Supports decision making that drives ambitious global climate action		
Supports programs based on GHG Protocol and uses of GHG data		
Feasibility to implement		

TWG Member Feedback

- Some unclear about power flow modelling approach.
- Some unsupportive due to misalignment with decision-making hierarchy.
- Some supportive of it being considered in the context of A & B or as an advanced, optional method.
- Some mixed, highlighting the increased accuracy of these approaches but noting challenges with them meeting the purposes of the LBM.

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Option C Discussion Questions

- How should Option C be considered in the context of the location-based methodology specifically and scope 2 accounting and reporting generally?

- How does Option C relate to Box 6.2 (p. 53) on advanced grid studies within the Scope 2 Guidance?

Next steps

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Next steps

Developing revisions to the location-based method

- TWG members should begin development of initial revisions to the location-based method
- TWG members are encouraged to work in groups to develop proposed changes
- Further discussion on location- and market-based method redlines and supporting analysis to be addressed at next meeting

Next meeting(s)

- Overview of proposed revisions to the market-based method will be discussed across 2 meetings on back-to-back days
  - December 17th and 18th, 9-11 EST
  - Discussion paper on the market-based method will be provided tomorrow, November 27th
  - Survey #3 on the market-based method **due Thursday, December 5th at 5pm EST***

**Note that the survey due date has moved up by 1 business day from what was shared in the kick-off meeting to facilitate the Secretariat's required turnaround time to process results.*

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Supplementary Material

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Shall, Should, May to be used in developing revised Standards

- GHG Protocol standards use precise language to indicate which provisions of the standard are requirements, which are recommendations, and which are permissible or allowable options that companies may choose to follow.
  - "**Shall**" indicates what is required to be in conformance with the standard.
  - "**Should**" indicates a recommendation, but not a requirement.
  - "**May**" indicates an option that is permissible or allowable.

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GHG Protocol Decision-Making Criteria

1A. Scientific integrity	1B. GHG accounting and reporting principles	2A. Support decision making that drives ambitious global climate action	2B. Support programs based on GHG Protocol and uses of GHG data	3. Feasibility to implement
Ensure scientific integrity and validity, adhere to the best applicable science and evidence … and align with the latest climate science.	Meet the GHG Protocol accounting and reporting principles of accuracy, completeness, consistency, relevance, and transparency. Additional principles should be considered where relevant: conservativeness (for GHG reductions and removals), permanence (for removals), and comparability (TBD). …	Advance the public interest by informing and supporting decision making that drives ambitious actions by private and public sector actors to reduce GHG emissions and increase removals in line with global climate goals. …	Promote interoperability with key mandatory and voluntary climate disclosure and target setting programs … while ensuring policy neutrality. Approaches should support appropriate uses of the resulting GHG data and associated information by various audiences …	Approaches which meet the above criteria should be feasible to implement, meaning that they are accessible, adoptable, and equitable. … For aspects that are difficult to implement, GHG Protocol should aim to improve feasibility, for example, by providing guidance and tools to support implementation.

Note: This is a summary version. For further details, refer to the full decision-making criteria included in the annex to the Governance Overview, available at https://ghgprotocol.org/our-governance.

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Current purposes of the location-based method (1/2)

1. Estimating and reflecting emissions based on grid data

- Providing a method of estimating allocating GHG emissions caused by electricity generation to the end consumers of a given grid that can apply in all locations.[8]
- Reflecting GHG intensity of grids where operations occur, regardless of market type.[9]
- Reflecting that a consumer is served by all the energy resources deployed on their regional grid.[10]
- Reflecting the role of "balancing" resources and their emissions. [11]

2. Risk and opportunity assessment related to grid emissions

- Showing risks/opportunities that are better evaluated based on average emissions in a grid (e.g., regulatory). [12]
- Reflecting risks related to grid operation and maintenance (e.g., maintaining regional grid reliability). [13]
- Highlighting a company's exposure to geographic risks, including (a) air pollution such as sulfur dioxide (SOx) or mercury from coal combustion; (b) the impact of hydropower on local waterways and aquatic life; and (c) the risks from nuclear waste disposal or emergencies. [14]

[8] *Scope 2 Guidance, section 4.1 and 4.1.1, p. 25*
[9] *Scope 2 Guidance, Table 4.1, p. 26*
[10] *Scope 2 Guidance, section 2.5, p. 19*
[11] *Scope 2 Guidance, Box 4.1, p. 27*
[12] *Scope 2 Guidance, section 6.4.1, p. 45*
[13] *Scope 2 Guidance, section 2.2, p. 16-17*
[14] *Scope 2 Guidance, section 2.2, p. 17*

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Current purposes of the location-based method (2/2)

3. Enabling decision-making for consumers and companies [15]

A. Facility and operations-siting decisions
- Enabling facility-siting decisions based on carbon intensities of standard grid-delivered electricity in different regions.
- Enabling facility-siting decisions based on natural features of a location (e.g., areas with low-carbon natural resources, or additional benefits such as natural ambient cooling or heat).

B. Decisions on the level and timing of demand
- Highlighting opportunities for reduced energy consumption.

C. Decisions to influence grid mix of generation technologies
- Reflecting the cumulative effect of consumer or supplier choices over time that change the grid-average emission factor.

4. Improving comparability
- Improving comparability across a reporting organization's operations across multiple markets over time. [16]
- Comparing the aggregate GHG performance of energy-intensive sectors (e.g., comparing electric train transportation with gasoline or diesel vehicle transit). [17]

[15] *Summarized from Scope 2 Guidance, section 4.3, p. 28-31*
[16] *Scope 2 Guidance, section 6.4.1, p. 45*
[17] *Scope 2 Guidance, Table 4.1, p. 26*

Option A. Criterion for discussion: Scientific integrity

Decision-making criterion	Secretariat assessment	NA	No (does not align)	Mixed/no	Mixed	Mixed/yes	Yes (align)
Scientific integrity	**Mixed**	**0**	**2**	**8**	**25**	**0**	**0**

Reasons for **lower ratings**

- Evaluation in discussion paper shows less alignment with criteria than mixed
- The inaccuracies addressed in paper will increase over time
- Scientific Integrity for Scope 2 should align with goal of ambitious climate action; which average emissions may not be effective in achieving
- Scientific Integrity for Scope 2 should be based on the integrity of purchasing decisions; best served by MB accounting
- Attributional accounting isn't designed for causality; the scientific integrity of this method shouldn't be assessed against this purpose or use.

Option A. Criterion for discussion: Transparency

Decision-making criterion	Secretariat assessment	NA	No (does not align)	Mixed/no	Mixed	Mixed/yes	Yes (align)
Transparency	**Yes**	**0**	**0**	**0**	**5**	**5**	**25**

Reasons for **lower ratings**

- Multiple interpretations of Transparency Principles
- Location-based emissions factors lack public transparency in sources, methodology, and assumptions
- Need for clarification on sufficiently accurate datasets for different geographies
- Should be assessed lower than Option B; more granularity is needed for transparency
- The location-based method isn't relevant to Scope 2 definition so cannot address all relevant issues

Option A. Criterion for discussion: Accuracy

Decision-making criterion	Secretariat assessment	NA	No (does not align)	Mixed/no	Mixed	Mixed/yes	Yes (align)
Accuracy	**Mixed**	**0**	**2**	**8**	**24**	**1**	**0**

Reasons for **lower ratings**

- Annual average emission factor isn't accurate due to grid variation
- Inaccuracies addressed in the discussion paper will increase over time
- Unclear what metric of accuracy the criteria is measuring against
- The location-based method doesn't accurately measure emissions for purchased electricity per Scope 2 definition

Reasons for **higher ratings**

- Accuracy depends on the types of claims the inventory results support. Can support a claim that the results are the share of system electricity emissions attributed to an end user.

Option B. Criterion for discussion: Relevance

Decision-making criterion	Secretariat assessment	NA	No (does not align)	Mixed/no	Mixed	Mixed/yes	Yes (align)
Relevance	**Mixed / Yes**	**0**	**1**	**2**	**4**	**25**	**3**

Reasons for **lower ratings**

- No clear improvement over Option A
- Relevance only increases if consumption data and emission factors are based on the same periods
- Limited usage of increased granularity impacts method's relevance as a benchmark
- Little evidence that granular average emission data supports decision-making

Reasons for **higher ratings**

- Better reflects company's GHG emissions and aids internal decision-making
- Increased granularity improves decisions on reducing true location-based footprint. Shouldn't be assessed against making market-based method decisions or reducing consequential emissions.

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Option B. Criterion for discussion: Supports global climate action and goals

Decision-making criterion	Secretariat assessment	NA	No (does not align)	Mixed/no	Mixed	Mixed/yes	Yes (align)
Supports global climate action and goals	**Mixed**	**0**	**1**	**4**	**23**	**6**	**1**

Reasons for **lower ratings**

- Only rates higher than Option A if consumption data and emission factors are based on the same periods
- The location-based method leads to reliance on grid decarbonization instead of immediate action
- Still fundamental issues in using average emission factors to inform climate action

Reasons for **higher ratings**

- Awareness of peak loads/emissions on an hourly basis can support more ambitious climate action
- Sends a market signal to develop clean, firm power technologies
- Attributional methods are not designed to inform abatement decisions but are useful for setting reduction targets aligned with global budgets, aiding climate action.

Option B. Criterion for discussion: Feasibility

Decision-making criterion	Secretariat assessment	NA	No (does not align)	Mixed/no	Mixed	Mixed/yes	Yes (align)
Feasibility	**Mixed / No**	**0**	**5**	**20**	**8**	**2**	**0**

Reasons for **lower ratings**

- Lack of data in less mature markets
- Concerns of confusion with deliverability concept unless GHGP defines boundaries
- Current state of storage technologies and load profiles complicate GHG reporting in some regions

Reasons for **higher ratings**

- Hourly data is available for many regions and can be expanded globally
- Load profiles can be used where hourly data isn't available
- A hierarchy could be implemented that allows monthly accounting if hourly data isn't available
- Could phase in granularity or split reporting requirements based on size, geography etc.