Organization

Emissions First Partnership

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Proposal and supporting information

1. **Which standard or guidance does the proposal relate to (Corporate Standard, Scope 2 Guidance, Scope 3 Standard, Scope 3 Calculation Guidance, general/cross-cutting, market-based accounting approaches, or other)? If other, please specify.**

Scope 2 Guidance

2. What is the GHG accounting and reporting topic the proposal seeks to address?

This proposal seeks to address the GHG accounting and reporting topic of 'Scope 2: Electricity indirect GHG emissions'.

3. What is the potential problem(s) or limitation(s) of the current standard or guidance which necessitates this proposal?

The current GHG Protocol Scope 2 Guidance has helped drive over one hundred gigawatts of voluntary clean energy investment, but has not kept up with the increasing focus of many corporations in addressing decarbonization goals through a range of interventions, or the rapidly improving quality of emissions data. As a result, the guidance in its current form does not adequately measure the true emissions impacts of a company's actions or incentivize more targeted emissions reduction activities. The two areas in which the current Scope 2 guidance is most problematic are:

1) Assuming all MWhs within a given reporting year and market boundary [or other such appropriate term] have the same emissions reduction/avoidance impact.
2) Limiting action to certain geographies based on physical load volumes.

Problem 1: Using MWh as a Metric for Netting Emissions to Zero

The current Scope 2 Guidance does not account for the potentially material differences in grid emissions between the location and time of clean electricity generation and electricity consumption.

The following two examples highlight the need for updating the current guidance to shift the focus of renewable energy accounting from energy consumption to quantified emissions.

> **Example 1 (Location Matters):** Under the current protocol, a business that consumes electricity in Wyoming can sign a Power Purchase Agreement (PPA) in Texas to offset their energy consumption. If the volume of energy procured in Texas equals the amount consumed in Wyoming, the business can claim to have fully eliminated its carbon footprint when, in reality, due to significant differences in the carbon intensity of the grids between geographies and based on time of consumption, the company will likely still have a meaningful unaddressed emissions footprint.
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> **Example 2 (Time Matters)**: Under the current protocol, a business that consumes the majority of their electricity during the day can report a market-based emissions total of zero by purchasing an equal number of MWh of renewable electricity from a local wind project in the same market that produces most of its electricity at night. The emissions impact of electricity consumption and generation differ throughout the day, even in the same market, and therefore should be accounted for as separate emissions totals within the same equation.

As can be seen in the examples above, the current methodology creates several issues from its use of MWh as its fundamental unit of accounting rather than CO2e. First, using MWh as the basis of the accounting system prevents the effects of time and location from being accounted for. This is true for both the emissions created from load and the emissions avoided by renewable energy projects, load

shifting, and/or responsible use of energy storage. As a result, many companies have a less precise measurement of their electricity emissions footprint than would be preferred.

Second, the way that the current guidance is laid out, corporations have less incentive to invest in clean energy where it is more acutely needed. In the first example, buying a PPA in a region with a more carbon intensive grid (such as New Mexico or West Virginia) would be more impactful than in Texas, because Texas is more saturated with renewables and thus the marginal emissions benefit of Energy Attribute Certificates (EACs) purchased in this region are lower. In the current guidance there is no structure in place to encourage companies to target buying EACs in areas that lead to more emissions impact.

Finally, the current methodology encourages companies to buy renewable energy without consideration of the project's carbon impact against other projects or actions. This can cause an oversaturation of renewables in certain markets (e.g. California or Texas), which at times results in a new renewable energy plant simply replacing the output of another renewable plant with less than desired net incremental emissions reduction, as well as an underinvestment in markets with more carbon intensive grids that more acutely need renewables (e.g. West Virginia, Kentucky, New Mexico). There is no recognition in the GHG Protocol's accounting framework that recognizes the balance between the supply and demand for renewables across geographies to maximize impact.

The Scope 2 Guidance should develop accounting guidance that moves beyond the current approach of MWh matching, and focuses on the heart of the matter: **emissions impact**. It is important to update the accounting standards for corporate emissions to make the accounting more accurate, align with how electricity markets operate, take advantage of modern data and increased data availability, and ensure clean energy investments that maximize electricity decarbonization.

Problem 2: Market Boundary Limitations

All CO2e emissions, regardless of geography, equally impact the Earth's atmosphere. Currently, the market boundary criteria (7.5 Criteria 5) in the guidance limits the potential for maximum decarbonization impact by requiring that all instruments "be sourced from the same market in which the reporting entity's electricity-consuming operations are located. This impedes the opportunity for accelerated development of renewables in more carbon-intensive grids where they are most needed and the decarbonisation of the world's electricity system.

For example, if a company that consumes electricity in the USA wishes to bring their Scope 2 emissions to zero, it would need to do so with EACs sourced from within the existing interconnected grid boundaries. While there is still a need for additional renewable energy procurement in the US, generally speaking, many states have ramping Renewable Portfolio Standards and decarbonization targets in the coming years. Additionally, the cost to build and operate a new renewable energy plant may be quite high, for the relative emissions it displaces. If the goal is to drive down global emissions as fast and cost-effectively as possible, corporations who are voluntarily seeking to take action should be allowed to do so wherever the emissions reduction will be most impactful (in terms of $/mtCO2e avoided) and not to be constrained to regions where these reductions are happening already.

Meanwhile, many countries, such as India and South Africa for example, have highly carbon-intensive electricity grids (637 and 716 gCO2e/kWh respectively[1]), that would greatly benefit from more

[1] "Carbon Intensity of Electricity, 2022" Our World In Data.
https://ourworldindata.org/grapher/carbon-intensity-electricity

renewable energy project deployments. Companies with operations outside of these countries are not currently motivated to purchase renewable energy in these regions because current Scope 2 guidance does not allow them to apply the renewable energy attributes to their inventory. If the current guidance were to allow companies to source EACs in the most carbon intensive grids, regardless of geographic location, it would provide an incentive to significantly expand the investment in renewables in markets where it has long been needed most. Additionally, it is difficult to incent private capital to develop projects in these locations because the risk/return is not currently favorable. Adding a third dimension of emissions (on top of dollars and MWh), enables this incentive.

4. **Describe the proposed change(s) or additional guidance.**

In the face of growing emissions rate variability and improved data which allows more sophisticated decision making, the importance of empowering electricity users to make decisions that maximize grid emissions reduction impact is critical to have a trajectory that aligns with the global 1.5 deg C scenario.

Objectives for new Scope 2 guidance

Scope 2 Guidance should evolve to more accurately measure decarbonization actions and thereby:

- Give electricity users, and their stakeholders, the **most accurate view of the emissions impact of electricity** use possible. This will in turn allow electricity users to **make clear, high impact, demand-side GHG emission reduction decisions** in their businesses (e.g., operating on cleaner electric grids, investing in energy efficiency, electric load shifting, optimizing the dispatch of electric vehicle fleets). Eventually this will result in a scalable, flexible, and future-proof framework that rewards emissions reduction progress across geographies, intervention technologies, and size of company.
- Give clean energy buyers the **best data possible to maximize the emissions reduction impact** of their investments – prioritizing action where and when it matters most. This includes the ability to incorporate future advancements in available emissions data and measurements.
- Give stakeholders **confidence that emission reduction claims made by organizations are accurate and impactful**, which would ideally incent a full suite of corporate actions across load management and procurement to effectively address emissions.

Accounting Principles

The Emissions First Partnership lays out the following electricity emissions accounting principles to drive climate action:

Prioritize Decarbonization

1. Recognize that the emissions impact of a megawatt-hour of electricity consumption or generation varies based on time and location. Move accounting beyond megawatt-hour matching to focus on the quantified emissions impact of each activity.
2. Take a global view recognizing that all GHG emissions impact the atmosphere and value clean energy procurement targeted to locations with maximum decarbonization impact irrespective of grid or market boundaries.

Value Grid Decarbonization Progress

3. Ensure that corporate clean energy procurement and utility-supplied clean energy are both quantified and incorporated in accounting systems.

Incentivize Innovation in the Emissions Data Ecosystem

4. Accommodate and favor continual improvements in data quality and availability.
5. Maintain the integrity and accuracy of the underlying emissions accounting data by embracing transparency and third party verification.

Accounting Governance

6. As data and measurement complexity increases, ensure all organizations can continue accounting for and reporting on electricity emissions to their stakeholders.
7. Avoid penalizing clean energy procurement and planning already made by buyers under the current guidance through methodology changes that could disqualify, or significantly devalue, these projects and investments.

8. Ensure guidance is applicable to real world scenarios by providing fair and consistent accounting treatment for all clean electricity technologies in addition to renewable energy procurement.

Proposal

Based on these principles, the Emissions First Partnership proposes the following changes to the current Scope 2 Guidance.

The framework should evolve from today's guidance, which gives 100% emissions credit for any clean energy purchases regardless of where and when power is generated[2] ("Average Annual Basis"), to one that allows for, and ideally incentivizes, an emissions-first calculation for both electricity consumption and generation, using the best available locational and temporal granularity.

Additionally, this more refined emissions calculation should be done separately for electricity consumed and renewable energy purchased/generated, with the emissions totals (mtCO2e) netted against each other, instead of assuming that all clean MWhs purchased offset MWhs consumed equally. This will ensure that renewable energy projects resulting in the most cost-effective ($ spent per mtCO2e avoided) are incentivized.

Emissions First Electricity Emissions Accounting

The general formula for calculating corporate Scope 2 market-based emissions under this proposal is:

$$induced\ electricity\ GHG\ Emissions\ -\ avoided\ GHG\ emissions\ =\ Scope\ 2\ emissions$$

For RE purchases in reduction activities => $RECs_{RE\ project} * EF_{RE\ project} = GHG\ reductions$

This Scope 2 formula answers the questions:

1) what were the GHG emissions from serving my load, and

2) what emissions did my contracted renewable energy or purchased EACs displace?

The following tables propose data hierarchies for Load consumption data, Load emission factors, Renewable energy generation data (backed by EACs/RECs), RE project emission factors, etc..

Calculating Load Emissions

Formula for calculating emissions from load when hourly load data is available:

$$\sum_{facility=1}^{i} \sum_{hour\ t=1}^{8760} (MWh\ load_{i,t} * EF_{i,t})$$

Formula for calculating emissions from load when only monthly, quarterly, or annual load data is available:

$$\sum_{facility=1}^{i} (MWh\ load_{i} * EFavg_{i})$$

1. Electricity Consumption Data Hierarchy (load MWh)

Time Period	Data Type	Description and Notes
Hourly	Data from utility billing-grade meter(s)	Best practice: include hourly usage reports in utility special agreements, landlord lease contracts
	Data from non-utility metering equipment (e.g. landlord submetered data)	Users should collect information on data from non-utility meters to ensure quality is sufficient
Monthly, Quarterly, or Annually	Data from utility billing-grade meter(s)	Data sources include utility invoices.
	Data from non-utility metering equipment	Example: submetered electricity usage, reported by landlord to tenant.

2. Load GHG Emission Factor Data Hierarchy

Calculation Time Period	Emission Factor Type	Description/ & Notes	Current Examples
Hourly	Marginal Emission Factor from same electric grid	Electric grid boundaries could be balancing authorities for the US	electricityMap US EIA – national data (regional data expected)
Monthly, Quarterly, or Annually	Utility-specific Emission Factor	In current Scope 2 Guidance emission factor hierarchy	EEI Utility CO2 Emission Factor Database
	Grid Residual Emission Factor		PJM, NYISO, NEPOOL , green-e residual data
	Location-based Grid Emission Factor		eGRID

<u>Calculating GHG Reduction Project Avoided Emissions</u>

Note: guidance in this draft is limited to renewable energy project emissions quantification, but additional guidance is needed for accounting for emissions reductions from contracted energy storage projects.

Formula for calculating emissions avoided from renewable energy projects when hourly renewable energy generation data from a specific project is available:

$$\sum_{project\ ID=1}^{j} \sum_{hour\ t=1}^{8760} (RE\ generation(MWh)_{j,t} * EF_{j,t})$$

Formula for calculating displaced emissions from renewable energy when only annual renewable energy generation data is available:

$$\sum_{project\ ID=1}^{j} (RE\ generation\ (MWh)_{j} * EFmarginal_{j})$$

3. Renewable Energy Generation Data Hierarchy

Time Period	Generation Data Type	Examples
Hourly (or subhourly)	Generation data from a specific project / known generation point	Generation data, backed by RECs, from VPPAs or green tariffs
Monthly, Quarterly, or Annually	Generation data from a specific project / known generation point	Generation data, backed RECs, from VPPAs or green tariffs
	Generation data where the specific generating project is unknown. Need to know electric grid (e.g. PJM, ERCOT).	Unbundled RECs

The Renewable Energy Generation Data hierarchy assumes that the reporting company has title, and has retired, environmental attributes from these generation sources (e.g. RECs or GOs). Companies need the environmental attributes to make claims on their contracted renewable generation in Scope 2 inventories.

Hourly REC availability is currently limited, but through the EnergyTag stakeholder process the availability of hourly RECs is expected to grow (e.g. PJM plans to offer hourly RECs[26]). The proposed data hierarchy **does not** require that a project generate hourly RECs in order to use hourly generation. Instead, if a company has annual (or quarterly) RECs from a project that meet the *impactful procurement quality criteria* (see below) then the Company can use the associated hourly generation from the underlying asset (if known and available) in its Scope 2 calculation.

4. Renewable Energy Project Emission Factors

Calculation Time Period	Emission Factor Type	Description & Notes	Current Examples
Hourly (or subhourly)	Marginal Emission Factor at same location of project (node)	Addressed in recent Infrastructure bill EIA language.	Resurety
	Marginal Emission Factor from same electric grid		WattTime, PJM, CAISO.
Monthly, Quarterly, or Annually	Avoided Emission Rates by RE generator technology, region	Available by region, project type, by year	https://www.epa.gov/avert/avoided-emission-rates-generated-avert UNFCCC marginal emission rates by country
	Location-based (average) Grid Emission Factor		eGRID

[2] "PJM to offer time matched renewable energy certificates as demand for 24/7 coverage grows" Utility Dive. https://www.utilitydive.com/news/pjm-to-offer-time-matched-renewable-energy-certificates-as-demand-for-247/643135/

Matching Time Periods

Scope 2 emissions are calculated by multiplying electricity data (MWh) by the appropriate emission factor (mt CO2e/MWh). As a result, the time period of the electricity data and the emission factor need to match. For example, it doesn't make sense to multiply hourly renewable energy generation data when only annual emission factors are available for a given project. When evaluating the data hierarchies by data type, users should consider the types of data available for the other part of the calculation (electricity or emission factor data) when selecting the appropriate level in the hierarchy. Where high quality emissions data exists on a more granular time scale than consumption data, it would be acceptable to average the consumption over each time step or apply an appropriate load shape estimate for the facility.

Increased Disclosure of the Calculations

Scope 2 should also require the disclosure of the time horizon (hourly, annual, etc) as well as the type of emissions factor used (marginal, eGrid, etc). If multiple methods are used, there should be a disaggregation of the calculations. This will serve to both educate users as to the methods and effectiveness of the emissions reduction efforts and to incent companies to use more effective reduction methods.

How This Approach Can Align with Other Impactful Accounting Methods

The Emissions First methodology creates a versatile platform where companies can use various strategies to meet their goals. Due to its focus on emissions impact, the Emissions First methodology simply sets up the guard rails for companies to execute their emissions calculations however they wish, while still effectively reducing their emissions to meet their targets.

The decision to limit RE procurement to a load balancing authority, and to match the time of contracted carbon-free energy to a company's load, for example, is one such strategy companies may use to drive specific policy goals. A company that chooses to pursue this approach, can still use the methodological revisions proposed here. See below for a detailed explanation on how the Emissions First methodology can be used in conjunction with an hourly matching system.

Recall from the approach above that:

$$\text{GHG Emissions} = \sum_{facility=1}^{i} \sum_{hour\ t=1}^{8760} (MWh\ load_{i,t} * EF_{i,t}) - \sum_{project\ ID=1}^{j} \sum_{hour\ t=1}^{8760} (RE\ generation(MWh)_{j,t} * EF_{j,t})$$

If a company assigns a RE project to a facility in the same balancing authority, the equation simplifies to:

$$\text{GHG Emissions} = \sum_{balancing\ authority=1}^{i} \sum_{hour\ t=1}^{8760} ((MWh\ load_{i,t} * EF_{i,t}) - (RE\ generation(MWh)_{i,t} * EF_{i,t}))$$

If the same emission factor, both in type and source[3], is used to calculate load emissions and RE project displaced emissions (e.g. average or marginal emission factors from a grid operator) the equation further simplifies to:

$$\text{GHG Emissions} = \sum_{balancing\ authority=1}^{i} \sum_{hour\ t=1}^{8760} (MWh\ load_{i,t} - RE\ generation(MWh)_{i,t}) * EF_{i,t}$$

This is just one example of how the Emissions First methodology can accommodate a multitude of different emissions reduction calculations. An impact-focused approach to Scope 2 accounting like Emissions First can enable many RE strategies that companies may use, thereby expanding the opportunities for companies to meet their goals.

Transition Period for Impact-Based Accounting

While the Emissions First Partnership recognizes the value of dual reporting, as the standards evolve from the current market-based method to our proposed impact-focused version, we also recognize that there will likely be a need for a transition period in which companies have the option to use more than two methods for reporting or some other method of orderly transition. There are two important reasons for this.

First, there will be a necessary period of time while companies transition from purchasing EACs based on calculated energy generation to the quantified emissions impact of that energy consumption. Companies have spent significant time and resources in setting up their respective systems to calculate the required renewables needed to meet their targets. It will therefore take time to transition these systems to quantified emissions-focused calculations in order to make purchasing decisions to meet their Scope 2 targets.

Secondly, the transition period will be necessary for companies who have purchased PPAs and other long-term renewable contracts. These companies played a leading role in the expansion of voluntary renewable energy projects on the assumption that they were effectively reducing their emissions to meet their company targets. Without a transition period where companies can apply the existing market-based methodology to long-term existing contracts, these companies will view the transition to the new impact-focused reporting method as a penalty, despite being leaders and huge investors in the voluntary renewables market. Thus, long-term purchase contracts that were executed before the Scope 2 guidance revision should be applied to the existing market-based methodology.

It is important to note that the evolution of switching from calculating based on energy consumption to quantified emissions impact may not have a significant impact on many of these companies' renewables purchasing decisions. In many cases, this will be a marginal difference that will more accurately capture emissions impact without significantly changing the decisions that companies make when purchasing EACs. In fact, this new method could even favor those companies who consume energy in cleaner grid areas than the areas in which they purchase EACs. By focusing on quantified emissions impact, this new methodology has the additional benefit of incenting investment and operations into grids that are clean and already reducing their emissions intensities.

[3] We expect the same emissions factor to be used for both generation and load if a) Both load and generation are at the same location, and b) Geographical resolution not sufficient, e.g. if both on the same grid and specific nodal emissions data not available, necessitating an approximation.

Validating and Not Penalizing Past Voluntary Purchasers

As mentioned above, while it is important to improve the existing Scope 2 accounting guidance to incentivize climate action, it is also important not to unfairly penalize the companies who have played a leading role in the expansion of voluntary renewable energy projects through long-term PPAs and other procurement methods over the last decade. The updated guidance and corresponding transition period guidance should take this into account and ensure that past voluntary purchasers are not inadvertently penalized.

Increased Cadence for Guidance Updates

Finally, given that the existing rules will likely be approximately ten years old when updated, it is important the framework provides the flexibility to allow for new developments. This framework should be a dynamic accounting system that can evolve along with the evolving renewables landscape. The Emissions First Partnership recommends a more frequent cadence of reviewing every few years and collecting feedback to ensure the protocol is staying up to date. This would incorporate the evolving and improving data, regulatory and technology landscape and therefore can provide accurate emissions measurement and inform more impactful decision making. The more frequent this update cadence becomes, the easier and more efficient the update process will be as well.

5. Please explain how the proposal aligns with the GHG Protocol decision-making criteria and hierarchy (A, B, C, D below), while providing justification/evidence where possible.

A. GHG Protocol accounting and reporting approaches shall meet the GHG Protocol accounting and reporting principles (see Annex for definitions):

- Accuracy, Completeness, Consistency, Relevance, Transparency
- Additional principles for land sector activities and CO_2 removals: Conservativeness, Permanence, and Comparability if relevant

This proposal improves accuracy, completeness, consistency, relevance, and transparency of the current Scope 2 accounting guidance.

Accuracy - Tracking and reducing based on emissions rather than energy consumption is a more accurate way for a company to measure the emissions related to its energy consumption and the emissions avoidance related to direct actions taken by the company. This is because using data that accounts for the time and location of emissions from the grid will result in a more accurate calculation of emissions impact and effective reduction, and therefore will help companies more effectively reduce their emissions and contribute to decarbonization of electricity grids.

Completeness - Calculating the emissions of load and generation supply (of any EAC type) separately will result in an overall more complete assessment of a company's net Scope 2 emissions. See “Proposal” section to our response to Question 4 for more details.

Consistency - This proposal is a scalable solution. As the energy grid continues to evolve and become more clean, it will increasingly become more important for EACs to be tracked based on emissions rather than electricity volume to reduce a company’s emissions. Emissions-first calculation and accounting is a more consistent method that will be accurate and repeatable over time for all companies, because a tonne of greenhouse gas emissions is a much more consistent metric than an assumed quantity of uniform emissions tied to the generation of a MWh of electricity. This will be

increasingly important as the adoption of renewables will result in very different emissions footprints in different areas.

Additionally, using emissions-based accounting in Scope 2 of the GHG Protocol sets up the ability to consistently track emissions across other emissions scope accounting as well as other markets. Every supplier's Scope 2 emissions will appear in someone else's Scope 3, so it is important to harmonize on the best singular metric. Adding emissions based accounting to the GHGP is itself an important action for setting up emissions-based accounting consistently across different markets. Without this type of accounting in the GHG Protocol, implementation would be slower, less standardized, and piecemeal.

Relevance - Accounting for emissions from electricity with a common metric that is based on emissions will be more relevant to external stakeholders and consumers of a company's GHG inventory.

Transparency - Switching to an emission-based calculation using increased granularity to more accurately calculate reduced emissions creates more transparency in the true emissions associated with both the electricity use and the avoided emissions of renewable electricity generation.

B. GHG Protocol accounting and reporting approaches shall align with the latest climate science and global climate goals (i.e., keeping global warming below 1.5°C). To support this objective (non-exhaustive list):

- Direct emissions reported in a company's inventory should correspond to emissions to the atmosphere. Reductions in direct emissions reported in a company's inventory should correspond to reductions in emissions to the atmosphere.
- Indirect emissions reported in a company's inventory should in the aggregate correspond to emissions to the atmosphere. Reductions in indirect emissions reported in a company's inventory should in the aggregate correspond to reductions in emissions to the atmosphere.

This proposal improves the current accounting structure and the changes will better reflect actual carbon emissions associated with a company's activities and overall system emissions. For one, it better aligns with the latest climate science and global climate goals because it considers the quantified emissions related to a company's energy consumption rather than assuming emissions are homogeneous across both time and location. For a net zero grid, the Scope 2 emissions from all consuming entities on a grid should be zero. The framework proposed (induced emissions minus avoided emissions, see "Proposal" section of our response to Question 4 for details) is unique in that a load-consuming entity can have negative Scope 2 footprint (if avoidance > induced), but by definition others will have a positive Scope 2 footprint (induced > avoided). Regardless, the sum of all the Scope 2 footprint reported from all the consuming entities on the grid will mathematically add up to the total Scope 1 emissions of the power sector (generators). Therefore there is a direct link between the accounting framework and what is actually emitted into the atmosphere. Under the Emissions First proposal, the reporting directly ties incentive to the individual. In addition, this proposal reduces the double counting that naturally occurs when some companies get credit for purchasing renewable power but that same renewable power also reduces the overall grid average.

Principle #2 of this proposal (See "Accounting Principles" section of our response to Question 4) takes a global view recognizing that all GHG emissions impact the atmosphere, and contends that the guidance should value clean energy procurement targeted to locations with maximum decarbonization impact, irrespective of grid or market boundaries. Under the Emissions First proposal, modification of market boundary constraints allows companies to use the combined global electricity load, thus creating a larger addressable load to work from and incentivizing the purchase of clean electricity in

areas that have maximum decarbonization impact while preserving companies' abilities to continue with local procurement where that is the best decision.

C. GHG Protocol accounting frameworks should support ambitious climate goals and actions in the private and public sector.

- Would this proposal enable organizations to pursue more effective GHG mitigation/decarbonization efforts as compared to the existing standards and guidance? If so, how?
- Would this proposal better inform decision making by reporting organizations and their stakeholders (e.g. related to climate-related financial risks and other relevant information associated with GHG emissions reporting)?

The problem with the current power sector is not necessarily grid decarbonization but the RATE of grid decarbonization. To align to a 1.5deg C scenario, the power sector has to decarbonize rapidly (by 2030-2035 for a net zero grid) to allow electrification as a decarbonization pathway for 2050. Therefore with the goal of maximizing the rate of grid decarbonization, each dollar should be deployed to have maximum decarbonization impact. Without this rapid power sector decarbonization, the trajectory post 2030 becomes too steep to achieve a 1.5deg scenario. The revisions included in this proposal allow the corporate actions that have the maximum decarbonization impact while preserving companies' abilities to continue with local procurement where that is the best decision, therefore aligning more closely to a 1.5deg C scenario.

By more accurately measuring emissions through the revisions included in this proposal, the GHG Protocol would encourage behaviors that lead to the fastest, most cost effective, efficient, and ambitious emission reductions that can scale.The changes in this proposal enable companies to better focus on maximizing the impact of their clean energy initiatives and more accurately measure the avoided emissions achieved through their actions. This will in turn allow electricity users to make clear, high impact, demand-side emission reduction decisions in their businesses (e.g., operating on cleaner electric grids, investing in energy efficiency, electric load shifting, optimizing the dispatch of electric vehicle fleets).

Additionally, many important stakeholders in various industries are not familiar with electricity markets. For this reason it is important to simplify to a singular unit of emissions for reporting to create transparency and consistency. Making this more accessible to financial stakeholders will also incentivize private capital to have maximum impact.

D. GHG Protocol accounting frameworks which meet the above criteria should be feasible. (For aspects of accounting frameworks that meet the above criteria but are difficult to implement, GHG Protocol should provide additional guidance and tools to support implementation.)

- What specific information, data or calculation methods are required to implement this proposal (e.g., in the case of scope 2, data granularity, grid data, consumption data, emission information, etc.)? Would new data/methods be needed? Are current data/methods available? How would this be implemented in practice?
- Would this proposal accommodate and be accessible to all organizations globally who seek to account for and report their GHG emissions? Are there potential challenges which would need to be further addressed to implement this proposal globally? What would be the potential solutions?

For details on calculation methodology, please see “Calculating Load Emissions” and “Calculating GHG Reduction Project Avoided Emissions” sections of our response to Question 4.

Calculating the emissions method will require data on the relevant emissions factor. There is already progress being made towards making this data more widely available. There is existing grid emissions data being provided from a range of organizations (NREL, RESurety, WattTime, marginal emission factor that is averaged over that month). The choice of average and marginal emissions rates is under active discussion among industry participants. Though annual marginal emissions rates are available from the UNFCCC, more information is needed to understand how they are developed and what use cases are appropriate.

The minimum data available today can be and is being improved upon with more data available for each node on a grid and for each electricity supplier. This data is calculated through visibility into the operating plants, their capacity, and their emissions characteristics. This data is already available to grid operators, and some grid operators such as US-based PJM are already publishing this data in real time. In some areas, effort will be required to compel electricity generators and grid operators to share this data to stakeholders.

With the proliferation of this data (e.g. from grid operators, EAC registries), we expect the following developments to take place which would be complementary and supportive of an emissions based accounting method being proposed:

1. EACs are augmented with emissions related data (e.g. an avoided emissions rate and amount for each time interval and MWh). By quantifying an emissions impact, this will drive differentiated value between different EACs based on their time and location of generation. This will naturally lead to an EAC market incentivizing production at the most emission impactful times and locations. This will also mean any purchase of unbundled EACs has a clear direct emissions impact; those EACs of low emissions impact will naturally have a lower market value.
2. Focus shifts beyond procurement to incentivize a much wider array of actions. This includes load management actions, such as using storage to load shift based on emissions, optimizing EV charging to specific times or switching computational loads to different data centers in different locations.

A major advantage of the Emissions First proposed framework is that it allows flexibility for small business implementation, while allowing greater granularity for more ambitious users and incentivizing specificity where available. A small business can simplify their implementation by just using annual marginal emission factor (available through UNFCCC) and annual load. Therefore, the proposed framework is inclusive of all organizations.

6. Consistent with the hierarchy provided above, are there potential drawbacks or challenges to adopting this proposal? If so, what are they?

1. One recognized challenge is **data availability** for calculating marginal emissions impact of both grid electricity use and renewable project generation. We recognize that the availability of EACs has scaled in response to demand, and expect a similar pattern with data availability. EIA has committed to calculate marginal emissions impact of electricity and renewable project generation in the US through the US Infrastructure & Jobs Act. WattTime has committed to complete this in Europe. However, there are many regulated markets in the US, India, Japan and elsewhere in which the regulated utility needs to become more transparent. Where there are gaps in the data, a challenge will be determining how to most accurately fill those gaps with whatever is available (with the expectation that the data ecosystem will likely mature with multiple sources). Additionally, there need to be strict guidelines on hierarchies to determine how a data provider becomes an "approved source" that is recognized, and on how verification is incorporated.

2. Another challenge will be the **transition period** from the current standards to the updated standards, which involves the learning curve of companies adopting the new method as well as addressing any long-standing renewables contracts that were executed based on the old accounting method. (Please see "Transition Period for Impact-Based Accounting" section of our response to Question 4).

7. Would the proposal improve alignment with other climate disclosure rules, programs and initiatives or lead to lack of alignment? Please describe.

Our proposal of marginal emissions will likely drive more impactful emission reductions than an average annual method used today. Therefore, nothing we are proposing will negatively impact programs and initiatives that seek to reduce carbon emissions. The adoption of our proposal will also serve to educate the marketplace and regulators about the limitations of the current measurement methods and encourage more impactful corporate and governmental action.

Corporations spend significant time and effort in creating targets and measuring progress toward those targets. This measurement of progress toward targets is directly done through GHG reporting via the GHG Protocol. This is also how the wider stakeholder system views the GHG Protocol reporting. We therefore propose that the GHG Protocol aligns itself with other organizations such as CDP, SBTi, etc. If the GHG Protocol does not claim responsibility for certain areas, they need to be extremely clear about which organization will provide that guidance. This will improve alignment with other climate disclosure rules, because currently there are gaps in the guidance which no organization claims responsibility for.

It is also important to have consistency across jurisdictions to ensure there is not added complexity. The SEC in the US, UK, and Australia are creating mandatory disclosures and the GHG Protocol should be the basis of this. With this consistency, this proposal would improve alignment across jurisdictions.

8. Please attach or reference supporting evidence, research, analysis, or other information to support the proposal, including any active research or ongoing evaluations. If relevant, please also explain how the effectiveness of the proposal can be evaluated and tracked over time.

1. WattTime Whitepaper that identifies the use of MWh in emission and reduction calculations as one of the main gaps within the current GHG Protocol

2. Green Strategies Whitepaper that provides revised and additional carbon disclosure proposals to improve accuracy and relevance
3. Making It Count Whitepaper detailing the benefits of moving away from average emissions rates when calculating Scope 2 emissions
4. CEBI Carbon-free Electricity Procurement Activation Guide that defines the updates necessary to the voluntary market system to broaden the options available to customers
5. How Well Do Emission Factors Approximate Emission Changes from Electricity System Models? Alejandro G. N. Elenes, Eric Williams, Eric Hittinger, and Naga Srujana Goteti Environmental Science & Technology 2022 56 (20), 14701-14712 DOI: 10.1021/acs.est.2c02344
6. Modernizing How Electricity Buyers Account and are Recognized for Decarbonization Impact and Climate Leadership - Modernizing How Electricity Buyers Account and are Recognized for Decarbonization Impact and Climate Leadership – Clean Air Task Force (catf.us)
7. Reimagining REC Markets Integrating Additionality and Emissionality into a New Carbon-Free Paradigm - Reimagining REC Markets: Integrating Additionality and Emissionality into a New Carbon-Free Paradigm (solsystems.com)
8. Applying the consequential emissions framework for emissions-optimized decision-making for energy procurement and management, CEBI 2022, https://cebi.org/wp-content/uploads/2022/11/Applying-The-Consequential-Emissions-Framework-For-Emissions-Optimized-Decision-Making-For-Energy-Procurement-And-Management.pdf
9. Hua He, Aleksandr Rudkevich, Xindi Li, Richard Tabors, Alexander Derenchuk, Paul Centolella, Ninad Kumthekar, Chen Ling, Ira Shavel, Using marginal emission rates to optimize investment in carbon dioxide displacement technologies, The Electricity Journal, Volume 34, Issue 9, 2021, 107028, ISSN 1040-6190, https://doi.org/10.1016/j.tej.2021.107028.
10. Guide to sourcing marginal emissions factor data, CEBI 2022, https://cebi.org/wp-content/uploads/2022/11/Guide-to-Sourcing-Marginal-Emissions-Factor-Data.pdf
11. Ricks, W., Xu, Q., & Jenkins, J. D. (2023). Minimizing emissions from grid-based hydrogen production in the United States. Environmental Research Letters. http://dx.doi.org/10.1088/1748-9326/acacb5
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13. Hawkes, A. D. (2014). Long-run marginal CO2 emissions factors in national electricity systems. Applied Energy, 125, 197-205. https://doi.org/10.1016/j.apenergy.2014.03.060
14. Smith, C.N., Hittinger, E. Using marginal emission factors to improve estimates of emission benefits from appliance efficiency upgrades. Energy Efficiency 12, 585–600 (2019). https://doi.org/10.1007/s12053-018-9654-4
15. Rudkevich, A. & Ruiz, Pablo. (2012). Locational Carbon Footprint of the Power Industry: Implications for Operations, Planning and Policy Making. (2012) http://dx.doi.org/10.1007/978-3-642-27431-2_8
16. Gagnon, P., Cole, W. Planning for the evolution of the electric grid with a long-run marginal emission rate, iScience, Volume 25, Issue 3, 103915, (March 18, 2022). ISSN 2589-0042. https://doi.org/10.1016/j.isci.2022.103915
17. Gagnon, Pieter, Will Frazier, Elaine Hale, and Wesley Cole. 2022. Cambium Documentation: Version 2022. Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A20-78239. https://www.nrel.gov/docs/fy23osti/84916.pdf
18. https://www.watttime.org/app/uploads/2021/08/GHG-Frameworks-WhitePaper-Tomorrow-WattTime-202108.pdf
19. https://www.tcr-us.com/uploads/3/5/9/1/35917440/marginal_emision_rates__the_needed_metric_of_carbon_displacement_in_an_increasingly_electrified_world.pdf

20. https://resurety.com/wp-content/uploads/2022/03/REsurety-Locational-Marginal-Emissions-A-Force-Multiplier-for-the-Carbon-Impact-of-Clean-Energy-Programs.pdf

9. If applicable, describe the process or stakeholders/groups consulted as part of developing this proposal.

This proposal is a collaboration between the members of the Emissions First Partnership - a group of companies working to reduce our emissions with impactful clean energy projects today:

- Akamai
- Amazon
- General Motors
- HASI
- HEINEKEN
- Intel
- Meta
- Rivian
- Salesforce
- Workday

10. If applicable, provide any additional information not covered in the questions above.

1. One major advantage of the emissions framework being proposed is that the need to calculate residual emission factors (which can be an overly burdensome process) is eliminated completely – the reporting company only needs to understand the impact of the specific site/generation relevant for reporting (marginal emission factor at that point on the grid), not calculate the remaining impact on all of the other actors on the the grid. This greatly simplifies implementation. The framework is also versatile in that it compares the emission impact of fossil generation sources (e.g. gas vs. coal).
2. It is important to note that accounting for avoided emissions under an emissions-based method is not the same accounting practice as accounting for removed emissions. Removing emissions through investments in nature based solutions, or technological solutions such as direct air capture, should be subtracted from companies' overall total emissions across all three scopes in an inventory. An emissions based method does not propose to blend the use of offsets or removal investments into the Scope 2 Guidance
3. In the Emissions based method proposed, there is a direct link between the aggregate total of all the Scope 2 emissions in the power grid and the direct emissions of the power sector. If the aggregate total of all the Scope 2 emissions from each of the entities in the power grid is zero, then the power grid has a net zero emissions grid. This is because the total Scope 2 emissions across all entities is equal to the Scope 1 emissions of the power sector. A fossil fuel power generator's Scope 2 is the difference between its direct emissions and its avoided emissions. Accordingly, if you add all the reported Scope 2 (including from generators' avoided emissions, and load induced emissions) together it is equal to direct stack emissions from the fossil generators (Scope 1). The change is that both load *and* generation now have Scope 2 emissions, whereas in the existing revision only load has Scope 2 emissions.
   This is important to note as in the framework proposed, a corporation could have a 'negative' Scope 2 emissions report – i.e. its avoided emissions is greater than its induced emissions. Other corporations could have a positive Scope 2 emissions report, i.e. its induced emissions

are greater than its avoided emissions.
By recognizing corporate leadership and appropriate progress, it can still be possible to have leaders for Scope 2 and those still progressing. Therefore an aggregate total of zero Scope 2 emissions and a net zero grid can still be achieved even with this variance in Scope 2 emissions reporting in an emissions based method.

4. The Emissions First Partnership recognizes that the proposal outlined in this document is merely a starting point on which to build out a more thorough accounting guidance. Significant work will be needed to build out the tactical details around particular sections of this proposal, such as specific ways to validate past purchasers and the prescribed cadence of guidance updates. As these topics will warrant discussion by many stakeholders as well as time to iterate, we propose addressing these details in future working groups, as a collaboration between the GHG Protocol and members of the Emissions First Partnership.

Proposal Annex

GHG Protocol Decision-Making Criteria and Hierarchy

A. First, GHG Protocol accounting and reporting approaches shall meet the GHG Protocol accounting and reporting principles:
- Accuracy, Completeness, Consistency, Relevance, Transparency
- Additional principles for land sector activities and CO_2 removals: Conservativeness, Permanence, and Comparability if relevant
- (See table below for definitions)

B. Second, GHG Protocol accounting and reporting approaches shall align with the latest climate science and global climate goals (i.e., keeping global warming below 1.5°C). To support this objective (non-exhaustive list):
- Direct emissions reported in a company's inventory should correspond to emissions to the atmosphere. Reductions in direct emissions reported in a company's inventory should correspond to reductions in emissions to the atmosphere.
- Indirect emissions reported in a company's inventory should in the aggregate correspond to emissions to the atmosphere. Reductions in indirect emissions reported in a company's inventory should in the aggregate correspond to reductions in emissions to the atmosphere.

C. Third, GHG Protocol accounting frameworks should support ambitious climate goals and actions in the private and public sector:
- Accounting framework/s would enable organizations to pursue more effective GHG mitigation/decarbonization efforts as compared to the existing standards and guidance
- Accounting framework/s would better inform decision making by reporting organizations and their stakeholders (e.g. related to climate-related financial risks and other relevant information associated with GHG emissions reporting)

D. Fourth, GHG Protocol accounting frameworks which meet the above criteria should be feasible to implement for the users of the frameworks.
- For aspects of accounting frameworks that meet the above criteria but are difficult to implement, GHG Protocol should provide additional guidance and tools to support implementation.

GHG Protocol Accounting and Reporting Principles

Principle	Definition
Accuracy	Ensure that the quantification of GHG emissions (and removals, if applicable) is systematically neither over nor under actual emissions (and removals, if applicable), and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the integrity of the reported information.
Completeness	Account for and report on all GHG emissions (and removals, if applicable) from sources, sinks, and activities within the inventory boundary. Disclose and justify any specific exclusions.

Consistency	Use consistent methodologies to allow for meaningful performance tracking of emissions (and removals, if applicable) over time and between companies. Transparently document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series.
Relevance	Ensure the GHG inventory appropriately reflects the GHG emissions (and removals, if applicable) of the company and serves the decision-making needs of users – both internal and external to the company.
Transparency	Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.
Conservativeness (Land Sector and Removals Guidance)	Use conservative assumptions, values, and procedures when uncertainty is high. Conservative values and assumptions are those that are more likely to overestimate GHG emissions and underestimate removals, rather than underestimate emissions and overestimate removals.
Permanence (Land Sector and Removals Guidance)	Ensure mechanisms are in place to monitor the continued storage of reported removals, account for reversals, and report emissions from associated carbon pools.
Comparability (optional) (Land Sector and Removals Guidance)	Apply common methodologies, data sources, assumptions, and reporting formats such that the reported GHG inventories from multiple companies can be compared.