

GHG PROTOCOL REVIEW PROCESS

COMMENTS ON THE SCOPE 2 GUIDANCE

Background information Scope 2 Guidance Survey Context

The Greenhouse Gas Protocol Scope 2 Guidance was published in 2015, developed over a three-year collaborative process with the input of over 200 representatives from companies, electricity utilities, government agencies, academia, industry associations, and civil society in over 23 countries.

Over the last seven years, this guidance has provided organizations across the globe a common framework to report indirect GHG emissions associated with the consumption of purchased electricity. By clarifying GHG Protocol's **accounting rules and fostering transparency, the Guidance** has supported organizations work to set emission reduction targets, develop internal abatement plans, disclose emission related data to investors and other stakeholders, and simplify compliance with mandatory reporting regulations among other benefits.

The last seven years has also demonstrated a need for further information to fully evaluate how the outcomes of the current Scope 2 Guidance location- and market-based accounting methods have compared with their design expectations and if updates could more effectively enable these outcomes. There has also been significant advancement in technology and data availability, as well as new regulatory policy which may necessitate updates and clarifications within the Scope 2 Guidance.

In light of these considerations and the urgency of climate action, Greenhouse Gas Protocol has launched a stakeholder process to evaluate changes to the current Scope 2 Guidance. This Stakeholder Survey is a first step in this process to gather inputs on both the empirical and conceptual questions to inform any Scope 2 revisions from global stakeholders including GHG programs (e.g., CDP, SBTi), businesses (e.g., companies using the guidance, clean energy developers, and consumers), governments, and other partners (e.g., environmental advocates, clean energy advocates, academics, etc.).

Description of Current Guidance

The Scope 2 Guidance establishes a framework for organizations to quantify indirect emissions of their purchased and consumed electricity, steam, heat, or cooling (herein collectively referred to as **“electricity”**, see **Scope 2 Guidance Section 1.2**). **These** emissions are considered as indirect because **while the emissions are the result of the organization's use of electricity, they physically occur at distant sources on the electric grid owned by another organization (e.g., by an electricity generator or**



utility). Under the current Scope 2 Guidance, companies are required to report these indirect emissions using two different methods, referred to as the “Location-based” (Section 4.1.1) and “Market-based” (Section 4.1.2) reporting methods. Chapter 7 of the Guidance details reporting requirements and chapters 4, 8-11 provide additional context on these two methods. Please see GHG Protocol Scope 2 Guidance for additional detail.

Questions on the Scope 2 Guidance (selection)

13. Do you think there is a need to update the GHG Protocol Scope 2 Guidance?

- No (no update needed)
- Minor update (limited updates, clarifications, additional guidance, or refresh needed)
- Major update (major changes or revisions needed)
- No opinion/Not sure

14. Please explain your selection. You may enter brief comments here or submit a more detailed proposal using the proposal template.

The currently perceived options in corporate accounting pave the way for cherry picking and may lead to double counting. Corporates need clear guidance on which accounting route to use and when. In order to prevent double counting, options for the application of the location-based or market-based approach should be clearly defined according to market characteristics. In markets with binding rules on energy disclosure and a harmonized energy tracking system, only the market-based approach shall be used. For more detailed elaboration see proposal template on the market-based approach.

15. Do you think there is a need for updates related to the scope 2 location-based methods?

- No (no update needed)
- Minor update (clarifications or additional guidance needed)
- Major update (major changes or revisions needed)
- No opinion/Not sure

16. Please explain your selection. You may enter brief comments here or submit a more detailed proposal using the proposal template.

In case of doubts on the reliability of the disclosure framework or where contractual instruments do not meet the quality criteria, the location-based approach shall be used instead of the market-based approach. This is in line with current GHG protocol scope 2 guidance (“If no facilities in the entire organizational boundary of the reporting entity are located in markets with contractual



claims systems, or where no instruments within those systems meet Scope 2 Quality Criteria required by this document, then only the location-based method shall be used to calculate scope 2', p. 44). What we propose is an update to define clear conditions for when actors would be required to use the market-based approach only (see above, in case of a market area where binding energy disclosure rules and a harmonized energy tracking system are established).

If there is not a legally binding disclosure and energy tracking framework in place, but a voluntary disclosure and energy tracking system which meets the Scope 2 Quality Criteria, dual reporting shall be applicable (see response to question 20).

Further guidance may be needed on the choice between regional/subnational and national emission factors within the location-based approach. Cherry picking and double counting may result if some actors in the same geographical boundary use regional or subnational emission factors, and others use national emission factors (e.g. companies in a grid distribution region A with a high share of renewables use the regional emission factor, companies in a region B with a low share of renewables use the national emission factor which includes renewable energy production from region A). In this regard, the market-based approach has a clear advantage in ensuring an unambiguous allocation of renewable energy attributes.

17. Do you think there is a need for updates related to the scope 2 market-based method?

- No (no update needed)
- Minor update (clarifications or additional guidance needed)
- Major update (major changes or revisions needed)
- No opinion/Not sure

18. Please explain your selection. You may enter brief comments here or submit a more detailed proposal using the proposal template

In order to prevent double counting the market-based approach should be strengthened and should be applicable for markets with binding rules on energy disclosure and a harmonized energy tracking system. Energy tracking systems like European Guarantees of Origin (GOs) provide a transparent and traceable system for green energy production. Compared to the location-based approach, the core strength of the market-based approach is that it enables consumer influence on the expansion of renewable energy supply, when consumers procure energy from grids. For consideration of consequential market effects, the market-based approach should be accompanied by additional quality criteria.

Organisations choosing the market-based approach should demonstrate that a reliable governance framework for disclosure and tracking system exists in the relevant market area. Eventually, a harmonised global standard (e.g. ISO, cf. the European Standard EN 16325) on



energy tracking systems and disclosure would be desirable, with national/regional systems being checked for compliance.

Central criteria for reliability can be derived e.g. from Article 19 of the European Renewable Energy Directive, the European Guarantees of Origin Standard EN 16325, the "Principles and rules of operation for the European Energy Certificate System (EECS)" (see <https://www.aib-net.org/eecs/eecsr-rules>) or the results of the "Reliable Disclosure Systems for Europe" project (http://www.reliable-disclosure.org/upload/222-RE-DISS_Best_Practice_Recommendations_v2.4_Final.pdf). For example:

- Energy attribute tracking & disclosure systems need to ensure that the same unit of energy from renewable sources is taken into account only once.
- This usually implies the existence of a central registry (e.g. national/regional/continental), or, in an international context, set of registries which coordinate with each other
- The energy attribute tracking system needs to be accompanied by a binding (e.g. national) disclosure system, which clearly defines under what conditions statements can be made about renewable energy characteristics of energy supply
- Control mechanisms should be in place to ensure that Energy Attribute Certificates (EACs) and the data recorded in them are accurate, reliable and fraud-resistant, and that also statements made about the renewable character of energy supply are accurate (e.g. backed by cancellation of the correct amount of EACs).

For the relevant market area, a residual mix calculation needs to exist and residual mix information needs to be available to consumers.

Organisations that cannot prove cancellation of energy attribute certificates (or employ an equivalent explicit, harmonised tracking mechanism) for the energy supplied to them, shall use the attributes of the residual mix for their accounting (rather than the location-based generation attribute mix that is not adjusted for explicitly tracked attributes). Only in this way, double counting can be avoided.



Table 1: Comparison of the location-based and the market-based approach

	Location-based approach	Market-based approach
Market structure	Can be applied anywhere in the world.	Corresponds to the structure of liberalised electricity markets.
Assessment basis for emission factor	Approximates physical conditions through average emission factor of the grid. But ignores actual and temporal feed-in.	Refers to the contractual relationship between supplier and consumer.
Proof	Electricity characteristic of the national average power mix.	Supplier statements, electricity product labelling, EACs, PPAs.
Advantages	Causal relationship between energy consumption and generation within a grid.	Rewards the consumer's procurement decisions.
Promotion of awareness	Low, as consumers have virtually no influence on the national power mix. Only a reduction in consumption leads to a reduction in emissions.	Promotes acceptance of the energy transition and awareness of the emissions resulting from electricity consumption.
Consumer influence on RE expansion	None.	Depends on the additional benefit of the electricity product.

Source: Based on Mundt et al. 2019; Sakhel et al. 2022.

19. Do you think there is a need for updates related to the dual reporting requirement, i.e., to report scope 2 emissions using both the location-based method and market-based method?

- No (no update needed)
- **Minor update (clarifications or additional guidance needed)**
- Major update (major changes or revisions needed)
- No opinion/Not sure

20. Please explain your selection. You may enter brief comments here or submit a more detailed proposal using the proposal template.

In markets without reliable regulations dual reporting shall be applicable. The presentation of the results of both calculation methods should be obligatory in this case, to prevent that the approach



with the lowest emissions is used. If a company does not source a green energy product, proven by a reliable energy tracking mechanism (such as EAC cancellation), the result of the market-based approach shall be calculated using the residual attribute mix of the market area.

In principle, dual reporting is already required by the GHG protocol Scope 2 Guidance. However, in practice, there is scope for companies to choose between communicating either the result of the location-based or market-based approach, which leads to double counting.

24. **Chapter 11 of the Scope 2 Guidance, titled “How Companies Can drive Electricity Supply**

Changes with the market-based method”, elaborates how organizations can use their procurement power to substantively contribute to new low-carbon energy supply. In this context, does your organization pursue any of the options suggested in Chapter 11 and/or otherwise empirically evaluate the connection between changes in GHG emissions to the **atmosphere and your organization’s** scope 2 related decarbonization investments?

- Yes
- No
- Not sure

25. If so, how?

As stated in Chapter 11 of the Scope 2 guidance, the positive impact of the market-based approach is that a growing supply of green energy should be induced by higher prices resulting from growing demand. Currently the European electricity GO market shows part of this effect: Limited supply and rising demand created prices that were not previously anticipated.

Although no empirical studies focusing specifically on this question are available yet, the GO market in Europe has undergone significant changes in recent years, with much higher price levels observed than in the past. Also, the quality of GOs is increasingly relevant. Particularly, the role of long-term Power Purchase Agreements (PPAs) with unsupported renewable energy plants is gaining importance (see e.g. <https://resource-platform.eu/buyers-toolkit/> for an overview of the development of Green Corporate PPAs in Europe). PPAs as a means to provide investment security for market-financed renewable energy plants are also increasingly recognized e.g. in EU proposals for future electricity market design. PPAs require the reliable transfer of Energy Attribute Certificates (Guarantees of Origin in the EU) to work, so PPA partners can unequivocally claim green energy attributes. In this way, the market-based approach is set to become a much stronger driver for renewable energy expansion in the future.

In assessing the role of PPAs, it is important to consider that corporate PPAs with a direct contract between a RES plant and a corporate consumer are only feasible for large energy consumers. More common are PPAs with energy supplier involvement, where energy suppliers cancel GOs



from contracted plants in favor of their customers. The existence of a PPA between a corporate consumer and a renewable energy plant should therefore not be made a prerequisite for judging the market-based approach's effectiveness in incentivizing renewable energy investments. A green electricity supply contract, where electricity is bought from energy suppliers who in turn contract electricity via PPAs or invest in renewable energy capacities themselves can be equally effective. For the additionality impact of green electricity demand, it is important that at least a share of the green electricity stems from unsupported, new plants. This can be proven by cancelling EACs with the appropriate attributes (regarding support status and plant age).

Using the options of the location-based or the market-based approach may lead to a diverging outcome in total GHG emissions accounting. However, with the location-based approach, there is no incentive for corporate energy consumers to conclude a PPA or make a supply contract with energy suppliers who in turn conclude PPAs or invest in their own renewable energy generation capacity. By doing so, a corporate consumer's impact on the average grid attribute mix and average grid emission factor, which is used for the location-based approach, would be minimal. Only the market-based approach leads to active incentives for companies to support renewable energy expansion when sourcing electricity from grids (this also applies for gas sourced from gas grids or heating/cooling sourced from district heating or cooling grids). The prerequisite is that corporate consumers can fully claim the renewable energy attributes and associated emission factors of their green energy contracts.

26. Has your organization identified any instances where application of the current Scope 2 Guidance has led to changes in your reported GHG inventory (i.e., an increase or decrease in reported emissions) while potentially leading to an unequal or opposite outcome in total GHG emissions to the atmosphere?

- Yes
- No
- Not sure

27. If so, please explain.

The question of impacts of renewable energy expansion on total GHG emissions in the atmosphere needs to be answered on an aggregate level (see reply to question 36 below). EACs are not a tool to make statements on this, but merely allow the allocation of energy attributes and emission factors from specific production devices to consumers.

Negative impacts on overall GHG emissions are possible, if companies use EACs to compensate emissions – this use must be clearly forbidden by the disclosure and energy tracking framework. Such a practice would lead to double counting of emission reductions, as emission reductions by renewable energy production are typically counted towards national targets. Exceptions apply if



countries have made arrangements to issue authorized emission credits accompanied by an adjustment of national GHG emission balances – however, in this case such authorized credits would have to be used for compensation purposes, not EACs, which fulfill an entirely different purpose.

Another possible negative impact on overall GHG emissions could occur if sourcing a green energy product led to a decrease in GHG mitigation efforts in other areas of a company's activities. However, we are not aware of any empirical evidence for such an effect, nor does it reflect our experience in researching green energy demand. Sourcing green energy products only impacts Scope 2 emissions. To achieve emission reduction targets and long-term climate neutrality targets, companies must implement a range of measures including energy efficiency investments and a substitution of own energy production facilities by renewable energy alternatives. Even if decarbonizing Scope 2 emissions may be one of the lower hanging fruits implemented early on in climate change mitigation strategies, direct competition with more far-reaching measures seems unlikely. For one, measures such as energy efficiency investments and the substitution of a company's own energy production facilities are incentivized by a range of measures, such as CO₂ prices, cost reductions in energy sourcing costs and national support frameworks. Moreover, the GHG Protocol rules provide for a transparent distinction between accounting for Scope 1, 2 and 3 emissions. If this is the case, it would not be possible to hide a lack of effort in reducing Scope 1 or 3 emissions by a decarbonization of Scope 2 emissions alone.

Aligning green electricity sourcing decisions with aggregated impacts on GHG emissions may be improved by increasing the temporal and spatial granularity of energy tracking and disclosure. This is particularly relevant for large electricity consumers, whose demand may directly impact electricity prices and the merit order of production devices employed to cover electricity demand. If electricity demand is high in times with low renewable energy production, this may increase the run-time of fossil fuel plants and therefore GHG emissions. Using granular, time stamped EACs from a market zone definition which takes grid constraints into account (e.g. price bidding zones) could mitigate this effect. However, higher transaction costs of this form of energy tracking have to be taken into account (e.g. by requiring an hourly matching of supply and consumption profiles as part of disclosure rules), so this may primarily be an option for larger energy-intensive corporate consumers and Power-to-X-producers (e.g. for green hydrogen), at least to begin with.

29. Are there existing resources, tools, or databases developed by other organizations that you would suggest that GHG Protocol consider to support organizations in applying the Scope 2 Guidance?

Criteria for and design of reliable Energy Attribute Certificate and Disclosure systems: Article 19 of the European Renewable Energy Directive, EN 16325, European Energy Certificate System



(EECS) of the Association of Issuing Bodies (see <https://www.aib-net.org/eecs/eecsr-rules>), results of the "Reliable Disclosure Systems for Europe" project (http://www.reliable-disclosure.org/upload/222-RE-DISS_Best_Practice_Recommendations_v2.4_Final.pdf) Granular energy attribute certificates: EnergyTag standard (<https://energytag.org/wp-content/uploads/2022/03/20220331-EnergyTag-GC-Scheme-Standard-v1-FINAL.pdf>)

30. Are there new resources, tools, or databases that you think need to be developed to support organizations in applying the Scope 2 Guidance?

Development of international standards and organizations (or networks of organizations) to supervise reliability of national energy attribute tracking and disclosure (similar to the Association of Issuing Bodies in Europe)

31. Are there challenges in complying with the GHG Protocol Scope 2 Guidance requirements? If yes, please briefly describe the challenges as well as any potential solutions, industry-specific guidance, etc. that could address these challenges. You may enter brief comments here or submit a more detailed proposal using the proposal template.

The GHG Protocol Scope 2 Guidance is quite clear. Challenges result from different accounting options (location-based / market-based), that may lead to the misconception of available choices or leave room for interpretation.

Another issue which might benefit from clarification could be the differentiation between scope 1 and scope 2 if a separate legal entity within a company family supplies another legal entity within the company family with energy.

36. **Based on the past seven years' worth of data, under the current market-**based accounting framework, is there empirical support for the premise that market-based scope 2 accounting framework results in collective changes in low-carbon energy supply and global atmospheric GHG emission reductions? Please explain, including empirical justification on why or why not. You may enter brief comments here or submit a more detailed proposal using the proposal template.

In the context of this question, distinguishing between impacts on collective changes in low-carbon energy supply and global atmospheric GHG emission reductions is important.

The purpose of EACs is to allocate the attributes of energy generation from specific production devices to specific consumers (see reply to question 27). For electricity and heating and cooling supplied via grids, which are fed from a multitude of renewable and non-renewable production devices, this is the only feasible way to track renewable energy characteristics and market green energy products (for gases and liquid energy carriers, mass-balancing is also established as a tracking mechanism). As long as EACs (or mass-balancing approaches) are used as a verification instrument in the context of disclosing the attributes of Scope 2 energy supply, they merely allocate emission factors that are determined at the energy production stage to consumers (i.e.,



they answer the question of what consumers can claim to have been supplied by renewable energies with an emission factor of zero).

The actual impact of renewable energy production on total GHG emissions in the atmosphere is more complex: This depends on the amount and type of fossil production that is actually replaced by renewable energy production, which in turn is influenced by the broader framework of energy market and policy design and the overall generation profile in any given hour. For instance, in the case of electricity production, a MWh of additional renewable electricity production may replace coal or gas as marginal producers, or it may not lead to a reduction in coal and gas production at all, as replaced electricity quantities may be exported. Also, it would be difficult to determine which effect could be attributed to which renewable electricity production from which exact plant. Therefore, while the emission factor of energy production can be recorded on EACs on issuance, the same is not true for the GHG mitigation impact of a given MWh of renewable energy production (as this depends on what amount and type of non-renewable energy production has been replaced).

As a result, the question of impacts of renewable energy expansion on total GHG emissions in the atmosphere needs to be answered on an aggregate level. EACs are not a tool to make statements on this, but merely allow the allocation of energy attributes and emission factors from specific plants to consumers.

With regard to the impact of green energy demand on collective changes in low-carbon energy supply, more empirical studies – and particularly up-to-date empirical studies – are necessary, including qualitative empirical research focusing on drivers of investment decisions in renewable energy plants. In Europe, renewable energy expansion is at an important turning point – up to now, expansion has largely been driven by public support programs in many countries, but with increasing CO₂ prices from the EU Emissions Trading System and decreasing technology costs, renewable energies are increasingly becoming competitive.

The additionality impact of green electricity demand depends largely on whether this demand is focused on unsupported, new (or at least refurbished) plants or not. Realizing renewable energy plants outside of support frameworks is increasingly becoming feasible, and sourcing green energy products (electricity, but also gases or heating and cooling) under the market-based approach can be an important factor in supporting this development. This is particularly the case for long-term purchasing agreements which provide planning security for producers, which are increasingly gaining market-relevance (see e.g. <https://resource-platform.eu/buyers-toolkit/> for an overview of the development of Green Corporate PPAs in Europe). However, as argued in the response to question 25, it is secondary for the impact on renewable energy expansion whether a PPA with an unsupported plant is concluded between a corporate consumer and a renewable energy producer directly or between an energy supplier and a renewable energy producer. For the



impact on investment security, it is also secondary whether the PPA encompasses electricity deliveries between balancing groups (in case of physical PPAs) or whether its focus is on providing price security of producers and consumers by means of a Contract for Difference (in case of financial or virtual PPAs). For all these types of PPAs, however, making a claim on the allocation of renewable energy attributes requires the use of EACs (or alternative tracking mechanisms such as mass balancing in case of gases and liquid fuels). The application of the market-based approach could therefore become an important driver of renewable energy expansion in the future.

Standards such as the GHG protocol can support this development by making the quality of green energy sourced as part of the market-based approach more visible (e.g. regarding the support status and age of plants, or the question if energy has been sourced as part of a PPA, see reply to question 40). Initiatives such as RE100 already include quality criteria aimed at ensuring additionality impacts of green electricity demand (see <https://www.there100.org/sites/re100/files/2022-12/Dec%2012%20-%20RE100%20technical%20criteria%20%2B%20appendices.pdf>).

37. If necessary, are there changes to the market-based framework that can ensure rigorous accounting that demonstrates collective changes in low-carbon supply and global atmospheric GHG emission reductions? If unnecessary, why; If so, what changes? You may enter brief comments here or submit a more detailed proposal using the proposal template.

Preconditions for a rigorous accounting framework for the market-based approach are the existence of binding disclosure rules and a reliable energy tracking framework, in order to exclude double counting of renewable energy attributes (see reply to question 18). Making the market-based approach mandatory in regions where this is the case will strengthen the reliability of the accounting framework (by excluding double counting resulting from actors choosing either the market-based or the location-based approach in the same market area).

As discussed in Question 25, 27, 36 defined quality criteria (e.g. share of supply from unsupported, new, fluctuating renewable energy plants) should be integrated to the reporting framework to initiate collective changes in low-carbon supply.

Questions on Scope 2 Guidance Attribute Quality Criteria

The Scope 2 Guidance Quality Criteria requirements were developed to represent the minimum features necessary to implement a market-based method of scope 2 GHG accounting using Energy Attribute Certificates (EACs). As designed, the market-based accounting method allows organizations to report in their inventory an immediate GHG emission reduction without necessarily needing to demonstrate a corresponding immediate and equivalent reduction in emissions to the atmosphere. This outcome is consistent with the supply/demand aggregational theory of change



described above. (Note, please see questions 20-21 evaluating this topic.) However, the current EAC quality criteria required to claim the zero-emission attributes of a grid resource enables a range of EAC procurement options representing a broad spectrum of outcomes a reporting organization can take responsibility for in their inventory. Narrowly in the context of scope 2 inventory accounting, so long as the minimum quality criteria are fulfilled, all procurement options, strategies, etc. are treated equivalently. Chapter 7, Criteria 4 “Vintage” states all contractual instruments shall “Be issued and redeemed as close as possible to the period of energy consumption to which the instrument is applied.” Common practice today is for an organization to match some amount of their annual electric consumption load with Energy Attribute Certificates (EACs) produced in the same reporting year.

38. What are the trade-offs between continuing this practice as compared to introducing a more **specific quality criteria than “as close as possible”**? **Should this quality criteria be made more specific** (e.g., to specify it must be within the same year, month, hour, etc.) or remain unchanged? Please briefly explain or use the proposal template for a detailed reply.

The guidance should specify that the matching of production and consumption periods should at least refer to the same calendar year, with a finer temporal granularity being possible on a voluntary basis.

The quality criteria “as close as possible” is rather vague and allows, in principle, for the use of EACs issued for production that did not take place in the same calendar year as consumption/energy supply. A standardized disclosure period is necessary, however, for a correct balancing of attribute supply and demand and for residual mix calculation (at least for each market area). Annual matching is well established e.g. in the EU and can be implemented with limited administrative effort.

A more granular resolution of energy tracking and disclosure can take place within the annual framework on a voluntary basis, as long as information on the issuance and cancellation of granular EACs feeds back into annual accounting (e.g. energy attributes tracked by granular EACs need to be subtracted from the annual residual mix).

Matching renewable energy supply and demand on an hourly or even quarter-hourly basis could be established as an additional quality criteria in the GHG Protocol Scope 2 Guidance. Given that technical solutions for hourly matching are just starting to be rolled-out and incorporation into national EAC systems largely has not happened yet, the application of this quality criteria should remain voluntary for now, however. In their GHG reporting, companies could report the share of 24/7 green energy supply covered by hourly or quarter-hourly matching of renewable energy supply and demand. At a later stage, once more experiences are available on implementation costs and the integration with national disclosure and energy tracking frameworks, reporting



requirements on the share of 24/7 supply of green electricity could be made binding, if this was considered feasible based on future evaluations and Guidance surveys.

Chapter 7, Criteria 5 “Market Boundaries” states all contractual instruments shall “Be sourced from the same market in which the reporting entity’s electricity-consuming operations are located and to which the instrument is applied.” Currently certificate market-boundaries encompass broad geographic regions such as entire continents and span multiple physical grid boundaries (i.e., see Scope 2 Guidance, page 64: “...markets for unbundled certificates have often been less constrained than those for electricity itself”).

39. What are the trade-offs between continuing this practice as compared to introducing more specific guidance on the Market Boundary quality criteria? Please briefly explain or use the proposal template for a detailed reply.

Generally, the open formulation **of the criteria “market boundary” is appropriate, as electricity** market design and its degree of spatial integration can vary widely between geographic regions. In case of international market boundaries, however, it should be specified that there should be a grid connection between the country of energy production and consumption, or that both countries are part of a wider interconnected regional network (in this case, direct grid connections between individual countries would not be necessary). Such a specification of the quality criteria could enhance the credibility of the market-based approach, because a theoretical physical deliverability of energy between national market boundaries would be ensured. On the other hand, attempting to track individual grid connections between production and consumption locations would not be feasible and would not reflect the nature of electricity markets, where security of supply and grid stability is ensured by a variety of transactions inclusively short-term purchases on intraday and balancing energy markets.

If a market boundary’s electricity market design encompasses smaller system units such as price bidding zones, the share of green electricity/EACs sourced from the same bidding zone should be reported on, if the binding rules on energy disclosure encompass these smaller system units. This would incentivise contributions to the expansion of renewables with a meaningful spatial correlation to the point of consumption. The reason is that bidding zones reflect national or subnational scarcities in renewable energy supply, as the relation between overall supply and demand is reflected in bidding zone-specific electricity prices. The same applies, to a degree, to bottlenecks in grid transmission capacities, if such bottlenecks are considered in the definition of bidding zones.

When applying the market-based approach to **district heating and cooling, we’d recommend** strongly that the share of green district heating and cooling sourced from the same grid that a consumer is connected to is reported on. Given that heating and cooling grids are mostly local or



at most small regional systems with clear grid boundaries, the credibility of using EACs from non-interconnected grids for disclosure purposes is highly uncertain.

Chapter 7: Scope 2 Quality Criteria presents eight specific quality criteria

40. Please provide any additional considerations related to any of these criteria and/or potential additional criteria that could improve the application of location-based and/or market-based Scope 2 reporting (see Scope 2 Guidance, Chapter 4 for additional detail on how these methods contribute to GHG reductions in the electricity sector). Please briefly explain or use the proposal template for a detailed reply.

The Scope 2 Quality Criteria should be extended to not only cover the proof that EACs or a green energy product is being sourced, but also proof of the quality of EACs or green energy products employed. By making the quality of green energy more visible within the GHG Protocol Scope 2 reporting framework, the **market-based approach's effectiveness in contributing to aggregate** changes in energy supply could be strengthened.

In order to have an additional impact beyond political support frameworks, energy from unsupported new renewable energy plants can be assigned a particularly high quality value (new meaning e.g. less than six years old, with older plant ages being permissible if a long-running PPA exists). Nevertheless, green energy demand for energy from new supported plants can also have additionality impacts, if revenues for EAC sales reduce required subsidies and savings in public funding per project translate to a higher number of renewable energy projects being realized. Furthermore, additionality impacts are possible in case of green energy from existing plants whose subsidies have run out and whose operating life can be extended thanks to revenues from green energy marketing.

Further quality criteria could also refer to the granularity of temporal and spatial matching between renewable energy supply and demand (see replies to questions 38 and 39 above) or to the portfolio of technologies that EACs are sourced from (e.g. by demonstrating a certain share of energy demand has been covered by the fluctuating renewables wind and solar).

Another quality criterion could be the share of energy supplied via a long-term purchasing agreement, to indicate that a contribution is being made to the planning security of renewable energy investments. This should not only include physical PPAs, but also virtual/financial PPAs with Contracts for Difference, as these also provide financial planning security to renewable energy producers.

As the Greenhouse Gas Protocol is a standard whose harmonising effect depends on its broad applicability, the criteria on green energy quality listed here should not be formulated as binding



prerequisites for applying the market-based approach – rather, we suggest introducing reporting requirements on the share of energy consumption for which these additional quality criteria are being met.

Sets of quality criteria for green electricity supply have been formulated by e.g. WWF Germany (<https://www.wwf.de/fileadmin/fm-wwf/Publikationen-PDF/Klima/WWF-green-power-criteria.pdf>) or the RE100 initiative (<https://www.there100.org/sites/re100/files/2022-12/Dec%2012%20-%20RE100%20technical%20criteria%20%2B%20appendices.pdf>). Please refer to our proposal submission for a detailed summary.

Table 2: Comparison of quality criteria for purchased electricity established by WWF and RE100

Quality Criteria	RE100 Technical Criteria (RE100, 2022)	„Next generation green power“ - WWF (WWF, 2021)
Commissioning date	<ul style="list-style-type: none"> Procurement from facilities not older than 15 years (commissioned or repowered). Additionally, labels could be used to prove that the purchased electricity is from newly commissioned projects. Non-exhaustive list of labels: Green-e[®], EKOenergy[®], and Gold Standard[®] labels. 	<ul style="list-style-type: none"> At least one-third (33%) of the electricity should be sourced from newly constructed but non-subsidized plants that were not commissioned more than six years ago.
Subsidy	No specification.	<ul style="list-style-type: none"> A maximum of one-third (33%) of the electricity should be sourced from plants that are subsidized by the state AND were not commissioned before 2020 and, from 2026 onwards, not commissioned more than six years ago. A maximum of 33% of the electricity should be sourced from existing plants that have been subsidized but do not receive follow-up subsidies.
Power Purchase Agreement (PPA)	Physical and financial/virtual renewable PPAs are considered as fulfilling the quality criteria for renewable electricity.	<ul style="list-style-type: none"> If a power plant is realized via a PPA, it is recognized for providing green electricity for more than the above defined 6 years. Short term PPAs (3 years) for plants that no longer receive subsidies are also accepted.



Quality Criteria	RE100 Technical Criteria (RE100, 2022)	„Next generation green power“ - WWF (WWF, 2021)
Technology	<ul style="list-style-type: none"> • Energy sources that are recognized as renewable: <ul style="list-style-type: none"> ○ Wind ○ Solar ○ Geothermal ○ Sustainably sourced biomass (including biogas) ○ Sustainable hydropower 	<ul style="list-style-type: none"> • Onshore wind energy, offshore wind energy, photovoltaics, concentrated solar power (CSP) and deep geothermal energy are considered as renewable energies. <p>The share of photovoltaic and/or wind energy should be as high as possible and should be increasing every two years, optionally supplemented by geothermal electricity.</p>
Biomass	<ul style="list-style-type: none"> • Biomass and Hydropower based electricity generation is only recognized as sustainable if third-party verification is proven. Non-exhaustive list of standards (sustainability criteria will be further studied by RE100 and may be introduced in the future): <ul style="list-style-type: none"> ○ ISO 13065:2015 (specifies principles, criteria, and indicators for the bioenergy supply chain to facilitate assessment of environmental, social and economic aspects of sustainability) ○ The Green-e® Renewable Energy Standard for Canada and the United States ○ The Low Impact Hydropower Institute (LIHI) <p>The Hydropower Sustainability Council's Hydropower Sustainability Standard</p>	<p>Biomass plants should only use waste materials from agriculture or biogenic waste collected from municipalities, the restaurant sector and the food processing industry. Biomass should not be imported as a source of energy.</p>
Hydropower		10 % maximum share of hydropower from 2036 onwards.
CHP Systems	CHP systems are only considered renewable if the fuel used for electricity generation is renewable.	No specifications on CHP.
Timing	To make a credible renewable electricity claim, the vintage of the attributes (and certificates) – that is, when the	Until 2035 90 % of the electricity procured by an entity should be compliant with the WWF criteria.



Quality Criteria	RE100 Technical Criteria (RE100, 2022)	„Next generation green power“ - WWF (WWF, 2021)
	<p>generation occurred – must be reasonably close to the reporting year of the electricity consumption to which it is applied. There is no official consensus on what is “reasonable” in this case, and it may vary between markets.</p>	
<p>Market location</p>	<ul style="list-style-type: none"> • Attributes (and certificates) must be sourced and purchased from within the same defined geographic region that constitutes a “market” for the purpose of transacting and claiming attributes. <ul style="list-style-type: none"> ○ As per RE100 individual countries are distinct markets for renewable electricity. ○ Exemptions are made for single markets (Europe as well as the single market USA-Canada). • Europe is considered as single market with following restrictions: <ul style="list-style-type: none"> ○ The country is a member of the Association of Issuing Bodies (AIB). <p>The country has a grid connection to another country within the single market Europe.</p>	<p>No criteria regarding the country/market of origin.</p>

Source : Based on WWF (2021) and RE100 (2022)

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Hamburg Institut

March 2023