Debate over Scope 2 emissions accounting

RECS guidance for members

About RECS energy certificate association

For over 20 years RECS has been committed fighting climate change and accelerating the energy transition by supporting the purchase of renewable energy through robust, reliable, transparent markets. Energy Attribute Certificates (EACs) are the tools we use to unlock this vision. At RECS we support the development of both existing and new EAC markets around the world. We engage with a wide range of stakeholders, including governments, market participants and consumers, and provide the knowledge and information they need to boost consumer demand for renewable energy. RECS works to provide the knowledge, motivation, and confidence needed to buy 100% renewable energy. More information can be found at www.recs.org.

Background

The GHG Protocol Corporate Accounting and Reporting Standard sets out how companies and other organizations should measure and report on their greenhouse gas (GHG) emissions. The Standard was last updated in 2015 with the publication of specific guidance on scope 2 emissions – those from purchased or acquired electricity, steam, heat, and cooling[1]. The Greenhouse Gas Protocol is a crucial tool for corporates working to cut their emissions and for assessing the impact of their actions. ***It is the world's leading authority and international standard-setter on corporate GHG accounting[2] and the scope 2 guidance was only published after 4 years of expert discussion and negotiation.***

A brief overview of the current guidance

The GHG Protocol Scope 2 guidance document recognises that all electricity consumers have significant opportunity to reduce their emissions by reducing their electricity use and by buying any power they still need from low-carbon and/or renewable sources. At the most basic level, the guidance recommends multiplying activity data (MWh of electricity consumption) by source and supplier-specific emission factors to arrive at the total GHG emissions impact of a corporation's electricity use. The guidance puts forward two methods for calculating a corporation's emissions from purchased electricity.

---

1 Scope 1 = emissions from direct activities e.g., running boilers or vehicles. Scope 2 = emissions from indirect activities e.g., electricity bought from a separate supplier. Scope 3 = emissions from related activities e.g., emissions from supply chain partners.

2 https://ghgprotocol.org/corporate-standard

1. A location-based method: This reflects the average emissions intensity of grids on which energy consumption occurs (using mostly grid-average emission factor data). Using this method, a corporate can multiply its total electricity consumption (in MWh) by the average level of emissions per MWh of the grid area from which they take power.
2. A market-based method: This reflects emissions from the electricity that companies have purposefully chosen by buying from a specific generator or supplier. A corporate can prove such power purchases by acquiring and cancelling the relevant energy attribute certificates (EACs).

Each of these methods can lead to the reporting of corporate scope 2 emissions. Therefore, the guidance states that:

> *Companies with any operations in markets providing product or supplier-specific data in the form of contractual instruments shall report scope 2 emissions in two ways and label each result according to the method: one based on the location-based method, and one based on the market-based method. This is also termed "dual reporting."*

Critics ignoring consensus

The Scope 2 guidance is the result of lengthy, detailed, and inclusive discussions between a broad range of stakeholders from different countries and sectors. Despite this, there remains a minority who refuse to accept this consensus-based outcome which gave a prominent role to the market-based method of scope 2 GHG emissions accounting. These critics, mainly academics who do not actively participate in the practical aspects of scope 2 reporting, seem believe that market-based accounting should be abandoned. The most recent example of these criticisms came in a paper[3] in which the authors repeat the same arguments that they have raised over the past decade. These arguments are summarised below in four main points:

1. Bundled EACs, such as renewable power purchase agreements (PPAs), can lead to more renewable capacity thanks to long-term stable prices that support investment decisions.
2. The emissions reductions of this additional renewable capacity should be shared among all consumers, not only by the EAC/PPA holder.
3. Unbundled EACs cannot lead to more renewable capacity because their low, short-term prices do not support investment decisions.
4. Without additionality, there is no emissions reduction benefit to purchasing renewable energy via unbundled EACs and therefore no emissions reduction claim should be made.

Overall, these critics seem sceptical about the possibility of being able to convincingly demonstrate the potential impact of market mechanisms in supporting the development of

3 Bjørn, A., Lloyd, S.M., Brander, M. et al. Renewable energy certificates threaten the integrity of corporate science-based targets. Nat. Clim. Chang. 12, 539-546 (2022). https://doi.org/10.1038/s41558-022-01379-5

renewable energy. This critics' conclusion and proposals have led some stakeholders to conclude that they are seeking to undermine market-based emissions counting in its entirety. They seem to prefer location-based reporting despite the clear drawbacks this approach faces. These failings are highlighted below.

The value of market-based accounting

There are several reasons to retain market-based accounting of scope 2 emissions through the use of energy attribute certificates:

1. *Without a market-based mechanism for buying renewable energy, no consumer can choose to pay for a specific energy product and is only left with a commodity market.*
2. *Corporations that buy renewable energy are reducing their environmental impact and deserve a reliable mechanism for claiming their individual emissions reductions.*
3. *The strong distinction between energy purchases that are bundled with EACs and those that are unbundled is misplaced.*
4. *The concept of additionality is complex and is best examined in a mature market, such as the European GO market where the supply and demand of EACs are reaching equilibrium.*
5. *The authors only consider the role and purpose of unbundled EACs from the perspective of buyers, while in any market the value of a product to the seller must also be considered.*

Each of these 5 points is examined in more detail below.

1. EACs make energy a product – not a commodity

EACs embody information about a given unit (MWh) of energy. This information allows for distinctions to be made between diverse types of energy. These distinctions allow producers and suppliers to develop specific energy products, from which consumers can then choose. Knowing who consumes what product is essential for making reliable corporate claims. This also enables possible policy interventions following the 'polluter pays principle' which wouldn't be possible if all energy users were only allowed to claim the same grid average. ***Without the information included in EACs, energy cannot become a product and must remain a commodity.*** Commodities are broadly interchangeable and indistinguishable from each other. Oil from Venezuela can be switched to oil from Saudi Arabia, and wheat from Canada can be interchanged with wheat from Australia. ***Because they lack specific attributes, commodities are primarily traded on price.***

A location-based only system for trading energy reduces all energy to a commodity, with MWh being indistinguishable from each other and traded only on price. We already see this in the trade of un-certified energy in wholesale power markets. ***In a market-based system, EACs allow energy attributes to become a product.*** This allows producers to develop specific energy products and for consumers to indicate their preference for such products through their demand.

If the market-based mechanism is abandoned, EACs would cease to have any reason to exist. This would prevent the development of any specific energy product and would

prevent the selling, or buying, of specific types of energy that could positively impact the energy transition. There is no alternative to the market-based mechanism and EACs for the development of specific energy products. Without specific energy products, there is no option for consumers to make energy procurement choices, such as multi-year renewable PPAs, that could positively impact the energy transition.

2. Corporate power purchases can support change

Consumers do not directly control the products that are being produced for them. *However, consumer buying power does inform producers of what is in demand.* Successful producers will recognise that demand and respond to it. Really successful producers are even able to create demand for their products. *Many consumers want to purchase products with a lower environmental impact, or indeed avoid buying products with a high environmental impact. Such demand should encourage producers to tailor their offers accordingly.* Equally, conscientious consumers should be able to state that they are reducing their individual emissions in this way.

Because electricity is not a tangible product that can be packaged and physically transported between producer and consumer, a book-and-claim mechanism is needed to allow the trade of specific units of energy. Such systems allow producers to 'book' the attributes of a given MWh of power when it is injected into the grid in the form of an energy attribute certificate (EAC). Those EACs can then be transferred to a customer, who then 'claims' them as proof that they paid for a given type of electricity. Power is a charge that must be maintained on a grid and not an entity that can flow through grids from producers to consumers. EACs, in contrast, can be packaged and delivered from a producer to a consumer, via an intermediary if needed.

By acquiring and cancelling EACs, corporates can measure what proportion of their total energy consumption is covered by renewable generation. Thanks to the specific information included on EACs, corporates can also measure the impact that their purchases may have on the energy transition. EACs specify, *inter alia,* where the power was generated, using what technology, the age of the generation device, and, increasingly, the time the energy was produced. *The information EACs provide to consumers is the basis on which the impact of an energy purchase can be evaluated.* Debate can be had over the environmental impact of different energy procurement practices, and some are certainly more impactful than others. However, any healthy debate must be informed by reliable information – such as that provided by EACs.

Criticism of some renewable energy products, because of the production technology or type of contract should not be confused with criticism of EACs as a market-based mechanism for paying for and claiming the use of renewable energy. The GHG Protocol Scope 2 document should continue to guide corporates on how to report their energy use, not dictate to them as to the *type* of energy they should use. In this way, the GHGP scope 2 guidance is foundational. Other reporting mechanisms, which build from this guidance can and do set criteria for what energy purchases qualify as impactful under their criteria.

In addition to providing a market signal for the production of more renewable energy, corporate energy purchases can, and should, also put pressure on competing companies

who are not making the same effort to reduce their environmental impact. When EACs are bought and cancelled, those attributes are removed from the market, leaving the remainder, the residual mix, as a more polluting 'bucket' of energy. Corporates who are only buying power and not specific energy products through related EACs have to buy from this 'dirty bucket' and thereby face more pressure to make the switch to less polluting energy sources as proven through EACs. This adds to the consumer demand for renewable energy and further encourages producers to offer such products over fossil fuel power.

3. Distinctions between EACs must be considered with care

The article discussed above makes the following central assumptions:

> *"…PPAs do lead to additional renewable energy production and real emission reductions, as the long-term power price de-risks new projects and allows access to project finance…"*

and

> *"…RECs [all non-PPA instruments] and similar market-based instruments are non-additional, that is, not leading to additional renewable generation capacity or real emissions reductions…"*

The terminology of PPAs and RECs (Renewable Energy Certificates) is misleading. The more commonly used, and more accurate, terms are bundled or unbundled energy attribute certificates (EACs). Power purchase agreements (PPA) are a catch-all category, commonly applied to any long-term contract for electricity. PPAs can take many different forms and can be used for the purchase of any kind of energy. PPAs are not inherently related to the purchase of renewable energy. ***The only way to prove the purchase of a particular type of energy is to buy and cancel the related EAC – which can either be sold together with the underlying energy (bundled) or separately from the energy (unbundled)[4].***

While the terms 'bundled' and 'unbundled' have had qualitative differences projected onto them by some stakeholders, these distinctions are largely irrelevant to the associated income received by the electricity generator. ***To this end, whether EACs and their underlying power are sold together or separately makes no fundamental difference to the impact renewable electricity markets can have on the energy transition***. If consumers are buying EACs for renewable electricity, they are providing an income stream to renewable electricity producers. Whether any of this income is then invested in the building of new renewable generation capacity is subject to several factors that are not inherently related to the contractual form used to sell the energy and/or its attributes.

Even within the use of bundled contracts, distinctions can be made as regards impact (see

graphic). Therefore, while some stakeholders may draw distinctions between the buying and selling of energy bundled or unbundled with energy attribute certificates, such distinctions should be considered with care.

4. Additionality is a complex concept

The authors of the article highlighted above cite the ability of any energy purchase to drive the development of new renewable energy generation as being the core basis on which to judge its impact on emissions reductions. Without additionality, according to the authors, there are no emissions reductions. While the simplicity of this argument may be appealing, there remains a level of complexity that must not be ignored.

The demonstration of additionality, as the authors point out, is complicated and often contested. This is partly because additionality is viewed as a binary concept. An energy purchase either has an additional impact or does not. The classic example of an energy purchase that is additional is as follows:

- ⇒ A renewable energy developer approaches a large consumer and asks: if we build 100MW of capacity, will you buy the generation through a long-term PPA?
- ⇒ The large consumer says yes, and to facilitate the development we will sign an MoU (memorandum of understanding) agreeing on the principles of such a deal.
- ⇒ The developer takes such an MoU to the bank and uses it as the basis for favourable financing conditions for the borrowing needed to realise the development.
- ⇒ The development is built, and the energy is generated and sold through the PPA set out in the MoU.

The above does indeed set out the conditions for an impactful energy purchase. But there remain other macro and micro economic and political factors that influenced the viability of this development. Total costs could be reduced by the cost reductions in renewable energy technologies such as wind and solar power. Labour force availability could be increased by government employment and apprentice programmes. Local planning decisions could influence site availability and access. Fiscal policies could influence the profitability of the development. Grid development and management policies could influence production capacity and curtailment rates. ***The list goes on and the point holds that no single aspect of a renewable energy development can alone flip a 'go / no go' switch, even in the classic example of additionality set out above.***

Instead of a binary concept of additionality, renewable energy purchases should be viewed on a spectrum of impact. Such an approach initially acknowledges that any purchase of renewable energy is more environmentally beneficial than a purchase of generic 'commodified' power. It then acknowledges that distinct types of energy procurement can have different benefits and that any evaluation of these benefits, being both objective and subjective, will be different to different stakeholders. ***Importantly, rather than categorising renewable energy procurement between additional or non-additional, this view of impact emphasizes the distinction between consumers who are doing something to be impactful and those who are doing nothing.***

However impact and additionality are assessed, it is clear that EACs can provide significant financial support to renewable energy producers. In Europe in 2022, well over 800TWh of GOs were issued by AIB member countries[5]. GOs prices in 2022 were stable at around €2MWh for the first half of the year, before climbing to around €10MWh as the market tightened towards the end of the year before re-stabilising at around €6MWh heading into 2023. *The EU GO market therefore provides billions of Euros of income to renewable energy producers. The value of a GO is almost pure profit to producers as they cost little or nothing to obtain. This profit can, and in RECS' view should (given the strong market signal from consumers), be invested into more renewable energy generation. Such investment in new renewables accelerates the energy transition and displaces fossil fuel power generation – cutting overall EU GHG emissions.* With developers increasingly able to self-fund new renewables thanks to EAC values, governments can focus their support for renewables on newer technologies and/or on generation in more challenging locations. *A recent report for the Dutch government makes this clear, stating that the value of guarantees of origin is an important factor in determining whether positive investment decisions can be made for offshore wind projects since the Dutch government no longer provides financial support for such projects.*[6] Furthermore, the market-based approach has enabled the development of a comprehensive legislative and regulatory framework in Europe that incentivises companies to contribute to the energy transition through their consumer choices.

Therefore, in RECS' view, Renewable energy markets based on EACs clearly support additionality, help to accelerate the energy transition, and cut emissions by displacing fossil fuels. Every purchase of renewable energy attributes provides some degree of additionality. As such, consumers making the additional effort of buying renewable energy should benefit by being able to reduce their scope 2 emissions.

5. Unbundled EACs have a role to play

The authors of the article highlighted above are particularly sceptical of the impact that the trade of unbundled EACs can have on additionality and, by extension, emissions reductions. Broadly, the authors say that energy procurement that is additional, which they assume to be the case for PPA-based procurement, leads to emissions reductions. The purchase of unbundled EACs is, for the authors, non-additional and therefore does not lead to any emissions reductions. So, what is the difference between bundled and unbundled?

When the EAC and underlying power are traded in a contract together, it is described as 'bundled,' a term which originates from US REC (Renewable Energy Certificate) markets. When the EAC and underlying power are traded in separate contracts, it is described as 'unbundled.' In either case, the principles remain unchanged and a producer who can have their power certified with an EAC can benefit from the income of two product streams: 1. the physical power, and 2. The underlying attributes, as represented by an EAC.

5 https://www.aib-net.org/facts/market-information/statistics/activity-statistics-all-aib-members
6 https://www.rijksoverheid.nl/documenten/publicaties/2020/03/05/the-business-case-and-supporting-interventions-for-dutch-offshore-wind

As is set out in more detail in RECS' guidance for market participants[7], all contracts for power and/or for attribute certificates rely on clearly defined and regulated systems and markets. Therefore, ***no contractual form is inherently more reliable than any other. Equally, no contractual form is inherently more impactful than another.*** The socio-economic impact of buying renewable electricity depends on how much money flows from the consumer to the producer and the signal it provides for the building of more renewable power.

Why would some producers offer unbundled EACs for sale if it did not benefit them? Could they want the flexibility to sell their power and EACs separately to make the most of different dynamics in the different markets? The overall aim is to produce more renewable energy and, thereby, cut total GHG emissions as quickly as possible. ***There are many ways that renewable energy production can be supported, one of which is giving the producers the freedom to sell their products in the form that makes the most sense for them as rational economic actors.*** If that means renewable energy developers and producers want to offer unbundled EACs, then an academic argument against the use of such instruments seems moot.

Even if the buyer's perspective is considered, the role of unbundled EACs can still be viewed positively. ***Unbundled EACs enable broad-based consumer participation in the energy transition – particularly from the small and medium sized enterprises (SMEs) in corporate supply chains. If the market-based approach were confined longer-term bundled contracts it would be limited to those companies with the institutional capacity to conclude such agreements.*** SMEs typically do not enter into PPAs, certainly not of the type that can underwrite new renewable developments. Without unbundled certificates such SMEs would be dependent on their power supplier, who may or may not engage in green power procurement. ***Unbundled EACs allow all consumers to support the energy transition through their energy procurement. This in turn helps to balance the supply and demand of renewable energy, thereby helping to maintain an equilibrium price which can support further investment in renewables.***

The failings of location-based reporting mechanisms

In addition to noting the value of market-based methods of accounting for scope 2 emissions, it is also important to understand the failing of location-based emissions accounting. First, it is inherently imprecise. Second, it allows companies to make emissions reductions claims that they did little or nothing to support. Third, it provides no individual incentive to act. Forth, it allows for double counting of the renewable attributes of a given unit of energy.

Each of these three points is examined in more detail below.

1. Inherent imprecision

Location-based reporting reflects the average emissions intensity of the local grids on which energy consumption occurs. It is calculated by multiplying an individual's or

7 https://recs.org/news/recs-international-publishes-guidance-for-market-participants/

organisation's total electricity consumption in MWh by the average emission factor on the grid they are consuming from. This seems simple but the devil is in the detail. For example, *if a consumer uses electricity at night or when there is no wind they can still claim the average emissions factor for the total grid mix regardless of what technologies were producing power at the time they were consuming it.* This is a criticism often directed at market-based reporting, but it also applies to location-based reporting.

Furthermore, there can be many interpretations of what the grid mix is because *the Scope 2 Guidance does not give clear boundaries of the territorial unit to consider when using the location-based method.* Europe, for example, has an internal energy market and almost all members of that market are highly physically interconnected via the grid. However, the national electricity production mix can vary widely from almost 100% renewable in some countries to almost 100% fossil-based in others*. There is a clear incentive for corporates to use the most favourable grid mix available to them regardless of how accurately it reflects their consumption.* This situation has a further complication that if some corporates are reporting on national grid mixes, and others on regional mixes, then some of the attributes of the electricity generation are being double counted.

2. Benefits without commitments or contributions

Location-based reporting does not solve the concern that corporates can claim the benefits of a more renewables-based energy system without making commitments that specifically support those positive developments. Indeed, a corporate may just be buying the cheapest possible power available to them in order to maximise profits and may also be doing their utmost to reduce their fiscal contributions to the tax jurisdiction in which they are based. While doing so, if the public and other locally tax paying corporates have funded a generous public support scheme for new renewables that reduces average grid emissions then everyone can benefit from 'greener' location-based reporting data, whether or not they are committed to, or have directly contributed to, the energy transition.

Location-based accounting also has the drawback that corporates can account for emissions reductions at the grid level that are unrelated to their procurement practices and investments.

3. No incentive to act

As shown above, location-based reporting allows corporates to benefit from a lower grid emissions factor while providing little or no support to the technologies helping to cut those emissions. The corollary of this problem is that it reduces the incentive of organisations to act individually to support renewables through its procurement policies. Only the market-based mechanism gives corporates the recognition of actively buying renewable energy. *Under the location-based system a corporate might be making the most impactful purchases of renewable energy possible, but they would only benefit in the same way as all other electricity consumers on the same grid.* This disincentivises any renewables-specific energy procurement and risks cutting off an important income stream for renewable energy producers.

Stakeholders who support location-based reporting sometimes suggest that it incentivises corporates moving to countries or regions with lower grid emissions factors. However, as

shown above, these factors can be 'gamed' to some extent – reducing the need to move to the most renewables-heavy grids. ***Also, it assumes that corporates give more importance to their emissions reporting than may be the case in reality.*** There are huge factors in the siting of corporate assets including tax regimes, labour force availability, planning laws, and infrastructure capacity. The idea that *voluntary* emissions reporting, even from the most committed of corporates, could outweigh these other factors does not seem credible.

4. Institutionalised double counting

Allowing the use of the location-based method at the same time as the market-based method can quickly lead to institutionalised double counting. Under the dual-reporting regime, all companies should be reporting their scope 2 emissions calculated using ***both*** the location-based and the market-based accounting methods. This means that the same attributes are being counted in two different ways and are thereby being counted twice. For example, if 'Company A' is reporting zero scope 2 emissions because it covered all of its power consumption using Norwegian GOs, while 'Company B' is reporting almost zero scope two emissions because it consumed power in Norway, which is almost 100% renewable (hydro), without buying the related GOs, then double counting of some or all of those attributes has occurred.

RECS understands from its members that this double-counting is made worse by corporates often choosing whether to calculate their scope 2 emissions using either the market-based or location-based method, rather than using both. This makes the double counting more difficult to detect because any comparison of the two accounting methods becomes impossible.

The next step for location-based scope 2 emissions reporting

No human-developed system is perfect, including the measuring and reporting of scope 2 emissions via either the market-based or location-based methods. However, market-based reporting is proving its worth. As EAC markets mature and bring supply and demand into equilibrium, market-based mechanisms that support renewable energy clearly support the overall energy transition. Location-based reporting on the other hand suffers from a number of significant drawbacks that should be considered in any revisions of the GHG Protocol and its guidance on scope 2 emissions reporting.

For example, the protocol and guidance could provide ***much clearer guidance on the territorial boundaries of a consumer's grid and the related emissions factors that can therefore be reported. RECS believes that the grid emissions factor should encompass the full interconnected grid (e.g., all interconnected European internal energy market countries) from which a consumer's power could come.*** Doing this would prevent cherry-picking of a definition of 'location' that best suits the reporting entity's needs and should be instituted, especially if there is no market for energy attribute certificates and thereby no possibility to use the market-based method. However, where a renewable energy market based on EACs is in place, this measure would not address the problem of double counting of attributes described above.

By putting market-based reporting and location-based reporting on an equal footing the GHG protocol and guidance are institutionalising the double counting of renewable energy

attributes. Two different methods of counting attributes logically lead to attributes being counted twice. Therefore, in countries or regions where a market-based energy attribute certificate system is in place, RECS makes the following:

1. *The measuring and reporting of attributes using the location-based method should only be done to provide indicative information* on the attributes of total energy generation in that location. It should not be used to report a corporate's scope 2 GHG emissions under the protocol.
2. *If a corporate is not actively buying EACs to cover their energy consumption, they should report the residual mix for that location.* In some locations this may require the development of residual mix calculations. While Europe has a robust and long-standing residual mix, other countries with renewable energy markets are still developing their residual mix methodologies, including some I-REC market countries.

In order to have an accurate understanding of a corporate's scope 2 emissions and to avoid any double counting of renewable energy attributes, RECS supports downgrading the use of location-based accounting wherever an EAC market is in place.

The next step for advanced EAC schemes

This paper strongly rejects the repetitive criticism set out above of EACs and market-based mechanisms for measuring and reporting scope 2 GHG emissions. Nevertheless, RECS does support the ongoing development of EAC schemes to make them as efficient and impactful as possible. *In RECS' view, the next step for advanced EAC schemes like the European guarantee of origin is total market transparency through full disclosure and GHG values on EACs.*

Total market transparency through full disclosure and GHG values on EACs

EACs are not inherently limited to renewables and can document the attributes of any type of electricity. Where this is done, it is called 'full disclosure' and can bring total transparency to energy markets. *RECS strongly supports the use of full disclosure because it requires all power consumers to prove the origin of all the power they consume – ensuring a level playing field between renewable and non-renewable electricity sources.* Currently, end-users willing to consume renewable electricity must go through the process of acquiring and cancelling EACs while consumers of non-renewables face no such requirements when consuming the residual mix[8]. *RECS asserts that if all end-users have to actively purchase energy attributes and prove the origin of their electricity consumption, end-users will be more aware of where their electricity comes from – encouraging them to buy renewables.*

Legislators and regulators should see clear benefits in full disclosure schemes. They provide total transparency of the energy being produced and consumed, MWh by MWh. This clarity

8 The residual mix is the grid attribute (emission, radioactive waste, etc.) average that is not allocated to a specific individual or end-consumer. If a consumer uses grid electricity without the cancelation of a GO certificate (or other reliable tracking mechanism) then they are obligated to use the residual mix when calculating/reviewing their consumed electricity attributes (footprint).

can enhance the implementation of energy policies and the tracking of targets. As stated above, full disclosure should also facilitate more conscientious energy buying, and provide more motivation to buy renewable energy over fossil fuels. This should add to the income for renewable energy producers allowing public authorities to redirect (not reduce) their renewable energy support budgets to emerging technologies and/or current technologies in areas where their development is more economically or practically challenging.

There are two principal ways of implementing a full disclosure scheme: Full Production Disclosure and/or Full Consumption Disclosure.

Full Production Disclosure (FPD)

Every producer must or may receive a certificate for every MWh of power they put on the grid, regardless of the generation technology used. FPD makes certificates available for all generators which simply means that every MWh is certified without specifying what must happen with that certificate.

Full consumption disclosure (FCD)

A certificate must be cancelled for every MWh consumed and, therefore, no claims can be based on the residual mix. With all end users having to prove the origin of the power they use there is complete transparency on electricity consumption and a level playing field for those using renewable or non-renewable electricity since every MWh (renewable or not) must be claimed through the same system. Within an FCD system, different market participants can be responsible for cancelling energy attribute certificates. For example, consumers can mandate suppliers to cancel certificates on their behalf (See 'full supplier disclosure').

RECS' View

RECS believes that renewable energy markets are proving their worth, and that wherever such markets are in place, the market-based approach to scope 2 emissions reporting should take precedence. If, in these countries, location-based reporting remains possible, it should be downgraded to an indicative reference number. Location-based reporting should only be used as a definitive account of a company's scope 2 emissions if no EAC market is established in the area of their energy consumption. Indeed, EU law states that GOs are the sole means of demonstrating to final customers the share or quantity of energy from renewable sources in an energy supplier's energy mix. If this is the standard that applies between European energy suppliers and their customers, why should it not be the standard that applies to corporates reporting their scope 2 emissions?

RECS also supports the use of full disclosure regulations to further develop advanced EAC schemes because it requires all power consumers to prove the origin of all of the power they consume. We believe if all end-users have to actively purchase energy attributes and prove the origin of their electricity consumption, end-users will be more aware of where their electricity comes from – encouraging them to buy renewables. ***RECS International advocates for the use of full consumption disclosure systems, supported by provisions for end-users who want to mandate their supplier (an entity that supplies either power and/or EACs) to cancel certificates on their behalf.*** Full production disclosure can be seen as a

prerequisite for a full consumption disclosure because the EACs have to be available for consumers to acquire and cancel them.

Importantly, as regards scope 2 emissions reporting, if every unit of energy consumed has to be certified, then every consumer knows from where the power they have paid for comes. ***If every EAC also carried a GHG value stating the grams of emissions for the MWh of energy, then all consumers would know the emissions value of the energy they have bought.*** This would remove any lack of clarity over the ownership of every unit of energy, or the responsibility for the emissions that are attributed to that energy.

In short, EACs are the only way for energy users to purchase a specific energy product and to make claims based on what they have bought. As such, they must be recognised and respected as the cornerstone of corporate scope 2 reporting. This reporting allows stakeholders to scrutinise corporate energy procurement practices, and, if needed, to call on those corporates to make more impactful purchases. The more global EAC schemes are standardised and harmonised, the more efficient and effective they can become at supporting the energy transition and the easier they will be for all stakeholders to use and understand.