

How to Optimise Your Purchase:

A Buyer's Guide to
Energy Attribute Certificates





Glossary

Emission factor: A factor that converts activity data into GHG emissions data (for example, kg CO₂e emitted per litre of fuel consumed).

Energy Attribute Certificate: An Energy Attribute Certificate, or EAC, is a certificate which provides information about the environmental attributes of one megawatt hour (MWh) of electricity¹. Renewable generators produce electricity which has emitted low or zero carbon during its creation. EACs label the electricity as 100% renewable, enabling companies to demonstrate support for renewable energy generation, meet their renewable energy targets, and report zero carbon emissions for their energy use.

GHG Protocol Scope 2 Guidance: Guidance released in 2015 as an addition to the Greenhouse Gas (GHG) Protocol, pertaining to how companies may address their Scope 2 emissions. It stipulates that organisations may purchase EACs from renewable sources to match their electricity, steam, heat or cooling emissions and may consequently claim a zero-emission rate for their electricity. It provides a set of requirements (quality criteria) that contractual instruments shall meet in order to be used in the market-based method for Scope 2 accounting.

Green-e Energy: Green-e Energy certifies renewable energy sold to consumers and businesses in North America that want to reduce the environmental impact of their electricity use.

Grid mix: This refers to the mixture of energy source types feeding into a national or sub-national electricity grid, and is expressed in percentage terms, whereby x% of grid electricity originates from coal, x% from gas, x% from solar, x% from wind, etc.

Reconciliation: Many companies choose to purchase most of the EACs required to cover their electricity consumption earlier in the year. They then reconcile at the end of the year (also referred to as “truing up”), either by purchasing more EACs or by carrying over EACs into the next year, if applicable, depending on actual consumption.

Reporting Year (RY): The year-long period over which sales of Green-e Energy certified renewable energy are reported to the Center for Resource Solutions (CRS) for verification.

Residual mix: This refers to the mixture of energy source types feeding into a national or sub-national electricity grid, after retiring EACs from renewable sources. The residual mix can provide an emission factor for companies without contractual instruments to use in a market-based method calculation.

Tracking System: A database or registry that helps execute EAC issuance and cancellation between account holders in the system. It can track information on certificates or generation occurring throughout the defined system. They are typically tied to geopolitical or grid operational boundaries².

¹ Or one kilowatt hour (KWh) of power generated from green gas for Scope 1 emissions.

² GHG Protocol Scope 2 Guidance, 2015. Available at: http://www.ghgprotocol.org/sites/default/files/ghgp/standards/Scope%20%20Guidance_Final_0.pdf

Introduction

Natural Capital Partners delivers a wide range of renewable energy solutions to meet our clients' requirements for high quality, global Energy Attribute Certificates (EACs) which match their consumption. Companies can customise their solution by selecting EACs from around the world based on proximity to consumption, technology, age of the power plant, vintage of the electricity, and more. Prices can vary according to these factors, but also according to the time of year purchases are made, which is primarily due to the timing structure set by the main EAC standards.

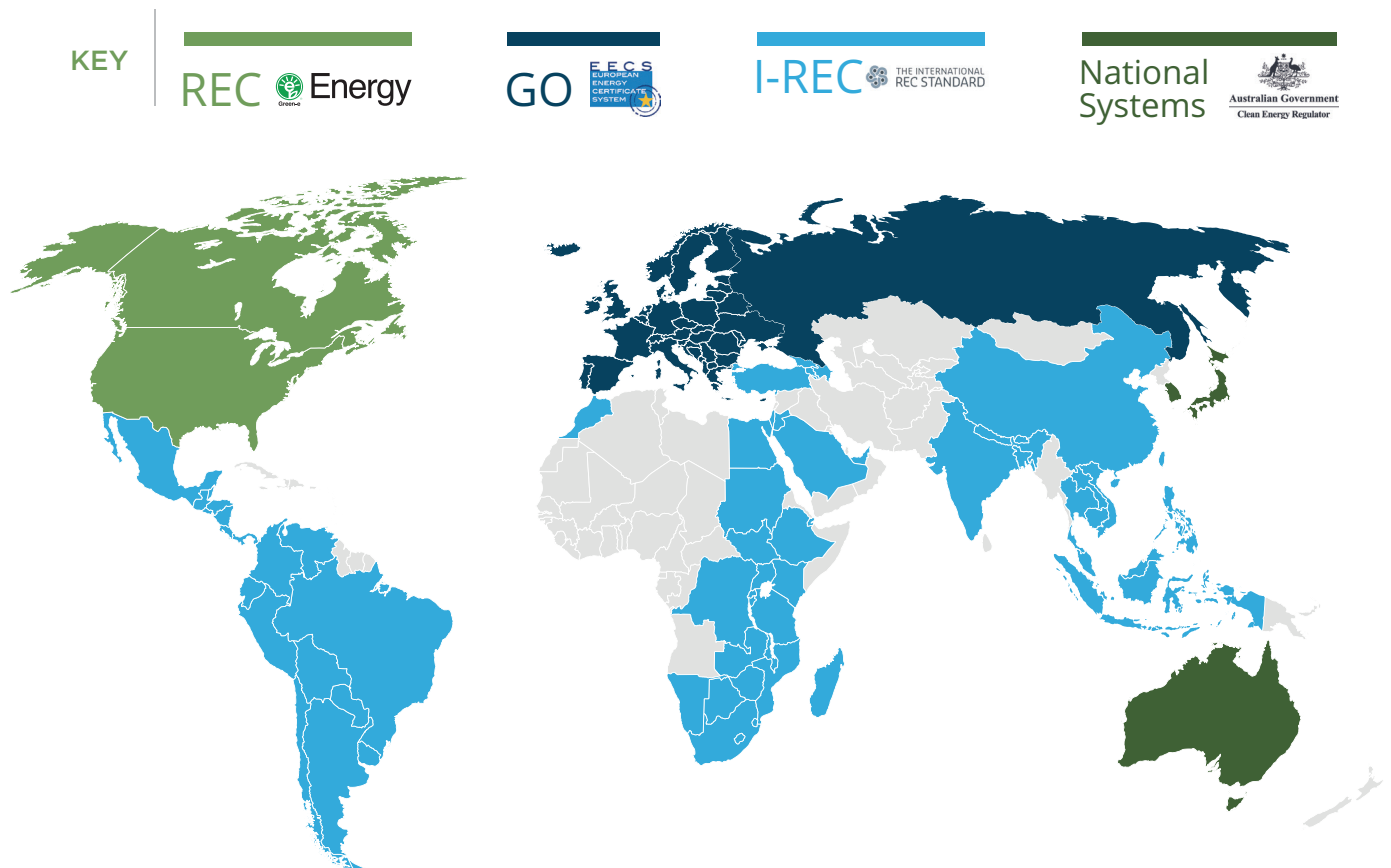
This paper describes the design aspects of EAC tracking systems that influence corporate buying decisions including Renewable Energy Certificates

(RECs) in North America – which are primarily governed by Green-e Energy – Guarantees of Origin (GOs) in Europe, and International RECs (I-RECs) across the rest of the world.

EACs underpin the >500 million MWh of renewable energy sold globally each year and continue to be favoured by companies with 100% renewable energy goals, with 85% of U.S.-based RE100 companies and 60% of RE100 companies with operations across the rest of the world using EACs to achieve their renewable energy goals³.

This paper provides guidance related to the optimisation of EAC sourcing to help companies in any location get the most value from their purchases. Key recommendations are summarised at the end of this document.

Figure 1: Energy Attribute Certificates Available Around the World





Design aspects of the Green-e Energy programme that influence buying decisions

Green-e Energy maintains the [Green-e Renewable Energy Standard for Canada and the United States](#) (formerly the Green-e Energy National Standard), which is updated regularly. Under the standard, Green-e Energy specifies that a *“Green-e Energy certified product may include only renewables that are generated in the calendar year in which the product is sold, the first three months of the following calendar year, or the last six months of the prior calendar year.”* This design aspect of the Green-e Energy programme meets the vintage quality criteria of the GHG Protocol Scope 2 guidance that seeks to ensure temporal accuracy of Scope 2 calculations, namely that the generation occurs close in time to the reporting period for which the certificates are claimed.

Green-e Energy also annually publishes Residual Mix Emissions Rates. These are CO₂ emissions rates that should be used for electricity consumption and that are not associated with an EAC or *“for which a more specific set of emissions data is not available.”* These rates are compatible

with the GHG Protocol Scope 2 Guidance (see [2018](#), [2017](#) and [2016](#) Residual Mix Emissions Rates). Rates are derived using the data collected by Green-e Energy during annual verifications of certified sales. This is in addition to the most recent emissions and generation data provided by [eGRID](#) in the U.S. for each [NERC](#) region and provincial emissions data in Canada drawn from Statistics Canada and Environment Canada. Using a more specific or accurate emissions rate (for example, from a supplier or from a certificate tracking system operator such as NEPOOL-GIS: New England Power Pool Generation Information System, or PJM GATS: PJM Generation Attribute Tracking System) is preferable to using Green-e Energy, eGRID or provincial emissions data. However, using Green-e Energy Emissions Rates are preferable to eGRID or provincial emissions data for the reason that this approach results in a more accurate characterisation of your residual mix emissions for the purposes of Scope 2 accounting. This is because the Green-e Energy Residual Mix Emission Rates account for the renewable energy claims made under the Green-e Energy programme, leaving a higher emission rate in the residual mix.

Green-e Energy requires all marketers maintaining certified products to submit a third-party audited report for the prior Reporting Year (RY) by June 1st in the following Reporting Year. June 1st is generally considered the absolute end of the prior RY trading period. For instance, Reporting Year 2018, sometimes abbreviated to RY18, would include all sales of Green-e Energy certified products applicable to customer sales in calendar year 2018, and marketers would need to submit audited documentation to Green-e Energy by June 1st, 2019. Audited documentation includes a checklist of items, such as sales contracts, purchase contracts, retirement reports and other delivery documents, invoices, and other materials as required under the then-applicable process audit protocol.

Both retroactive and forward purchasing are completely acceptable under the Green-e Energy programme, however some key dates apply when purchasing retroactively. Using RY18 as an illustrative example, a customer can theoretically purchase Green-e Energy certified RY18 Renewable Energy Certificates (RECs) anytime on or before June 1st, 2019: the absolute end of the RY18 trading period. In practice however, as the June 1st, 2019 date approaches, marketers have submitted documentation to auditors and incorporating new purchases becomes more challenging and potentially costly. Ideally, all retroactive purchases, including annual "true-ups", are completed well before the June 1st deadline. Market players that sell Green-e Energy will likely start the audit process in March or April, so a retroactive purchaser should commit to a purchase no later than the first quarter of the following year.

Green-e Energy programme design allows for customers that purchase and report EACs for a variety of purposes and programmes. Buyers may purchase EACs to cover their calendar year or fiscal year consumption. Green-e Energy does not have any requirements for matching a consumption period to a generation period - those decisions are up to the customer. Green-e Energy Reporting Years are designed for auditing certified products based on the date that the product is sold by a marketer.

As part of Green-e Energy's consumer disclosure process, Green-e Energy certified marketers (for example, organisations such as Natural Capital Partners) provide customers with a Prospective Product Content Label upon sale of a Green-e Energy certified product. No later than August 1st each year, Green-e Energy marketers are required to provide customers with a Historic Product Content Label that reports on the specific mix and location of RECs provided to customers during the prior Reporting Year.

Beginning July 1st, 2018, all Green-e Energy certified EACs must be registered and tracked on an approved registry. End-use consumers are not required to maintain a registry account, however all Green-e Energy certified products must be retired within a marketer's registry account. In most cases marketers may retire for an aggregated number of purchasers. However, if as a consumer you would prefer to have the marketer (for example, Natural Capital Partners) provide you with a retirement report in conjunction with your Historic Product Content Label or before, you should specify this in your EAC agreement with the marketer.



Design aspects of the GO tracking system that influence buying decisions

The European Union (EU) shapes electricity policy for member countries. Under the EU Directive which promotes the use of renewable sources, each member state must be able to guarantee the origin of electricity, heating and cooling from renewable energy sources. The Guarantee of Origin (GO) is the main electricity tracking instrument for Europe. Each European member state is mandated by law to have a national GO certificate system to track proof of electricity origin. One GO equals one MWh, and GOs can be purchased either combined with, or separate from, the physical power.

Each European member state has a GO issuing body which is responsible for designing and implementing its national GO system. In order to standardise national rules for GOs, the European Energy Certificate System (EECS) was created by the Association of Issuing Bodies (AIB), representing 20 national GO issuing bodies. Nations that are members of the AIB and adhere to the EECS system are easily able to trade GOs cross-border with no risk of double counting, claiming or attributing.

When most stakeholders refer to the GO voluntary market, they are referring to the standardised EECS-GO market, which currently consists of 20 member states. A number of individual member states have national GO schemes, but have not joined EECS, the largest of these being the GO system in the United Kingdom.

GOs prove the origin of electricity and contain only factual information about the production site of the originating electricity. The information contained in GOs is normalised and recognised in all member states, and is used to provide buyers with information on electricity sources. This provides a reliable disclosure system that enhances competition in the energy market by providing increased consumer choice.

All international trades of GOs go through the EECS. The quality assurance of the GO scheme is embedded in the GO itself and its traceability through the EECS. Each GO is issued with a serial number, is unique to that MWh, which traces

the GO from creation, to issuance, transfer, then cancellation, ensuring a robust system which meets the criteria of unique claims and cancellation.

Various design aspects of the EECS system which are common to the 20 national members influence buying decisions, including the GO lifecycle, registry infrastructure for imports and exports, as well as GOs and public funding for renewables.

GO lifecycle: The lifecycle of a GO with an EECS Certificate encompasses three phases: issuance, transfer and cancellation. The way in which a certificate flows between these three major states is shown in Figure 2. Once issued, the majority of GOs are transferred and then cancelled within a registry on behalf of an end-consumer. The end-consumer is the beneficiary of the renewable attributes, which no longer flow to the grid, and the residual mix is adjusted to reflect this. Figure 2 illustrates two other states: Withdrawn for certificates that have been issued in error; and Expired. The validity of a GO expires 12 months after issuance. Certificates that have not been cancelled by this deadline are expired automatically, at which point their attributes flow into the grid and are reflected in the residual mix.

Figure 2: Guarantee of Origin Lifecycle

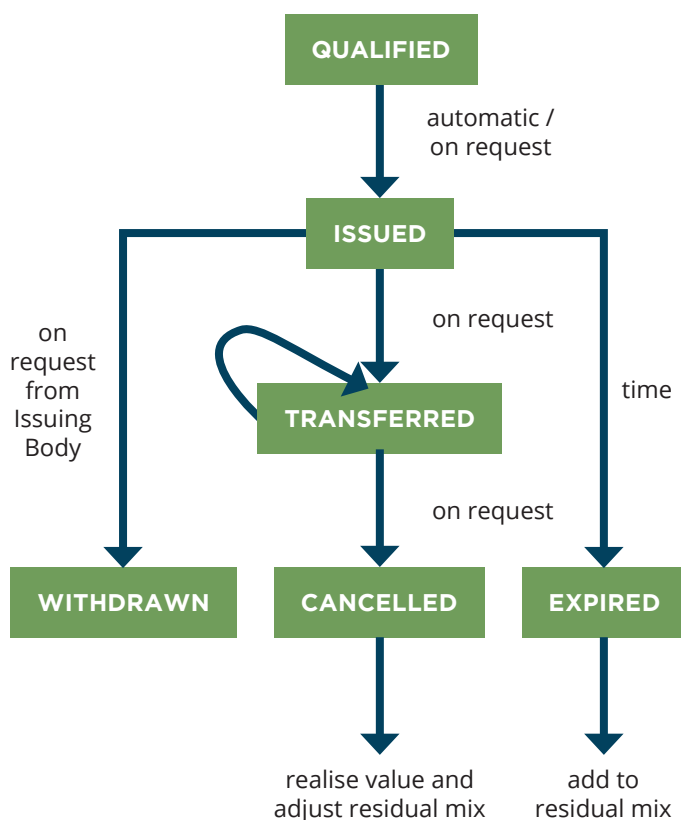
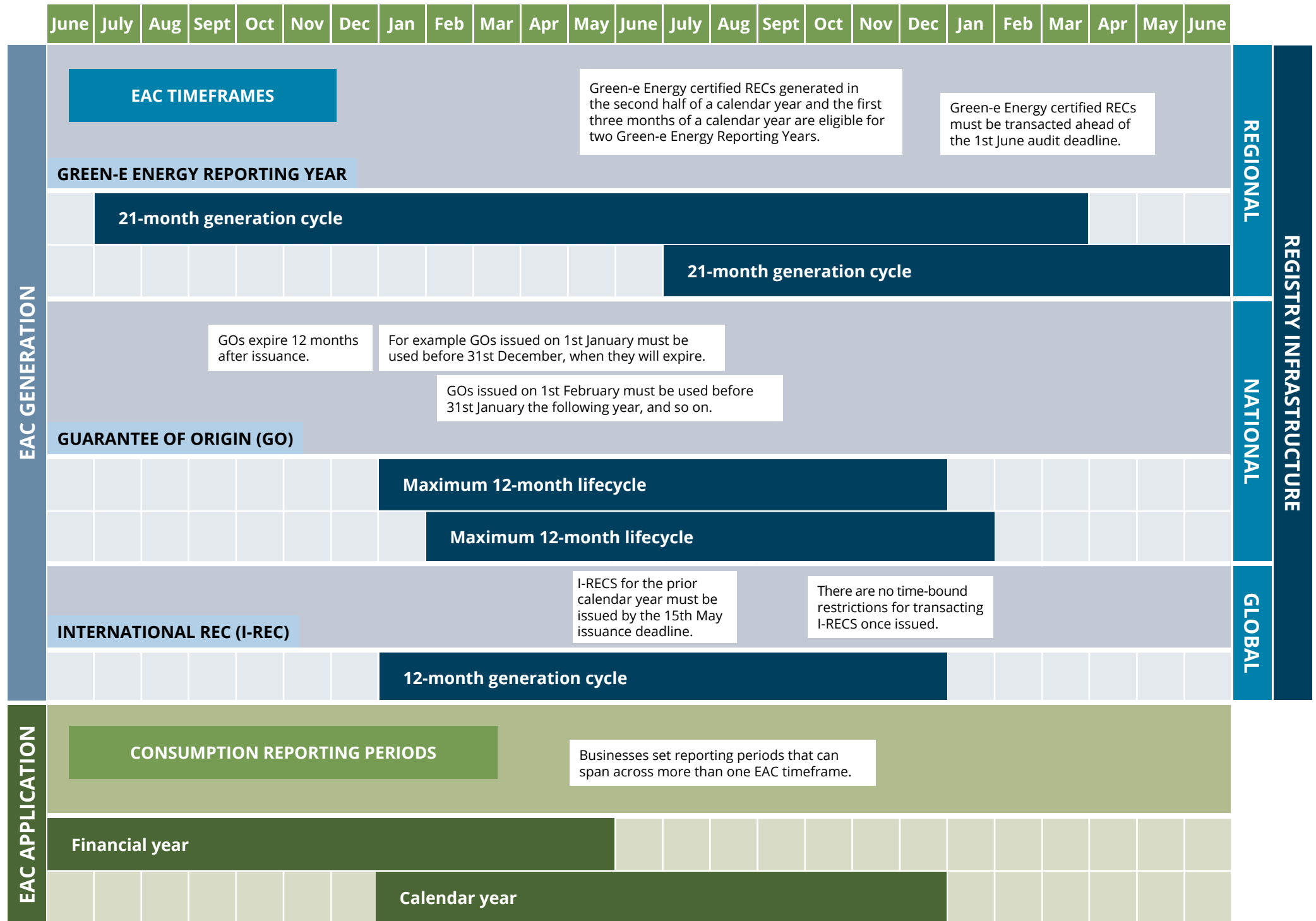


Figure 3: Energy Attribute Certificate Timeframes





Ignoring the effect of GO cancellations, the pool of available GOs for 2018 will be greatest at the end of December 2019. At the end of January 2020, the January 2019 issued GOs will expire and so on until it is no longer possible to source 2019 GOs. Due to this finite GO lifecycle and reducing availability, corporates are well served to purchase GOs sooner rather than later for any given reporting year.

Registry infrastructure for imports and exports:

Each country appoints a GO registry to manage the electronic data flows necessary to operate the GO scheme. Each of these local registries is interconnected with a centralised EECS hub database. This central interconnection facilitates the export and import of GOs to the country of consumption to ensure that all of the data needed to accurately calculate the impact on residual mixes of GO cancellations is made available.

The GHG Protocol Scope 2 Guidance recognises that the EU is a multi-country market united by a set of common market rules and regional connection, making the EU a geographical market boundary from which certificates can be purchased and claimed for an operation's Scope 2 account and reporting. The guidance notes that where multiple countries or jurisdictions form a single market, a consistent means of tracking and retiring certificates, and calculating a residual mix, needs to be present in order to prevent double counting of

GHG emission rates among electricity consumers. The EECS provides this consistency.

Registry operators set the fee structure for GO issuance, transfer and cancellation and implement rules relating to which entities can operate registry accounts. While there is general alignment between the registries, there is variation and a number of outliers that buyers should note. For example, in Germany, only electricity suppliers are allowed registry accounts and it has to be an end-consumer's physical electricity supplier that handles the GO cancellation. For a multinational company that has centralised EAC procurement away from the German operations, it is critical that the service provider managing the GO transaction has access to the German electricity supplier in order to affect the local GO cancellation. The situation is similar in Ireland.

GOs and public funding for renewables:

A number of member states, like Germany and Ireland, have chosen not to issue GOs when a subsidy is paid for the generation of renewable electricity. This situation arises in some markets due to Article 15.2 in the European legislation 2009/28/EC which states: *"Member States may provide that no support be granted to a producer when that producer receives a Guarantee of Origin for the same production of energy from renewable sources."* In these cases, Germany and Ireland

have responded to Article 15.2 by ruling that production which receives public support (for example, subsidies) cannot also receive GOs. The majority of renewables in Germany and Ireland receive public support, in the form of feed-in-tariffs, meaning they are not eligible to issue GOs. In these countries, the availability of GOs is limited to assets that do not receive public support, which is often hydropower where geography permits, or wind or solar assets that have reached the end of their period of public support. To address consumption in markets like Germany and Ireland where the availability of GOs is very low, or limited to certain technologies, corporate EAC buyers may need to integrate GOs from neighbouring geographies into the EAC portfolio in order to secure cost-competitive supply.

Design aspects of the I-REC tracking system that influence buying decisions

System-wide rules and best practices are applied in every I-REC market to ensure the I-REC tracking system meets the quality criteria of the GHG Protocol Scope 2 Guidance. This common global approach aligns well with the trend we see for renewable energy sourcing responsibilities to be consolidated globally within a corporate function.

From a timing perspective, the residual mix deadline is the most important of these rules. The Scope 2 Guidance establishes that residual mix calculations are necessary for the reliability of EACs and the avoidance of double counting. The I-REC system is designed to support residual mix accounting by establishing a cut-off date for I-REC issuance. After that date, no further I-RECs can be issued for the prior calendar year and issuance data is made available for the purposes of calculating the residual mix.

For the entirety of the I-REC system, the deadline for issuing I-RECs for the prior calendar year will be May 15th of the current year. This means that renewable electricity production that took place in the 2018 calendar year must be included within an I-REC issuance request before May 15th, 2019.

Following the residual mix deadline, no I-RECs will be issued for the previous year's electricity production. The attributes from all issued I-RECs are excluded from the residual mix calculation. Residual mix calculations are typically performed by government entities. For entities wishing to perform this analysis, the I-REC Standard makes issuance data available at a grid level.

Given that the I-REC tracking system is fast developing, the project registration rules are important, particularly if a buyer seeks a volume of I-RECs greater than the volume readily available in the market and new projects are registered to satisfy their demand. A new I-REC project is able to register a maximum of 12 months prior to the current date of registration. However, issuance requests are always subject to the residual mix rules. Following the residual mix deadline (May 15th, 2019) no issuance will be allowed for the previous year in order to secure the attribute statistics of that year. Therefore, issuance requests submitted after May 15th of 2019 will only receive I-RECs for production that took place in 2019.

The I-REC Standard Board views registration as a privilege granted to projects and market players who are working to develop liquid and sustainable markets in various countries and regions around the world. The ability to retroactively register production devices will be reviewed on an annual basis and could change in the future.

The I-REC Standard operates a single global registry through which energy products from renewable sources can be certified through the electricity supply chain. There are no particular constraints relating to I-REC redemption that influence buying decisions. In the interests of transparency, public activity reports on registered I-REC devices may be directly accessed from the registry. Other than for the public reports, all I-REC registry services require an active user account. Corporate end-users are able to operate I-REC accounts, but typically end-users instruct service providers such as Natural Capital Partners to manage their I-REC portfolio on their behalf.

Summary

Forward planning, centralisation and multi-year sourcing

A few simple steps can be taken to deliver a sophisticated global energy attribute certificate procurement strategy for your business. These steps will ensure your business has the widest possible choice of products and achieves optimal value for money.

For optimal purchasing, a business should not wait until the end of a reporting cycle to transact EACs for that reporting period, although many businesses choose to follow this cycle. Businesses often delay transacting EACs until their consumption data has been consolidated by country. For example, a large multinational reporting on a 2018 calendar year may not have consolidated country-level data until March of the following year. The challenge is that by March 2019, EACs generated in 2018 will be in limited supply, which may result in a reduced choice and higher prices.

Therefore, given the timebound limitations that exist within each of the major EAC markets, it is recommended that buyers come to market to buy EACs early in their reporting cycle. Transacting early ensures the best availability of instruments, both in terms of the breadth of projects available and the depth of available volume. Being early to market often results in improved prices and business terms because supply is most abundant at that time.

It is better to conservatively estimate consumption and aim to secure a majority of the requirement early in the period when there is the greatest availability of EACs in the market. Outside of corporate development activity, electricity consumption is relatively predictable and it should be possible to forecast based on the prior period, with adjustments for efficiency programmes and business growth.

Aiming to source 90% of the forecast requirement is a pragmatic approach, as a minor shortfall in EACs is easy to manage. At the end of the reporting period, all the consumption data is known and any shortfall in EACs can then be transacted to achieve 100% renewable energy. It is advised that any shortfall is rolled up into the transaction for the next reporting period to minimise transaction costs. If a business conservatively buys 90% early in the period, over-buying is unlikely. If, however, a surplus of EACs occurs, best practice would be to apply the most recently generated EACs towards the following reporting period. For example, if a business has a surplus of EACs for 2018, it could apply the EACs generated in December 2018 towards the 2019 consumption period. This type of vintage optimisation is consistent within Scope 2 guidance for the generation and consumption periods to be as close as possible.

Centralisation of procurement responsibilities, or having a centrally-defined renewable energy strategy that can be implemented locally to ensure consistency, makes sense for most multinational businesses. Consistency and efficiency are the main benefits of centralisation. When local energy managers are responsible for renewable energy, it will be a lesser priority than ensuring continuity of supply for operations. The renewables activity is therefore likely to become fragmented. The nature of EACs makes it possible for a centralised team to source globally, saving time and aggregating requirements into larger transactions that typically result in improved pricing.

Once under the management of a centralised team, further efficiencies can be realised by moving from an annual sourcing cycle to a multi-year sourcing cycle. Moving from an annual cycle to a two-year cycle halves the work involved in the sourcing effort and doubles the volume of each transaction, which may give greater flexibility as well as improved price security.



Planning and budgeting horizons are specific to each business and tend to be short to medium term, while the horizon for renewable energy targets tend to span the medium to long term. For many businesses, opting for a two to three-year EAC transaction offers the optimal balance of leveraging scale and saving time, without overcommitting the business.

The final recommendation relates to impact and the importance of striving for consumer action to drive change in electricity generation supply over time. The market-based method for Scope 2 accounting represents an internationally-applicable framework allowing consumers to express their demand for specific types of renewable generation. As demand grows and approaches existing supply, it will push up the price of these attributes. In turn, the pressure or incentive to build additional supply grows.

This theory underlines all markets and is playing out as the EAC markets in the US and Europe mature. In these markets growing demand for

renewables is driving up attribute prices as it approaches the level of existing renewables supply. Furthermore, as electricity markets mature they can facilitate sophisticated EAC linked solutions, such as corporate PPAs, that have a direct impact on new renewable supply. Outside these mature markets, there is a critical role for businesses to play in establishing EAC tracking systems, such as I-REC, within new markets. By bringing their demand and working with market participants, it is possible for a business with significant electricity consumption to kick-start a new EAC market. The impact of that action makes it possible for all other consumers on that electricity grid to express their demand for renewable energy: a critical first step in enabling the power of the market-based method for Scope 2 accounting.

Following these pragmatic steps allows a business to seamlessly integrate EACs into its renewable energy strategy, while ensuring it has the widest possible product choice and is achieving the optimal value for money from its EAC purchase.

About Natural Capital Partners

Natural Capital Partners is a world-leading provider of innovative solutions for positive impact on the world's natural capital. With more than 300 clients in 34 countries, the company delivers high-quality solutions for renewable energy, carbon emissions measurement and reductions, water stewardship, building supply chain resilience and protecting biodiversity.

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