Granular Certificate Scheme Standard
Version 1
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THE SPECIALIST DESIGN AGENCY FOR THE ENERGY SECTOR
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Note on Qualifying Language

Note: the guidance *shall* qualify the stringency of statements with the following terms *(RFC 2119 compliant):*

<table>
<thead>
<tr>
<th>Label</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Shall</strong></td>
<td>This word, or the terms &quot;required&quot; or &quot;must&quot;, mean that the definition is an absolute requirement of the Standard.</td>
</tr>
<tr>
<td><strong>Shall not</strong></td>
<td>This phrase, or the phrase &quot;must not&quot;, means that the definition is an absolute prohibition of the Standard.</td>
</tr>
<tr>
<td><strong>Should</strong></td>
<td>This word, or the adjective &quot;recommended&quot;, means that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course.</td>
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<td><strong>Should not</strong></td>
<td>This phrase, or the phrase &quot;not recommended&quot;, means that there may exist valid reasons in particular circumstances when the particular behaviour is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behaviour described with this label.</td>
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<td><strong>May</strong></td>
<td>This word, or the adjective &quot;optional&quot;, means that an item is truly optional. One actor may choose to include the item because a particular marketplace requires it or because the vendor feels that it enhances the product while another actor may omit the same item. An implementation which does not include a particular option must be prepared to interoperate with another implementation which does include the option, though perhaps with reduced functionality. In the same vein, an implementation which does include a particular option must be prepared to interoperate with another implementation which does not include the option (except, of course, for the feature the option provides).</td>
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<tr>
<td><strong>Could</strong></td>
<td>This word, or &quot;can&quot;, implies that the person to whom it pertains has the power to do such a thing.</td>
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Introduction
i. Background

At the heart of EnergyTag is the belief that consumer choice, combined with the right incentives, can be a powerful driver of the technological changes which are necessary to stop climate change. A decarbonised electricity system is probably the single most important tool we have to decarbonise our world, not only because we now have cheap and abundant clean power sources, but also because so many other parts of our lives (e.g. transportation, industry, and heating) can be electrified.

When it comes to choosing where your electricity comes from, the situation is not as straightforward as sourcing physical products such as fruit and vegetables. This is because all power sources are connected to the same electricity network, through which the various sources of electrical energy cannot be physically distinguished, nor can they be physically directed to individual consumers.

For this reason, around 20 years ago, various systems of Energy Attribute Certificates (EACs) were developed around the world so that consumers could ‘choose’ the source of the energy used to produce their electricity. These Certificates track the environmental Attributes of electricity generation using a centralised Registry, which enables the owner of the Certificate to reliably claim the use of that unit of energy generation. They are now well established, and exist in most developed energy markets globally.

This form of disclosure allows for the aggregation of consumer electricity demand by source. Over time, this demand can help foster the development of new (clean) electricity supply facilities that in turn will result in emission reductions across the electricity system. Government programs for supplier regulation, mandatory supplier disclosure requirements, renewable energy promotion programs, and consumers’ greenhouse gas reporting standards have all recognised Certificates and supply disclosure as a key lever in supporting decarbonisation. As more individuals and organisations become interested in sustainability, the use of Certificates has increased dramatically in recent years (e.g. 1,000s of TWh tracked across the world, with developed systems in Europe, the USA, Australia etc.).

Since Certificate systems were first introduced, there has been a massive expansion in renewable energy production in many markets and grids. However, once the share of renewables increases above a certain point, grid integration issues start to emerge, such as the need to curtail renewable energy at times of surplus. Markets also face price cannibalisation, a phenomenon whereby the price of electricity can crash if supply outstrips demand at particularly windy or sunny times of day, which reduces short-term revenues and could impact long-term investments. Increasingly, the question is not simply ‘how do we install more renewables?’, it is ‘how can we manage the energy system so as to maximise the positive impact of renewable energy and drive system decarbonisation?’.

By helping consumers concentrate their energy consumption at times when renewables are abundant and providing incentives for the technologies needed to provide clean energy around the clock, EnergyTag seeks to leverage consumer demand to help answer this question. Some ambitious organisations have already set targets to procure clean electricity in the same hour and on the same grid to match all of their consumption (i.e. 24/7 Carbon-free electricity targets). In December 2021, President Biden signed an executive order stating that the US Federal Government, which is the world’s largest electricity buyer, will purchase “100 percent carbon pollution-free electricity (CFE) by 2030, at least half of which will be locally supplied clean energy to meet 24/7 demand.”
Recent research from Princeton University, the Rocky Mountain Institute and Columbia University has demonstrated the benefits of hourly Carbon Free Electricity (CFE) strategies over annual approaches in boosting clean energy integration and deep grid decarbonisation. EnergyTag encourages more research in this emerging field in order to ensure increasing alignment between consumer sourcing actions and system-level decarbonisation.

Despite these benefits and ambitious targets, it is currently not possible for energy consumers to choose the source of their energy on an hourly basis, as current EACs are not time-stamped. This is the problem that EnergyTag is seeking to address by establishing and building a market for Timestamped, or ‘granular’ energy Certificates (GCs) that enable (sub)hourly consumer electricity source choice. GC markets that address the temporality of renewable supply, would bring benefits such as the opportunity to improve public perception of clean energy claims, better matching of clean energy supply and demand, enabling more granular carbon accounting methodologies and creating an additional price signal for grid decarbonisation technologies such as energy storage. Moreover, GCs could also be used to help buyers displace carbon-emitting generation at specific times and locations to maximise Avoided Emissions.

The first step of establishing this market is to provide a set of common standards and guidelines for the lifecycle management of Granular Certificates so that they may become a recognised, robust and trusted instrument. That is what EnergyTag seeks to achieve by publishing the following two documents:

**Document 1: EnergyTag Standard for Granular Certificate Schemes**
This document provides a first version of the Standard that those implementing Granular Certificate Schemes need to meet in order to prove, through a third party audit, that they are “Compliant with the EnergyTag standard”.

**Document 2: EnergyTag Guidelines for Granular Certificate Use Cases**
Chapter 1 of this document provides the first version of EnergyTag’s Guidelines for the use of Granular Certificates. None of the Use Cases are mandatory, but these Guidelines must be followed where the consumer wishes to prove, through a third party independent audit, their GC use is “Aligned with the EnergyTag Guidelines”.

Chapter 2 of the document gives EnergyTag’s initial considerations on temporal GHG (Greenhouse Gas) calculations that are not yet considered guidelines.

**ii. Purpose and Scope**

**Basic purpose of Granular Certificates**
The central purpose of Granular Certificates (GCs) is to make electricity traceability (i.e. EACs / GCs) more closely represent the physical reality and real-world availability of clean energy sources. This gives consumers the ability to demonstrate the matching of their consumption with the energy generation source of their choice on a (sub)hourly basis, or to purchase electricity at times that maximise Avoided Emissions.

**Scope and Approach**
Given the nascent state of the Granular Certificate market, EnergyTag favours an inclusive approach to Certificate system boundaries as the market evolves. For example, while restrictive boundaries for the Geographical Matching of generation and

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1Examples of Certificate systems are Guarantees of Origin, I-REC Standard adherents, and RECs.
consumption may result in unnecessary barriers to entry, it could also result in increased value for GCs due to the increased link with physical energy flows. Therefore, on topics like this, EnergyTag cannot yet provide firm requirements. Moreover, a more inclusive process allows jurisdictions to create more restrictive boundaries. The more Domains interact, the more detailed the level of harmonisation of rules becomes.

**Global Approach**

EnergyTag is a global initiative with the intention of enabling the widespread adoption of time-based Use Cases using Granular Certificates. While global harmonisation facilitates accounting for companies, ratings agencies and other standardisation initiatives, this raises challenges which must be resolved if the Standard is to accommodate regional variations.

**iii. Enabling Consumer Choice**

EnergyTag’s intention is to build global consensus on the development of this new market and, ultimately, to provide consumers with a standardised means of realising more sophisticated procurement choices. Some consumers may source GCs from Production Devices which temporally and geographically match their Consumption Points (i.e. 24/7 CFE); while others may source GCs in order to maximise Avoided Emissions, even if there is no link to their own consumption. These Use Cases and GHG topics are discussed in more detail in the GC Use Case Guidelines document. EnergyTag seeks to enable all potential GC Use Cases, leaving it to the market to drive adoption. Some Use Case examples are given below:

**Temporal Matching**

For some consumers, the ability to match the time interval of consumption and the time interval of production of the corresponding energy Attributes is a key Use Case enabled by GCs. In the nascent phases of the market, a market participant could match part of its consumption to Granular Certificates and match the remainder on a non-hourly (e.g. annual) basis as they strive to progressively move towards 100% Temporal Matching without affecting the KPIs of their annual matching targets. The key concepts and guidelines around Temporal Matching are outlined further in chapter 1.1 of the GC Use Case Guidelines. In addition, attention is given to energy storage, and how Storage Devices may participate in GC Schemes in order to provide clean electricity at times of scarcity.

**Geographical Matching**

For some consumers, in order to drive the supply of local clean energy, temporal matching also implies a degree of more precise geographical matching (that is, ensuring that the electricity is produced at the same time and in the same geographical area as that in which it is consumed to help demonstrate deliverability).

Given the nascent state of the market, EnergyTag takes a facilitating approach to geographic matching in order to support user preferences, by detailing options and providing guidelines as further detailed in Chapter 1.2 of the GC Use Case Guidelines.

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2Precedents might be: the Supremacy clause in Art.VI, Para 2 of the US Constitution; and the EU subsidiarity principle in Art.5(3) of the Maastricht Treaty and Protocol (No.2).
3Such as the GHG Protocol of the World Resources Institute.
4Note that unlike the time of production, which will need to be added to an EAC, the place of production is identified.
Avoided Emissions
For some consumers, purchasing GCs is useful to help demonstrate the displacement of carbon-emitting generation at specific times and locations to maximise Avoided Emissions, even if this is not linked to consumption. This topic is discussed in more detail in chapter 2.2 of the GC Use Case Guidelines.

Key Remaining Issues
The main issues which require further development are listed below. These will be addressed in the next phase of development of these Standards and Guidelines:

1. Development of EnergyTag’s position on temporal GHG Calculations.
2. Contribution to facilitating availability of (sub) hourly average, residual and marginal emissions data.
4. Finalisation of position on GC Size.
6. Data reporting method to GC Issuer for Production Devices that have multiple energy sources.
8. Management of auxiliary load on an hourly basis.
9. Management of mixed Issuance of conventional EACs and GCs from the same plant.

10. Coordination of lists of information useful for implementation of the Standard:
    A. Bidding zone names,
    B. Geographic coordinates,
    C. Battery storage efficiencies,
    D. Point to sources for emissions factor data.
Chapter 1: EnergyTag Standard for GC Schemes
A Granular Certificate compliant with EnergyTag is a Certificate relating to the characteristics of energy produced during a period of one hour or less, issued in compliance with the requirements and rules of operation of the EnergyTag GC Scheme Standard. This Standard lays out the requirements that must be met in order to create an EnergyTag compliant GC Scheme.

If existing national EAC Schemes do not, by themselves, provide the temporal granularity that some energy consumers desire, these EAC Schemes could be complemented by GCs. The fact that voluntary energy and carbon reporting standards do not provide specific guidance on hourly reporting may leave energy users undecided as to how best to gain recognition for the benefits of reporting hourly. Therefore, reporting standard organisations are encouraged to consider adopting guidelines on hourly reporting that recognise GCs as the instrument that supports hourly tracking. It is acknowledged that some market participants may choose not to adopt hourly procurement, and that those who do - will do so at different rates, depending on a variety of factors.

The supplementing of EAC Schemes with GCs should be carefully managed. In particular, given that both annual and hourly Issuance and Cancellation could happen at the same time in the same market, several issues need to be addressed, most importantly double-counting. The following chapters provide the requirements and guidelines for implementing a GC Scheme that either supplements an existing EAC Scheme, or which creates a complementary scheme where the evolution of an existing scheme has not yet occurred.

1.1. Roles

Context and Definitions

This chapter defines the mandatory and voluntary Roles of the operational participants needed to implement a GC Scheme, and lists the requirements for each. Each Role represents a liable entity in a GC Scheme. For each Role, the Standard requirements refer to both the parent organisation and its affiliates.
Overview of Roles in a GC Scheme

GC Issuer

Responsible for

GC Registry (Operated by GC Registry Operator)

Issue
GC
Producer Account

Transfer
GC
Trader Account

Cancel
GC
Cancelling Party Account

Measurement Body

Production Device → Grid → Consumption Device

Legend

GCs

Meter Data

Physical Energy

For matching use cases, checks cancellation happens against consumption
Requirements
There are various Roles involved in the administration of a GC Scheme.

- These may or may not be vested in the same party. Where they are vested in several parties, attention shall be given to the interaction between the various Roles, with some interactions being mandatory to ensure trust in the Scheme.

Account Holding
- A GC Account Holder shall adhere to the criteria as set out by the GC Issuer.

GC Issuer
The GC Issuer:
- shall exist and be identified in all GC Schemes,
- shall prove compliance with this Standard via a third party audit,
- shall ensure the avoidance of double-counting of the GCs that it administers throughout its lifetime,
- shall be independent of production, trade and supply,
- shall not own or hold a beneficial entitlement to any GC except to prove its own consumption, for testing purposes or as a means of recovery from public support mechanisms,
- shall set criteria for becoming an Account Holder in such a way as to prevent fraudulent usage of the GC Scheme, and,
- may or may not be the same body as the EAC Issuing Body. Where it is a different party, the GC Issuer shall remain liable to the Account Holder for its actions regarding the referenced EACs.

For Energy Storage, the GC Issuer (see chapter 1.6 on storage for details):
- shall ensure that Storage Charging Records (SCRs) and Storage Discharging Records (SDRs) and Storage Discharge GCs (SD-GCs) have been managed in compliance with the requirements in chapter 1.6,
- shall keep records of all information on input GCs / SCRs / SDRs / SD-GC.

GC Registry Operator
A GC registry operator:
- shall exist and be identified in all GC Schemes,
- shall record the characteristics of the Production Devices for which that GC Issuer is responsible, and shall ensure that this is consistent with the data on the underlying EAC Registry where relevant, shall record the Accounts and the Certificates held in them,
- shall record the Accounts and the Certificates held in them, and,
- shall operate to comply with the requirements of the EnergyTag Standard.

A Measurement Body:
- shall exist and be identified in all GC Schemes.

Consumption Verification Body
The CVB:
- shall exist and be identified if consumption/production matching claims take place (e.g. see chapters on Temporal Matching and Geographical Matching in the GC Use Case Guidelines),
- shall check that GCs are Cancelled against energy consumption measured at the relevant Consumption Points if required by the GC Use Case. If Temporal Matching is being performed, then the CVB shall ensure GC Cancellation is in the same time interval as consumption,
- may be a GC Issuer, a Platform or another suitable and competent organisation, and
- shall be independent of the body being audited.
Product Verification Body (PVB)

The PVB:

- may be a Role where product offers based on the GC Scheme and the Use Cases outlined in the GC Use Case Guidelines are being made and used for claims by consumers, and,
- shall be independent of the body being audited.

1.2. GC Scheme Configuration

Context and Definitions

This chapter provides a framework to allow market participants to voluntarily obtain GCs and enable consumer choice, while ensuring smooth interaction with existing EAC Schemes and avoiding Double Counting. The framework is based on the following key considerations:

- System Configuration: EnergyTag proposes two different configurations for the relationship between GC and EAC Schemes:
  - Configuration #1 - GC Scheme evolves out of EAC Scheme: the GC Scheme is the evolution of an existing EAC Scheme, such that the currently appointed EAC Issuing Body evolves into a GC Issuer, and,
  - Configuration #2 - GC Scheme supplements EAC Scheme: the GC Scheme is an extension of an existing EAC Scheme and is managed by verified and approved third-parties. Tasks and responsibilities related to the GC Scheme are performed by third-party entities in compliance with the rules and oversight of the existing EAC Scheme and EAC Issuing Body.

- Double Counting Risk Mitigation: all the double-counting risks that could theoretically take place in any energy Certificate scheme are to be considered. These include:
  - Double issuing - meaning that there is more than one Certificate Issued for the same purpose or claim per unit MWh of eligible energy production,
  - Duplication during transfer - either as a result of a technical error in the electronic processes, or due to fraud, a Certificate could end up in both the receiving and sending Account of the Transfer,
  - Double registration - in relation to IT system security and IT operational risks, the same Certificate could erroneously get registered more than once,
  - Double cancellation - meaning that the same Certificate is Cancelled more than once,
  - Double usage - meaning that a Cancelled Certificate is used for more than one claim (i.e. claimed energy amount is greater than produced energy), and
  - Double disclosure (double claiming) - whereby the Attributes of the amount of energy for which a Certificate is Issued are also claimed by other means than the Cancellation of that Certificate.

The GC Scheme configuration impacts its entire lifecycle, the Roles of participants and how they must interact with (or within) underlying EAC Schemes in order to prevent double-counting. The remainder of this chapter first seeks to give an overview of the key components of current EAC Schemes (Configuration #0), before going on to define the two alternative proposals for GC Scheme implementation (i.e. Configuration #1 and Configuration #2) and give the requirements for each.

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A product could be, for example, a supplier offer which promised 80% 24/7 Carbon Free Energy over a year. Verification of the product would require information like GC Cancellation statements and production data.

It may be perfectly valid to issue separate Certificates (i.e. for support and disclosure) based on the same MWh.

Prevention of double usage and disclosure may be ensured by nominated competent bodies or third party verification programs.
In order to understand the changes proposed in the configurations for GC Schemes, it is first important to understand how today’s EAC Schemes work.

1. **Production Measurement:** The Production Device converts physical energy from one Energy Carrier to another.

2. **EAC Issuance:** Based on this measurement data, the EAC Issuing Body issues EACs on the Account Holder’s Account. The Account Holder may be the Producer or its assigned agent. The EAC Issuing Body is the only Issuer in the Domain for the relevant type of EAC.

3. **EAC Transfer:** The original Account Holder may Transfer the EACs to the Account of another Account Holder in the registry governed by the EAC Issuing Body. EACs may be Transferred multiple times during their lifetime, until they Expired or have been Cancelled, after which Transfer is no longer possible.

4. **EAC Cancellation:** At some point in time, the EAC resides in the Account of an Account Holder who decides to Cancel the EAC. An Account Holder may Cancel EACs on its own behalf or on behalf of another beneficiary.

5. **Claim:** The Beneficiary (i.e., final consumer) may make a claim (e.g., 1 MWh of wind consumed) based on Cancelled EACs (usually cancelled by Producer/supplier on behalf of the Beneficiary).

Based on the fundamentals in Configuration #0 above, the rest of chapter 1.2 describes two Granular Certificate system configurations. When considering these configurations, it is useful to keep in mind that a GC is conceptually an EAC with temporal granularity, and that an EAC and a GC are equivalent in most other respects.
GC Scheme Configurations

Configuration #1. GC Scheme evolves out of EAC Scheme

In this configuration, the GC Scheme constitutes an evolution of an existing EAC Scheme. The GC Issuer is the EAC Issuing Body. GCs are Issued instead of standard EACs following five key steps:

1. **Production Measurement**: The Production Device generates physical energy. The Measurement Body measures each unit of eligible energy and reports it to the Issuing Body.

2. **GC Issuance**: Based on this measurement data, the Issuing Body issues GCs to the Account of an Account Holder. The Account Holder may be the Producer or its assigned agent. The Issuing Body is the only Issuer in the Domain for the relevant type of GC.

3. **GC Transfer**: The original Account Holder may Transfer the GCs to an Account of another Account Holder in the Registry governed by the Issuing Body. GCs may be Transferred multiple times during their lifetime, as long as they have not Expired or been Cancelled.

4. **GC Cancellation**: At some point in time, the GC resides in the Account of an Account Holder, who decides to Cancel the GC. An Account Holder may Cancel GCs on its own behalf or on behalf of another Beneficiary.

5. **Claim**: The Beneficiary (i.e. final consumer) may make a claim of the Attributes of the energy it has consumed based on Cancelled GCs (usually Cancelled by an Account Holder on its behalf).

(Note that the above scheme is currently not possible in the EU where the legal definition of the GO is a fixed 1 MWh volume.)

In the EU, the EAC Issuing Body is a body appointed and regulated by national/regional governments.

Chapter 1: EnergyTag Standard for GC Schemes
Requirements

- The same double-counting mitigation measures as in the related EAC Scheme shall be followed where they are applicable for GCs.
- Issuing rules:
  - The GC Issuer shall issue GCs for eligible energy produced.
  - The GC Issuer shall ensure its information systems manage the GC lifecycle from Issuance to Cancellation.
  - The Production Device owner may choose to opt-in and request the Issuance of GCs.
- The Issuer may either:
  - i) Issue an EAC and subsequently convert it into GCs.
    - In this case, the EACs are Cancelled without being allocated to energy consumption: they are no longer tradeable and are not used for disclosure of the origin of energy towards consumers;
    - or
  - ii) Issue GCs directly.
- The increased complexity of issuing GCs suggests that EAC processes or Certificate Issuer processes may need to be upgraded.
- The Account Holder may be the Producer or its assigned agent.
- GCs may be Transferred multiple times during their lifetime, as long as they have not Expired or been Cancelled.
- An Account Holder may Cancel GCs on its own behalf or on behalf of another Beneficiary.

Configuration #2: GC Scheme supplements EAC Scheme

In this configuration, the GC is Issued on a GC Platform, which is an information system that (among other things) may provide GC Registry services. The avoidance of double-counting is ensured by maintaining a centralised and underlying EAC Registry, which is referenced during GC Issuance. The GC is a separate instrument that must be linked to the underlying EAC. The GC Platform may be operated by a third party or by the EAC Issuing Body itself. The GC Platform Operator operates the GC Registry and is the GC Issuer in this configuration.
In this configuration, the GC Scheme supplements an underlying EAC Scheme. GCs are Issued following five key steps:

1. **Production Measurement**: The Production Device generates physical energy. The Measurement Body measures each unit of eligible energy and reports it to the EAC Issuing Body and GC Issuer.

2. **Issuance**:
   - **EAC**: Based on this measurement data, the EAC Issuing Body Issues EACs to the Account of an Account Holder. The Account Holder may be the Producer or its assigned agent. The EAC Issuer is responsible for registering EAC ownership and guaranteeing the uniqueness of the EAC. The GC Issuer should be an Account Holder on the EAC Registry if possible.
   - **GC**: The GC Issuer Issues GCs based on measurement data that relate to the same Production Device for which the EAC Issuing Body has issued the corresponding EACs. EACs may reside in the Account of the GC Issuer in the EAC Registry. The GC Issuer allocates the temporal Attributes of these EACs, in the form of GCs, to market parties.

3. **GC Transfer**: The original Account Holder may Transfer the GCs to an Account of another Account Holder in the GC Registry. GCs may be Transferred multiple times during their lifetime, as long as they have not Expired or been Cancelled.

4. **Cancellation**: Simultaneously:
   - **EAC**: Following the request of market parties in the GC Registry, who Cancel/validate the temporal value of the GCs against corresponding energy consumption, the GC Issuer Cancels EACs. The GC Issuer may be the Beneficiary of each Cancellation. Strict criteria

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Practical real-life examples can be found in the EnergyTag demo projects.
must be met to ensure that there is never the opportunity for double usage of the same Attribute: this is ultimately the responsibility of the EAC holder, which is ideally the GC Issuer.

- **GC:** The appropriate Account Holder on the GC Registry Cancels the GCs\(^9\) and, based on this, the Beneficiary may make a claim.

5. **Claim:** The Beneficiary may make a claim (e.g. hourly Temporal Matching) of the Attributes of the energy it has consumed based on Cancelled GCs (usually Cancelled by an Account Holder on its behalf). The ultimate Beneficiary of the claim is disclosed in this step through relevant contractual arrangements.

**Requirements**

- The GC Issuer responsible for GC management in this configuration **may** be the EAC Issuing Body or a third party. The GC Issuer, or its agent, operates the GC Registry.
- A GC Registry **shall** offer a granular view of the EACs from an Account in the EAC Registry and add, where relevant, the necessary temporal information to allow them to be classified as GCs.
- The GC Issuer **shall** be appointed or otherwise accepted by the EAC Issuing Body of the underlying EAC Scheme.
  - This **shall** involve adherence to such public rules and contractual arrangements as are required by the EAC Issuing Body to ensure effective coordination and prevent Double Counting.
  - Such protocols and agreements **shall** include the EAC Issuing Body and the GC Issuer. They **may** also include other parties such as the Producer, market parties and the ultimate Beneficiary of the Attributes upon Cancellation of the GC and underlying EAC.
- The GC Issuer **shall** avoid double-counting by ensuring effective coordination with the underlying EAC Scheme.
  - Double counting of the same Attributes **shall** be avoided at all times.
  - The GC Issuer **should** hold an Account on the EAC Registry.
  - If the GC Issuer holds an Account on the EAC Registry:
    i. it **shall** ensure proper Cancellation of underlying EACs to support any claims relating to energy produced by the same Production Device in the same generation period, and
    ii. it **shall not** own any EAC or hold any beneficial entitlement to it except on behalf of the holder of the associated GCs.
  - Where implemented, software solutions connecting the EAC Registry and GC Registry **shall** ensure that any change to the ownership or lifecycle of the EAC or GC is automatically and instantaneously fulfilled on both Registries.
- The GC Issuer **shall** be liable to the Account Holder for its actions regarding the referenced EACs. The GC Issuer **shall** take responsibility for and, where relevant, allocate liability to the relevant actors within the GC Registry.
- Claims based on the Cancelled EACs or GCs **shall** not double-disclose the Attributes of the same quantity of energy. The overarching disclosure mechanism **should** Account for this:
  - To facilitate this, the GC Issuer **shall** ensure that the Attributes of the underlying EACs are allocated to the Beneficiary(ies) of the corresponding GCs.
  - Where the GC Issuer is the Beneficiary of the Cancelled EAC it **may** then allocate the associated GCs to multiple beneficiaries.

\(^9\)Note that given EAC is in 1 MWh units, it is likely that multiple GCs would be Cancelled concurrently per EAC to ensure equivalent Cancellation volumes.
Where such a body is in place, the competent body shall be responsible for supervision of disclosure of the origin of energy towards consumers and has oversight of the EACs Cancelled with and without granular information for GC Issuance. The competent body shall ensure that Cancelled EACs that are linked to GC Registries do not duplicate Attributes in overall statistics and claims regarding Attributes that are also covered with GC Cancellations. This may require an adequate mechanism for deducting EACs backed by GCs on a GC Registry from its figures for Cancelled conventional EACs.

- Clear rules shall be established between the EAC Issuing Body and the GC Issuer regarding the claims that can be made based on the Cancelled EACs and the lifespan, tradability and end-of-life of GCs.
- The Account Holder may be the Producer or its assigned agent.
- GCs may be Transferred multiple times during their lifetime, as long as they have not Expired or been Cancelled.
- An Account Holder may Cancel GCs on its own behalf or on behalf of another Beneficiary.

### Evaluation and recommendation

Both configurations are capable of meeting the requirements for credible GC Schemes, with some advantages and drawbacks outlined below to facilitate a consideration of which configuration to adopt.

<table>
<thead>
<tr>
<th>Configuration #1</th>
<th>Advantages</th>
<th>Drawbacks</th>
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| GC Scheme evolves out of EAC Scheme | • Easier double counting mitigation  
• No new roles or participants  
• “Easier to trust” perception | • Adoption process may be slow in a well-established EAC Scheme  
• Complex overhaul of existing IT system |

<table>
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<tr>
<th>Configuration #2</th>
<th>Advantages</th>
<th>Drawbacks</th>
</tr>
</thead>
</table>
| GC Scheme supplements EAC Scheme | • Potential for faster adoption  
• Enables GC innovation where EAC issuing body mandate is restricted  
• Stimulates competition among Platform providers | • More complex double-counting mitigation  
• New role [e.g. Platform] requires adoption of new double counting mitigation processes |

### Requirement on Configuration Preference

- GC Scheme configuration should follow Configuration 1 where possible to facilitate harmonisation and more easily avoid Double Counting. However, GC Scheme configuration may follow Configuration 2 in order to expedite innovation and Use Cases during the transition to granular systems.
1.3. GC Attributes

Context and Definitions

Existing EACs record various Attributes (e.g. energy source, Production Device, energy input etc.) with Attribute definitions depending on the EAC Scheme / Issuer. A detailed overview of the Attributes on current EAC/GC Schemes (e.g. EECS, M-RETS, I-REC) is provided in this spreadsheet ([Certificate System Attributes]). It is important that GCs reflect the existing Attributes in their corresponding EAC Scheme, while adding Attributes to ensure in higher temporal resolution.

Requirements

- **GCs shall** be immutable from Issuance to Cancellation - that is, once a GC has been Issued, then the data recorded on it is never removed or modified. This data remains intact until the point of Cancellation.
- **GCs shall not be duplicated or double-counted,** and
- **GCs shall replicate the Attributes found on any underlying EACs in the same Domain.**

In all cases GCs shall:

- state the Energy carrier (e.g. electricity, fuel [gas, liquid, solid], heating and cooling),
- have a unique identification number, received at Issuance and maintained over the full Certificate lifetime (being until Cancellation in relation with energy consumption, storage or conversion or until the Certificate Expires),
- state the date when the Production Device became operational,
- state the production / storage discharge interval:
  - starting Timestamp (UTC “HH:MM:SS, DD/MM/YYYY” e.g. “00:00:00 01/01/2021”),
  - ending Timestamp (UTC “HH:MM:SS, DD/MM/YYYY” e.g. “00:14:59 01/01/2021”),
- state the GC Issuance date-stamp (UTC “HH:MM:SS, DD/MM/YYYY”),
- state the source of produced energy,
- state the technology used to produce energy,
- state the name of the Production Device,
- state the unique ID of the Production Device (if available),
- state the capacity of the Production Device,
- state the country/region of Issuance,
- indicate the geographical location of the Production/Storage device that released the energy for which the GC is Issued (including zip code / postcode, street, city and country, and/or GPS coordinate). Where available, GPS coordinates shall be stated,
- use Wh as the base unit rather than a multiple (kWh, MWh etc.) unit,
- state the face value of Certificate (being the volume of energy represented by the Certificate),
- be rounded down to the nearest Wh whole number,
- state the identity of the GC Issuer,
- state whether it is Issued from production or release from storage,
- reference the Bidding Zone and/or Balancing Authority of the Production Device (if available),
- contain a reference to an identification of the grid (or other transport means) into which the energy is injected (if grid connected and available),
- state whether or not it can be used to inform consumers of the origin of the energy they consume (i.e. disclosure).

As needed, GCs may record the following information:
Chapter 1: EnergyTag Standard for GC Schemes

- legal status of Certificate (including responsible authority, where relevant),
- whether support has been received and, if so, whether for investment, production or both,
- a reference to quality schemes under which this Certificate is eligible,
- dissemination level of the physical energy,
- whether it has been Issued following Energy Carrier conversion,
- a reference to related GCs / SCRs / SDRs corresponding to energy that was charged and discharged from a Storage Device,
- a production emissions factor (kgCO2eq/MWh) where available and a reference to the methodology for its calculation,
- average, residual and marginal grid emission factors (kgCO2eq/MWh), specific to the time and location of production or storage discharge where available and if included shall reference the source and methodology used for determining these emission factors, and
- such additional Attributes as are relevant to the functioning of the GC Scheme and/or the underlying EAC Scheme.

Note #1: Standardising GC Size

A GC corresponds to a certain quantity of energy. However, EnergyTag has not yet standardised the GC size in order to benefit from practical experience and audits prior to deciding if and how to standardise this critical aspect. There will be a specific sub-group set up to tackle this topic. When considering standardisation, the following principles will be taken into Account:

1. **Immutability**: once Issued, a Certificate does not change.
2. **Splitability**: at the Transfer of GCs between Accounts, or at Cancellation, it may be that only some of the energy produced in an hour by the Production Device is used by a given consumer. Therefore, it must be possible to split batches of GCs.
3. **Data Volumes**: it is critical to ensure the above principles are met in the most data- and energy-efficient manner. Therefore, it may be preferable for GCs to be stored in batches identifying the start and end Certificate numbers in the batch.

In summary, while variable volume GCs are efficient in terms of data volumes stored, they may present issues with immutability and splitability, due to the difficulty in maintaining a unique ID for every basic unit of energy, from one Domain to another. Having fixed-size Certificates managed in batches could overcome this issue, while limiting data volume and energy consumption. EnergyTag will refine this aspect of the Standard in future versions of this Standard.
1.4. Time zones

Context and Definitions

Harmonising the Time Zone on GCs across systems and Domains helps avoid a number of complexities related to the Transfer of GCs across time zones and handling of unsynchronised daylight savings time arrangements.

Requirements

∙ GCs shall use UTC (Coordinated Universal Time) for expressing time (e.g. production interval start and end Timestamps).

1.5. Producer Metering and Registration Data

Context and Definitions

In general, the Producer and production metering data requirements for GCs will be the same as existing EAC mechanisms. The major additional specific requirement will be that data are provided with at least hourly time resolution.

Requirements

Producer Data

∙ If a Production Device is already registered in an EAC Registry, or if simultaneously registering for EACs and GCs (see system Configuration #2 chapter 1.2), all Production Device registration data from the EAC Registry Account shall be provided to the GC Issuer, with the consent of the Producer, to ensure consistency.

∙ For applications for GCs that are not derived from an existing EAC Registry, or where EAC Registry data omits the data below, applicants seeking to register a Production Device shall provide the following information to the GC Issuer and keep it up to date:

- the applicant’s contact details,
- Production Device ID unique to the Domain\(^{11}\),
- the name of the Production Device,
- the Registry Account into which the GCs for the units of produced energy will be Issued, or a request to open such an Account,
- geographical location of Production/Storage Device (including zip code / postcode, street, city and country, and/or GPS coordinates). Where available, GPS coordinates shall be stated.
- a reference to an identification of the grid [or other transport means] into which the energy is injected (if grid connected and available),
- details of any production auxiliaries associated with the Production Device,
- all energy sources which may be converted into an output Energy Carrier of the Production Device,
- the technology type used by the Production Device,
- the capacity of the Production Device,
- the date when the Production Device became operational,
- the identity of the Measurement Body responsible for collecting and determining the energy produced by the Production Device and providing this to the GC and/or EAC Issuer,
- details of any payments of public support which have been made or are due in association with this Production Device,
- a diagram of the Production Device, including details of the location of the entry and exit measurement point(s) for the Production Device and of any Production Auxiliaries connected to the Production Device,

\(^{11}\)A unique Production Device IDs could be generated by using GS1 codes as is currently the case in Europe under EECS.
- the identity of any label scheme under which this Production Device is accredited,
- Meter ID, including an indication of whether this is gross or net measurement of generation,
- Meter type (utility, submeter),
- Meter serial number,
- the associated utility consumption meter ID and any other behind-the-meter production or storage IDs, for production systems that are behind a utility consumption meter. Data for each associated consumption, production, or storage ID should be reported according to the data requirements in Note #1 of GC Use Case Guidelines.

For applications for GCs that are not derived from an existing EAC Registry, or where EAC Registry data omits the data below, applicants seeking to register a Production Device shall grant access to the GC and/or EAC Issuer to the Production Device together with records relating to it which will enable the information provided in connection with that application to be verified.

Production Data
Registered energy Producers or qualified reporting entities shall submit the following data to the GC Issuer per measurement reporting period:

- Production Device ID unique to the Domain,
- Meter ID,
- Interval Start Timestamp (UTC “HH:MM:SS, DD/MM/YYYY” interval starting, e.g. “00:00:00 01/01/2021”),
- Interval End Timestamp (UTC “HH:MM:SS, DD/MM/YYYY” interval ending, e.g. “00:14:59 01/01/2021”),
- Production quantity (Wh),
- Gross/net production indicator.

Storage Data
For any Storage Device from which GCs / Storage Records will be issued/kept, that device will be considered both a Production Device and a Consumption Point and should be registered in the same manner as Production Devices specified above. Registered Storage Devices or qualified reporting entities shall submit the following data to the GC Issuer per measurement reporting period:

- For registered Storage Devices, the following data shall be metered and shared with the relevant verification/Issuing Body:
  - Meter ID number,
  - Interval Start Timestamp (UTC “HH:MM:SS, DD/MM/YYYY” interval starting, e.g. “00:00:00 01/01/2021”),
  - Interval End Timestamp (UTC “HH:MM:SS, DD/MM/YYYY” interval ending, e.g. “00:14:59 01/01/2021”),
  - Indication of state during each interval (charge/discharge),
  - Interval charge/discharge (Wh).

- For behind-the-meter storage systems, data from the storage meter shall be accompanied by the utility consumption meter ID data as specified in the GC Use Case Guidelines.

Other considerations around storage and storage metering can be found in chapter 1.6 of this document and chapter 1.5 of the GC Use Case Guidelines.

*In instances where metering data are not available in Wh, kWh metering data may be submitted.*
Data Transfer

- Production data shall be submitted to the relevant body (e.g. GC Issuer, Consumption Verification Body) at a frequency agreed between the parties.
- In some regions, there are established data hubs where many different energy providers report usage data\(^13\). In these cases, the Producer, customer or authorised third party may enable direct access to the data to the Consumption Verification Body or GC Issuer. While not a requirement, EnergyTag supports these efforts to enable data transparency and access.

1.6. Energy Storage

Context and Definitions

Energy storage deserves particular attention when managing GCs. For existing EACs systems, Cancellation for storage is not required as storage is not end-consumption and, in most cases, storage losses are dealt with by Cancelling the corresponding number of EACs\(^14\). GCs related to energy fed into and released from storage cannot be managed like this, as the time interval in which the energy is charged and discharged is of essential value for Use Cases involving Temporal Matching, Avoided Emissions and/or compliance. EnergyTag acknowledges that these Use Cases for storage are complex and are still in an early stage of development and implementation. Therefore, the goal of this section is to lay simple foundations that describe the most basic behaviour of Storage Devices, which can evolve and eventually be further standardised as Use Cases mature. To do this, a simple, descriptive and use-case agnostic instrument is required.

Introducing the Charging Records Instrument

The Standard proposes that all charged energy in a given time-interval is recorded in the Registry using Storage Charging Records (SCR), and that all discharged energy in a given time-interval is recorded using Storage Discharging Records (SDR). These records are not equivalent to tradeable Granular Certificates and do not contain information regarding the energy source of the energy charged into the storage device (unless corresponding GCs are allocated to these records). Charging records are use-case agnostic.

Storage Overview Schematic

The schematic below presents the key mandatory concepts in any storage-related Scheme. For the purpose of clarity, the two primary storage related Use Cases, i) Temporal Matching and ii) Avoided Emission are shown on the schematic, along with the mandatory elements i.e. the SCR and SDR. Neither of these use cases is mandatory. Detailed rules are given in chapter 1.5 of the GC Use Case Guidelines as to how both these Use Cases are to be implemented.

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\(^{13}\)Such as Estfeed in Estonia or Energinet’s DataHub in Denmark.

\(^{14}\)Note that in some cases EACs are not Cancelled for losses.
Storage Schematic for GC Schemes

GC

Cancelled

SCR

Grid

SDR

1-1 or many-many

OR

Each SDR allocated in only one use case

SD-GC

No primary energy source disclosed

Issuance conditional to Cancelled GC + SCR&SDR allocation

Key Definitions

**SCR**
Storage Charge Record (Mandatory)
Registry record of energy charged to storage in a time interval

**SDR**
Storage Discharge Record (Mandatory)
Registry record of energy discharged from storage in a time interval

**SD-GC**
Storage Discharge GC (Optional)
GC issued after storage discharge. See GC Use Case Guidelines 1.5 for details

**Matching Use Case (Optional)**
See GC Use Case Guidelines 1.5 for detailed rules

**Avoided Emissions Use Case (Optional)**
See GC Use Case Guidelines 1.5 for detailed rules
Requirements

- Storage Charging data for each time interval shall be recorded in the Registry upon input to Storage Device, as a Storage Charging Record (SCR). The SCR:
  - Shall record the time interval of charging,
  - Shall record energy charged (Wh),
    - May record the energy source and other Attributes of the allocated (Cancelled) GC if required by the Use Case (see chapter 1.5 of GC Use Case Guidelines),
  - May record emissions caused with reference to method.

- Storage discharge data for each time interval shall be recorded in the Registry upon output from the Storage Device, as a Storage Discharge Record (SDR). The SDR:
  - shall record time interval of discharging,
  - shall record Discharged energy (Wh),
  - shall be allocated to a Beneficiary,
  - the Beneficiary may be:
    i. a SD-GC, on condition that SD-GC Issuance shall follow the rules laid out in chapter 1.5 of the GC Use Case Guidelines for Temporal Matching, including that Issuance is only after Cancellation of a GC allocated to an SCR, or
    ii. an end-user, following the rules as laid out in chapter 1.5 of the GC Use Case Guidelines for Avoided Emissions;
  - may record Avoided Emissions and, if so, reference shall be made to its method of calculation.

- SCRs shall be allocated to SDRs, provided storage losses have been accounted for as described further in chapter 1.5 of the GC Use Case Guidelines.

- Allocation may be done in batch or on a 1-to-1 basis, for all records and/or GCs with identical information.

Call for cooperation: For the purpose of clarity, this section of the Standard only defines basic concepts regarding system behaviour, without taking a position or precluding any specific Use Cases which need further refinement. EnergyTag will set up a specific Storage working group over the coming months to resolve and develop a standardised position where possible on each Use Case. If you are interested in contributing, please contact us.

1.7. Scheme Time Constraints

Context and Definitions

The GC Validity Period is the period of time, ex-post, in which participants may buy and make claims using GCs. Ensuring that GCs cannot be used to make claims for an indefinite period after their production is an intrinsic part of the trust in the instrument. Moreover, harmonising GC Validity Periods for interconnected EAC Schemes has proven to enhance market liquidity. Having different Validity Periods in different Domains may cause complexity, for example in handling blocked EAC/GC exports due to their having passed the expiry date in the importing country.

In cases where GCs are used for Temporal Matching of consumption with production, the need for harmonised GC Validity Periods may be rendered irrelevant, with the local ex-post limitation for the completion of Temporal Matching transactions being the critical criteria in these cases. Nevertheless, setting an absolute maximum validity is deemed prudent to allow for cases where the GC has not been temporally matched, and to avoid trades that may undermine system credibility.
Standardising GC retention on registries after Cancellation is essential for dispute and error resolution, taxation and investigation of market behaviour etc. and hence EnergyTag also standardises this aspect.

Requirements

- GCs shall have a maximum Validity Period of 12 months, unless local market rules extend this. Such an extension shall have a maximum of 24 months. In markets where the EAC Validity Period extends beyond 24 months, it is recommended that the maximum GC Validity Period remains 24 months to ensure that the key benefits of moving to GCs are delivered.
- All records relating to Issued, Transferred, Cancelled and Expired GCs shall be retained on the GC Registry for a minimum of 5 years after their Cancellation, or longer if required in national legislation.

1.8. IT Systems Architecture and Data Standardisation

Context and Definitions

EnergyTag recognises the crucial role of data standardisation and encourages it where possible to facilitate GC Scheme interoperability. EnergyTag will develop an API (Application Programming Interface) standard and other relevant data standards to facilitate Registry interoperability and is willing, where required, to facilitate and contribute to other data standardisation efforts that help GC market growth. The EnergyTag Standard and Guidelines are agnostic to the IT system architecture that is used to implement GC Schemes.

Requirements

GC IT Systems:
- shall meet the EnergyTag API data standard, once available, providing for system interoperability via API, unless they are stand-alone systems, and
- shall meet prevailing security and privacy standards across served territories and follow EnergyTag data standards once available.

1.9. Fraud Detection and Prevention

Context and Definitions

Fraud is a major risk in designing and managing EAC and GC Schemes, due to the serious consequences of fraud on system integrity and trust. Therefore, in order to build knowledge and awareness, this chapter provides context and definitions of the key aspects of fraud prevention. The key questions that should be addressed when considering fraud prevention are: what risks are induced by GCs being exchanged between countries in different systems? and, in cases where GCs and EAC are Issued on separate systems, what are the additional fraud risks?

It should be noted that international and national legislation will override any EnergyTag standard in the context of fraud protection and prevention.

Fraud could happen at various parts of the process and in multiple forms:
- Metering data fraud at the production site: This risk involves the possibility of metering data manipulation, which could be used to obtain undeserved GCs in either the measurement or the reporting process.
- Metering data fraud at the consumption site: This could take place during either the measurement or the reporting process and involves the possibility of metering data manipulation, which could be used to improperly Cancel GCs - for instance, claiming that consumption took place at a time of day when energy is either cheaper or less carbon intensive.
- Improper amendment of registry data: Improper GC data amendment could take place by means of illicit access including hacking. Therefore, Registry data integrity is vital to ensure well-functioning GCs Registries.
VAT Carousel fraud (Missing Trader Intra Community (MTIC) fraud): MTIC fraud is most common in the EU, but is also seen in other jurisdictions that have a value-added tax, such as Singapore.

Like other commodities, GC Schemes could be threatened by MTIC fraud, especially during their early development phase. In MTIC schemes, fraudsters exploit taxation rules from different jurisdictions to steal Value Added Tax (VAT) payments. Wholesale commodities trading allows fraudsters to execute significant volumes of international deals in short periods of time, and collect the associated VAT payments. These companies disappear without remitting the collected taxes to the relevant revenue administrations. In some cases, the same commodity could be traded in a cyclical fashion, such that it is exported and imported several times from/into the same country, collecting VAT in each cycle (carousel fraud). This multiplies the potential effect of the fraud. For example, MTIC fraud in EU carbon markets in 2008-2010 translated into massive VAT losses (several billion euros) for EU Member States. Gas and power markets, and more recently EACs systems, have been threatened by this risk in recent years.

Money laundering: GCs could be used as an instrument for disguising funds from illicit activities as legitimate funds (money laundering). This risk could be increased by trading in GCs, due to the lack of transparency and the current predominance of over-the-counter deals in EAC markets. Price and billing arrangements between counterparties to the trade may be used as part of integration or layering operations.

Market manipulation: One of the objectives of GCs is to create a trusted, tradable commodity, and the associated adequate price signals that encourage an efficient integration of clean energy. These price signals could be affected by market manipulation and insider trading. Market manipulation involves practices such as creating misleading signals on the supply or demand of the commodity and the dissemination of misleading information (e.g. through the media) that could impact the market. Insider trading is another example of market manipulation, which involves the use of insider information (i.e. information that is not public and that could significantly impact the market if it were) to execute trades before that information becomes public.

Requirements

Metering data fraud at production site
- The current controls in place in EAC Schemes shall be adapted to help prevent this type of fraud.
  - These controls include the use of certified entities in charge of measurement and validation of production data (e.g. Transmission/Distribution System Operators), and secured channels to ensure the integrity of the data when transmitted to the GC Issuer. Although GCs require more precise data related to production (i.e. hourly profiles), the fact that measurements are done by system operators considerably reduces the risk of fraud.
  - On-site audits of Production Devices shall be carried out by GC Issuers (or other delegated entities) to ensure the veracity of the technical specifications declared by the Producer and the adequate connection to metering devices.

Metering data fraud at the consumption site
- Similar controls to those relating to metering data fraud at the production site are appropriate, and are likely to be in place for EACs. These should also be in place for GCs.
Improper amendment of registry data

- Improper access and manipulation of GC Registry data should be avoided by adopting strict data security rules,
  - including: regular (ideally annual) systems penetration testing and the resulting enhancement of systems, restricting physical access to data, careful definition and assignment of Roles and procedures, regular updating of systems software, recording and auditing all changes to computer systems, effective controls over access rights and passwords etc.

VAT fraud (Missing Trader Intra Community (MTIC) fraud)

Protecting GCs from MTIC risks should be done at different levels:

- GC Issuers should implement adequate due diligence procedures when admitting Account Holders into their system.
  - This includes Know-Your-Customer (KYC) processes, including provisions to refuse suspicious companies or suspend suspicious Accounts.
  - KYC procedures should be designed in a way that GC Issuers have an appropriate knowledge about the business, the managers and stakeholders of the company that will enter the GC market. AML (Anti-Money Laundering) /CFT (Combatting the Financing of Terrorism) standards recommend applying a well-defined risk based approach (e.g. scoring methods) as part of onboarding decisions and monitoring of the companies’ activity.
- GCs Issuers should implement effective monitoring of Registry activities aimed at detecting suspicious activities and MTIC patterns in particular (e.g. sudden increases of trading volumes, carousel schemes etc.).
- GC Issuers should establish efficient cooperation with authorities in charge of preventing MTIC fraud, especially tax authorities and Legal Enforcement Agencies (LEAs).
- Any change of ownership of the Certificate shall be recorded in the relevant Registry. GC ownership should be primarily restricted to the Account Holder where the Certificate is held. Where a change of ownership does not lead to Transfer from one Account to another (e.g. third party trading), the ultimate owner shall be properly identified by the Account Holder at any time (name, country, VAT registration number). Transactions where none of the parties have an Account in the relevant Registry or have not been properly identified should not be authorised.
- (European Union only) GCs should be considered “electricity Certificates”, enabling Member States to apply for the derogation introduced by the EU in 2013 that allows the application of reversal liability to VAT on specific goods or services considered “at risk”\textsuperscript{16}
  - Using this derogation, the responsibility of paying VAT is no longer with the supplier of the goods or services (the collector), but with the person acquiring the goods or services (the final consumer). This means that the missing trader cannot act as collector anymore. The implementation of this derogation by Member States should be encouraged.

Money laundering

- Due diligence should be carried out by GC Issuers and should help prevent companies with suspicious profiles from joining the market.
- Cooperation with authorities in charge of money laundering prevention should be ensured when suspicious companies/operations are identified. This requires procedures to declare suspicious entities/activities to competent authorities in charge of AML / CFT.

\textsuperscript{16}EU Council Directive 2012/43/EU
Market manipulation

Reducing the risks of market manipulation and insider trading requires several developments that should be seen as long-term goals for the design of GC markets:

- Transparency should be increased by creating robust price benchmarks, standardised products and freely accessible supply/demand information,
- Regulatory frameworks that prohibit/sanction market manipulation and insider trading and which establish accepted market practises should be implemented,
- Regulatory bodies in charge of collecting the necessary information, monitoring and investigating potential cases of market abuse should be established, and
- The above can and should be achieved by including energy Certificates (i.e. GCs/EACs) as part of existing regulatory frameworks (energy or financial regulations).

1.10. Market design

Context and Definitions

GC trades can be executed through the same channels and contracts that exist for standard EACs. The market for GCs will likely be influenced by the current or new rules of voluntary reporting standards, such as those overseen by initiatives like the CDP, World Resources Institute and RE100, that may incorporate increased temporal granularity.

Increasing the time granularity increases the complexity of procuring such Certificates. For example, achieving 100% hourly matching would require a number of trades which are multiple orders of magnitude higher than for yearly/monthly Certificates, and is likely to require a way to trade Certificates17 in each individual hour, as well as standardised products. As physical energy is also traded on an hourly or sub-hourly basis, the market design for hourly Certificates may eventually become closely aligned with that of physical energy markets.

Ultimately, trading GCs will most likely engender the need for flexibility solutions, such as storage, Demand-Side Response (DSR) or Local Energy Markets (LEMs). These solutions could provide a stabilising effect on grids where they are used, while also facilitating consumer choice and/or retailer preferences.

Requirements

- As with the majority of contracts for buying clean energy through standard EACs, the purchase of GCs is voluntary. As such, the GC market shall comply with wider contract law in its chosen jurisdiction and with the regulations of the overarching EAC Scheme.
- GC Schemes in interconnected markets should be harmonised as much as possible in order to lower market barriers and market confusion caused by differences between separate GC Schemes.

1.11. Linkage with Support Systems

Context and Definitions

Similar to existing EACs, public financial support systems may also be associated with GC Schemes. For example, if support mechanisms were to focus on Temporal Matching, this would raise the question of how the support system would technically relate to the Cancellation of the GC. GCs that qualify for a public support system would likely have a higher market value than other GCs. In either situation, it is important to prevent multiple claims of consumption based on the same underlying unit of energy.

Requirements

- If GCs can be used to receive public support, the document or mechanism which is uniquely used for disclosure of the origin of the consumed energy shall be identified.

17GC trading may be unbundled / separate from physical energy. Trading mechanisms are not the core objective of this Standard and may vary per market, provided the relevant GC Scheme complies with this Standard.
If the support (Certificate) systems are associated with an individual Consumption Point, care should be taken to avoid Double Counting if a separate Certificate system allows for the disclosure of the energy source to consumers (i.e. cross-purpose double-counting avoidance).

1.12. Eligibility of Energy
This chapter discusses which energy is eligible for the generation of GCs, a complex topic with a long history of varied viewpoints. Some participants in existing EAC markets have expressed strong concerns as to whether Certificates may be issued for energy that is not available for trade or electricity that is injected into public grids. Setting restrictions regarding Certificate usage should be done by individual consumers, lawmakers, or by labelling schemes with the GC Scheme providing the necessary and transparent information to facilitate this. In order to do this, EnergyTag considers the key categories under which eligibility may be considered.

i) Distribution reach

Context and Definitions
An interesting piece of information when considering energy eligibility is the dissemination level of the physical energy for which the GC is issued. Physical energy dissemination may be categorised as:
- consumed by the operator of the Production Device,
- injected into a regulated distribution or transmission system,
- injected into a private grid, and
- transport unspecified (and not physically consumed by the operator of the Production Device).

Requirements
- GCs shall state the dissemination level (for electricity Certificates) of the physical energy for which the Certificate is issued.

ii) Definition of Auxiliary Demand

Context and Definitions
Where the transfer of GCs takes place across registries or Domains, a number of questions arise:
- Are GCs in the transfer perimeter issued under the same definition of qualifying output?
- Does GC issuance take place for gross or for net energy production?
- How is the consumption of production auxiliaries accounted for?
- How is “net” energy defined?

All these factors in turn influence the number of GCs that can be issued.

Existing EAC Schemes have rules regarding the definition and inclusion or exclusion of auxiliaries in the eligibility of energy for EAC issuance. If GCs are to be transferable between Domains with differing EAC Schemes, particular attention should be paid to aligning the prevailing definitions of ‘qualifying output’ and ‘auxiliaries’. For example, if in one GC Scheme GCs are issued for the gross output of a Production Device, and in another for its net output, a producer in the second system will receive fewer Certificates for the same overall produced energy.

Mechanisms may need to be put in place to ensure equal treatment across markets, e.g. cancelling an amount of Certificates in accordance with the difference in “qualifying output” in the involved Domains. Differences between the definitions of gross and net in interacting Domains may have to

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18 e.g. a paper mill with its own Production Device Issues EACs in order to declare renewable consumption
be investigated in detail. The production eligible for issuance is to be set in such a way, that consumers will maintain their trust in the system.

Requirements

- For interconnected GC Schemes, a high-level definition of net eligible energy production for GC issuance shall be harmonised.
- Auxiliary energy needed to produce the output energy shall be deducted from the output when determining the qualifying output for the issuance of GCs, unless it is proven that this auxiliary energy has been produced on the site of the generation facility, that no Certificates have been issued for it, and that its Attributes have not been otherwise disclosed.

iii) Primary Energy Sources

Context and Definitions
The source of energy is an essential Attribute of energy production, and is of key interest when considering energy eligibility. Certain existing certification systems are restrictive about the energy sources which are eligible for the generation of Certificates. However, such restrictions limit the ability of consumers to fully understand their energy sourcing and prevent the roll out of full disclosure mechanisms. Moreover, including fossil fuel generation sources has a Use Case for carbon accounting purposes. Ultimately, excessive restrictions of primary energy sources eligible for issuing of GCs could hinder their usefulness.

Requirement
- GCs should be Issued for any primary energy source, with any restrictions being left to the Producer, consumer or regulatory framework.

iv) T&D losses and congestion

Context and Definition
It should be noted that EnergyTag will not standardise how Transmission and Distribution losses or congestion are dealt with at this stage. However, as with other Issues, should this be required by the market in the future, EnergyTag could play a role in facilitating their treatment.

Requirement
- T&D losses and congestion should be dealt with as they currently are in the corresponding EAC Scheme.
Annex
## Glossary of Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>Account</td>
<td>A record of the Certificates held on a Registry by a company or individual.</td>
</tr>
<tr>
<td>Account Holder</td>
<td>The person in respect of whom an Account is maintained on a GC Registry.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Data item specifying the characteristics of an energy unit produced by a Production Device in terms of the input(s) used and/or the details of that Production Device and production process.</td>
</tr>
<tr>
<td>Avoided Emissions</td>
<td>Emission reductions that occur outside a product’s life cycle or value chain, but as a result of the use of that product.</td>
</tr>
<tr>
<td>Beneficiary</td>
<td>The person (usually the consumer) that ultimately benefits from EAC/GC Cancellation.</td>
</tr>
<tr>
<td>Bidding Zone</td>
<td>A bidding zone is the largest geographical area within which market participants are able to exchange energy without capacity allocation. For example, bidding zones in Europe are currently defined according to differing criteria. The majority are defined by national borders (e.g., France (FR) or the Netherlands), however, some are larger than national borders (e.g., Austria, Germany and Luxembourg or the Single Electricity Market for the island of Ireland) and some are smaller zones within individual countries (e.g., Italy, Norway or Sweden). In the US bidding zones are analogous to market zones where the locational marginal price is the same electricity (e.g., NYISO-Zone D in NYISO).</td>
</tr>
<tr>
<td>Cancel</td>
<td>(European term - in the US “Retire” is normally used, while the I-REC Standard uses “Redeem”); To use a Certificate as proof of the Attributes (source, production time, etc.) of supplied energy and to prevent it being used again for this purpose or transferred to another Account.</td>
</tr>
<tr>
<td>Certificate</td>
<td>A record or guarantee (in any form including an electronic form) in relation to the attributes of the energy consumed, and/or the method and quality used, in the production of a quantity of energy.</td>
</tr>
<tr>
<td>Consumer</td>
<td>The final beneficiary of GC/EAC Cancellation and potentially the user of associated consumed energy.</td>
</tr>
<tr>
<td>Consumption Point</td>
<td>Location of energy consumption. For the electricity Energy Carrier, the Consumption Point is a separately measured grid access point at which electricity is consumed.</td>
</tr>
<tr>
<td>Consumption Verification Area</td>
<td>The geographic area or market sector containing the Consumption Points for which a Consumption Verification Body has responsibility for verifying that Granular Certificates (GCs) have been cancelled against consumption.</td>
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## Glossary of Terms

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<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td><strong>Consumption Verification Body</strong></td>
<td>An organisation checking that Granular Certificates (GCs) are cancelled against the energy consumption measured at one or a group of multiple Consumption Points in compliance with the guidelines in chapter 3. This organisation can be a GC Issuer, or a different organisation such as an auditor.</td>
</tr>
<tr>
<td><strong>Domain</strong></td>
<td>The geographic area or market sector containing the Production Devices for which an EAC Issuing Body and/or an GC Issuer has exclusive responsibility for a certificate system.</td>
</tr>
<tr>
<td><strong>Double Counting</strong></td>
<td>See detailed definition in chapter 1.2 of the GC Scheme Standard.</td>
</tr>
<tr>
<td><strong>EAC Issuing Body</strong></td>
<td>An EAC Issuing Body is an organisation responsible for the administration of the existing EAC Scheme within a Domain for an Energy Carrier, that operates regardless of any interrelation with EnergyTag.</td>
</tr>
<tr>
<td><strong>EAC Scheme</strong></td>
<td>The arrangements for the creation, administration, and usage of Energy Attribute Certificates.</td>
</tr>
<tr>
<td><strong>e-Fuel</strong></td>
<td>Fuels that are made by storing energy from renewable sources in the form of liquid or gaseous fuels.</td>
</tr>
<tr>
<td><strong>Emission Factor</strong></td>
<td>A unique value for determining an amount of a greenhouse gas emitted for a given quantity of activity (e.g. metric tons of carbon dioxide emitted per barrel of fossil fuel burned).</td>
</tr>
<tr>
<td><strong>Energy Attribute Certificate (EAC)</strong></td>
<td>A generic term for a unique transferable electronic record or guarantee created to provide to a consumer evidence of the characteristics of a specific unit of energy conveyed by an Energy Carrier and/or the method and quality of its production. Examples include a Guarantee of Origin (GO) or a Renewable Energy Certificate (REC).</td>
</tr>
<tr>
<td><strong>Energy Carrier</strong></td>
<td>Means of conveying energy – this can be electricity, gas, hydrogen, or heating/cooling.</td>
</tr>
<tr>
<td><strong>EnergyTag Initiative</strong></td>
<td>The non-profit organisation that oversees the creation of these EnergyTag requirements and guidelines and promotes the use of certificate schemes with a time granularity of a maximum of one hour.</td>
</tr>
<tr>
<td><strong>Expire</strong></td>
<td>To make a Certificate ineligible for Transfer or Cancellation as a consequence of the passage of a given period of time since the production of the associated energy.</td>
</tr>
<tr>
<td><strong>Geographical Matching</strong></td>
<td>Associating the geographical location of energy production or storage which has been recorded on a GC at its issuance, with the geographical location of energy consumption and for which the GC is cancelled. For example, Geographical Matching may take place within physically interconnected zone(s) or bidding zone(s).</td>
</tr>
</tbody>
</table>
| Geographical Matching Granularity Level | The three levels of Geographical Matching granularity, starting with the highest level of granularity moving to the lowest:  
- Single Bidding Zone Level  
- Aggregated Bidding Zone Level,  
- Interconnected Zone Level. |
<p>| Granular Certificate (GC) | A Granular Certificate compliant with EnergyTag is a Certificate relating to the characteristics of energy produced during a period of one hour or less, issued in compliance with the requirements and rules of operation of the EnergyTag GC Scheme Standard. |
| Granular Certificate Consumer (GC Consumer) | An energy consumer, a supply company or any other party on their behalf, for whom GCs are cancelled to prove the attributes of their energy consumption. |
| Granular Certificate Issuer (GC Issuer) | A Granular Certificate Issuer is an organisation responsible for the administration of the Granular Certificates within a Domain for an Energy Carrier, ensuring avoidance of double counting of the Attributes represented by the Granular Certificates it administers throughout their lifetime. |
| Granular Certificate Platform | A software service which maintains and/or accesses a GC Registry to provide GC market enabling services such as inventory management, consumption matching or trading. |
| Granular Certificate Scheme (GC Scheme) | The arrangements for the creation, administration, and usage of Granular Certificates. |
| Granular Certificate Validity Period | The period of time, ex-post, in which participants may buy and make claims using GCs. |
| Guidelines | Refers to the EnergyTag GC Use Case Guidelines. |
| Issue / Issuance | The process of creating a GC/EAC as a record on a Registry. |
| Market Zone | A set of geographical zones and/or virtual zones often having the same zonal electricity price. This could be a single bidding/price zone or potentially an aggregation of contiguous bidding zones. |
| Measurement Body | An organisation responsible for measuring the energy produced by or input to a Production Device, and/or the energy consumed at a Consumption Point. |
| Producer | The owner of a Production Device which is valid for GC Issuance. |
| Product Verification Body (PVB) | An optional Role (similar to a Consumption Verification Body) describing a body that verifies products based on Granular Certificates. |</p>
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<tr>
<td>Production Device</td>
<td>Separately measured facility for transferring energy from a primary energy source into an Energy Carrier or from one Energy Carrier to another – for instance, a power station or a gasifier. The operator of a Production Device is called the Producer.</td>
</tr>
<tr>
<td>Production Granular Certificate</td>
<td>A GC issued directly from a production device as opposed to a Storage Discharge GC.</td>
</tr>
<tr>
<td>Power-to-X / PtX</td>
<td>The term is used to describe applications where electricity is converted into another energy form/carryer in Power-to-X applications, X being Hydrogen, Steam or an eFuel.</td>
</tr>
<tr>
<td>Registry / GC Registry / EAC Registry</td>
<td>A database administered by an EAC Issuing Body or GC Issuer and recording the characteristics of the Production Devices for which that Issuing Body or GC Issuer is responsible, and the Accounts and the Certificates held in them.</td>
</tr>
<tr>
<td>Redeem (I-REC term - in Europe “Cancel” is normally used, while in the USA “Retire” is used)</td>
<td>See Cancel</td>
</tr>
<tr>
<td>Reservoir</td>
<td>Refers to the storage device’s inventory of records at time “t” resulting from record charging that are available for allocation to storage discharge records. This mechanism is needed to record the information of the SDRs that are used to prove the attributes of the energy input into storage.</td>
</tr>
<tr>
<td>Retire (US term - in Europe “Cancel” is normally used, while I-REC uses “Redeem”)</td>
<td>See Cancel</td>
</tr>
<tr>
<td>Role</td>
<td>A liable entity in a GC Scheme.</td>
</tr>
<tr>
<td>Standard</td>
<td>Refers to the EnergyTag GC Scheme Standard.</td>
</tr>
<tr>
<td>Storage Charge Record (SCR)</td>
<td>Registry record of energy charged to storage in a time interval.</td>
</tr>
<tr>
<td>Storage Device</td>
<td>Separately measured device for storing energy.</td>
</tr>
<tr>
<td>Storage Discharge Record (SDR)</td>
<td>Registry record of energy discharged to storage in a time interval.</td>
</tr>
<tr>
<td>Storage Discharge GC (SD-GC)</td>
<td>A GC issued following Storage discharge in compliance with all necessary requirements in both the Standard and Guidelines.</td>
</tr>
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<td>**Annex</td>
<td>Glossary of Terms**</td>
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<tr>
<td>-----------------</td>
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</tr>
<tr>
<td><strong>Temporal Matching</strong></td>
<td>Associating the period of time during which energy is produced or stored and which has been recorded on the GC at its issuance with the corresponding time at which the GC is cancelled and the energy is consumed. The time interval is equal to or less than 60 minutes and evidence of energy production and consumption is provided by GCs.</td>
</tr>
<tr>
<td><strong>Timestamp</strong></td>
<td>The date and time when an event happened in the format (UTC “HH:MM:SS, DD/MM/YYYY” e.g. “00:00:00 01/01/2021”).</td>
</tr>
<tr>
<td><strong>Transfer</strong></td>
<td>The handover of a Certificate from one Account to another, whether on the same or on another Registry.</td>
</tr>
<tr>
<td><strong>Use Case</strong></td>
<td>A scenario of a possible usage of GCs.</td>
</tr>
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## Acronyms

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<td>AML</td>
<td>Anti-Money Laundering</td>
</tr>
<tr>
<td>API</td>
<td>Application Programming Interface</td>
</tr>
<tr>
<td>CFT</td>
<td>Combatting the Financing of Terrorism</td>
</tr>
<tr>
<td>EAC</td>
<td>Energy Attribute Certificate</td>
</tr>
<tr>
<td>EECS</td>
<td>European Energy Certificate System</td>
</tr>
<tr>
<td>EU ETS</td>
<td>European Union Emissions Trading System</td>
</tr>
<tr>
<td>GC</td>
<td>Granular Certificate</td>
</tr>
<tr>
<td>GHG</td>
<td>Greenhouse Gas</td>
</tr>
<tr>
<td>GO</td>
<td>Guarantee of Origin</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Positioning System</td>
</tr>
<tr>
<td>I-REC</td>
<td>The International REC Standard</td>
</tr>
<tr>
<td>KYC</td>
<td>Know-Your-Customer</td>
</tr>
<tr>
<td>LEA</td>
<td>Law Enforcement Agency</td>
</tr>
<tr>
<td>MTIC</td>
<td>Missing Trader Intra-Community</td>
</tr>
<tr>
<td>PPA</td>
<td>Power Purchase Agreement</td>
</tr>
<tr>
<td>PtX</td>
<td>Power-to-X</td>
</tr>
<tr>
<td>PVB</td>
<td>Product Verification Body</td>
</tr>
<tr>
<td>REC</td>
<td>Renewable Energy Certificate</td>
</tr>
<tr>
<td>RPS</td>
<td>Renewable Portfolio Standard</td>
</tr>
<tr>
<td>SCR</td>
<td>Storage Charge Record</td>
</tr>
<tr>
<td>SDR</td>
<td>Storage Discharge Record</td>
</tr>
<tr>
<td>SD-GC</td>
<td>Storage Discharge Granular Certificate</td>
</tr>
<tr>
<td>UTC</td>
<td>Coordinated Universal Time</td>
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</table>
## Contributors

### Authors

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# Chapter Authors

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## Chapter 1: EnergyTag Standard for GC Schemes

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Supporting Organisations

3Degrees

acciona

ai

advanced

infrastructure

aes

Air Liquide

ALTEA

energy.

Alter

Grids

axpo

Baringa

BLOK-Z

ECOHZ

eex

certiq

centrica

CFEX

CATF

CLEAN AIR

TASK FORCE

cleartrace

climate

matters

Constellation

Directional

EIT

InnoEnergy

electricityMap

Electron

ElectroRoute

Elexon

Elia group

emergi

Eneco

Enel

E4D

Energy for Development

EnergyTag