



Proposal for a revision of EN16325



Technical support for RES policy development and implementation.

Establishing technical requirements & facilitating the standardisation process for guarantees of origin on the basis of Dir (EU) 2018/2001

Task 2

Developing Technical requirements for the extended coverage of GO

Part 2 (VERSION 2):

Draft revision proposal for the EN16325 standard on guarantees of origin related to energy

based on the original text: EN 16325 (2013+A1:2015)

Guarantees of Origin related to energy

Authors: Remco Van Stein-Callenfels, Katrien Verwimp, Phil Moody, Markus Klimscheffskij, Attila Kovacs, Flore Belin, Wouter Vanhoudt, Frederic Barth, Saul Pedraza, Marko Lehtovaara, Adam White

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0 Introduction

0.1 General

European Standard CEN EN 16325 sets out how Guarantees of Origin (GOs) are standardised in line with relevant EU directives and existing voluntary schemes. The aim of the standard is, therefore, to create a standardised transferable GO that can be used to facilitate the disclosure of the origin of energy to its final customer and the identification of particular energy sources, including by labelling schemes. A GO is an instrument for proving the origin of supplied energy to a final customer.

There is a growing demand from final customers for energy that can be reliably certified. Electricity suppliers are required to provide reliable disclosure information to final customers on the origin of the energy they supplied them. The EU GO system already meets many of the needs of these stakeholders and revising the CEN EN 16325 standard on GOs can further strengthen the current system.

The CEN EN16325 standard on GOs is being revised to ensure that it fulfils the requirements of the recast Renewable Energy Directive (2018/2001/EU), the Directive on common rules for the internal market for electricity (2019/944/EU), the Directive on Energy Efficiency (2018/844/EU) and other relevant European laws. The revised standard will provide a basis for the further development of energy attribute tracking in the EU, to achieve greater harmonisation between the national systems of EU Member States and EEA countries.

GOs are certificates which are tracked through a book and claim system and which thereby underpin the trading and disclosure of energy. The Renewable Energy Directive and Directive on Energy Efficiency require Member States to recognise a GO issued by another Member State unless it has “well-founded doubts about its accuracy, reliability, or veracity” (Art. 19.9). Further, the system should prevent double-counting and be resistant to fraud. Therefore, a European Standard for GOs for all member states is important. As per the revised Renewable Energy Directive, the content of the standard applies to energy from renewable sources, be it “electricity; or gas, including hydrogen; or heating or cooling” (Art. 19.7). The content of this standard can also be applied for energy from non-renewable sources.

The elaboration and publication of European Standards will allow certification bodies to develop their activities on consensual and recognised practices and this will increase the credibility of the certificates they deliver.

0.2 Description of the Guarantee of Origin system and its components

Basic description of the GO system and its components

The purpose of a guarantee of origin (GO) system is to track the attributes of a given megawatt-hour of energy from generation/production to consumption. In doing so, the system allows final customers to know the origin of the energy supplied to them. In turn, this enables those final customers to choose to consume/use energy from renewable sources. This is accomplished by energy producers or generators requesting the issuance of a GO for each MWh of energy they produce/generate. These GOs can then be traded until they are cancelled by/for a final customer. This cancellation allows the final customer to state that they have used this unit of energy. The underlying goal of GOs is to facilitate consumer choice, which indirectly could act as a market incentive for renewable production.

The guarantee of origin system for electricity was first legislated for at European level in Article 5 of 2001/77/EC. This article was later amended by Article 15 of the Renewable Energy Directive 2009/28/EC (often referred to as RED I). Article 15.1 states that “...Member States shall ensure that the origin of electricity produced from renewable sources can be guaranteed... for the purpose of proving to final customers the share or quantity of energy from renewable sources in an energy supplier’s energy mix”. Renewable Energy Directive 2018/2001/EU, (often referred to as REDII,) in Art. 19 extended the scope of GOs to cover gas (including hydrogen) as well as heating and cooling. It also set GOs as the sole

instrument for disclosure of renewable energy origin of electricity, where before other means of tracking could, in principle, also have been used.

Article 14.10 of the Energy Efficiency Directive determines that upon request, a Member State shall issue a GO for Electricity produced from High-Efficiency Cogeneration, for the purpose of demonstrating that such production method leads to savings of primary energy used.

At the time of revision of this EN16325 standard in 2020, the European energy market has adopted the GO system for electricity initiated by the first Renewable Energy Directive (2001/77/EC) and updated in the second and third one (2009/28/EC and 2018/2001/EC) .

A guarantee of origin system consists of certain basic components, which relate to the verification of the underlying information, accurate generation of data, secure and electronic GO transfer as well as the use of GOs for cancellation and disclosure. These basic components ensure accurate attribute tracking and the avoidance of double disclosure; when the same unit of (renewable) energy is disclosed more than once. Figure 1 describes how these basic components relate to the GO life-cycle.

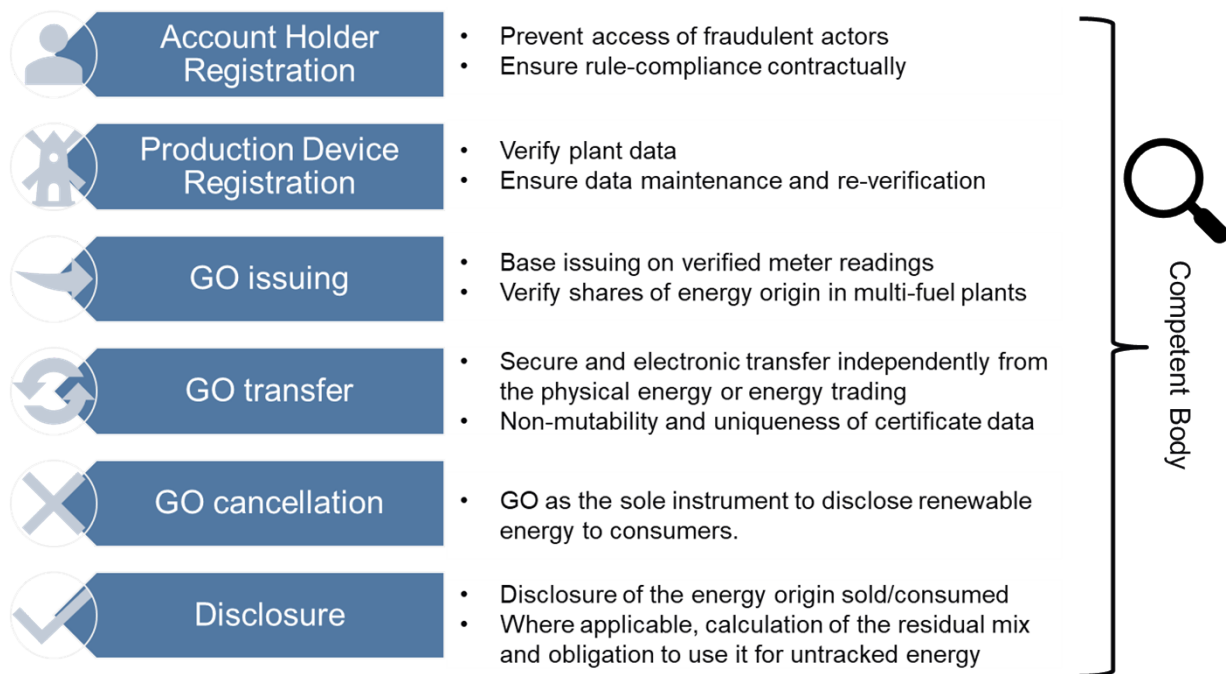


Figure 1 Main components of a GO system

Account Holder registration

GOs are held in accounts of electronic registries which are managed by Issuing Bodies. Only legitimate companies (legal persons) with the intention of participating in the GO market (e.g. producers, traders and/or energy suppliers) are permitted to register as GO account holders. By setting a registration process and required documentation for account holders, the Competent Body of each country makes the necessary steps to block fraudulent actors accessing the market. Some countries may, at their discretion, limit access to the GO registry further to e.g. to energy market actors alone. After a successful registration process, an account holder gains secure access to its GO account(s).

Production Device registration

Issuing of GOs is based on measured energy output from registered Production Devices. For this purpose, all Production Devices, the owner/operator of which requests issuance of GOs, are registered in the GO registry. Prior to the approval of a registration, a Competent Body or its agent verifies the registered standing data (such as age, capacity, location, technology, energy medium) of the Production Device. Periodically, the registration information is re-verified to ensure the up-to-date accuracy of the data .

GO Issuing

Issuing of GOs is made periodically (typically every month) for measured energy output from registered Production Devices. In most countries, the energy output data is derived from Transmission or Distribution System Operator’s data (e.g. imbalance settlement), which automatically portrays the accurate amount of energy production netted from auxiliary consumption. Where (rarely) this is not the case, the production data might come straight from the producer, in which case the Competent Body takes the necessary additional steps to ensure the accuracy of the data (e.g. by verification of the metering diagram).

For Production Devices producing energy from multiple energy sources (e.g. certain thermal power plants), the measured total energy output is distributed to each energy source through a verified declaration of the shares of different energy sources used in production. GOs are then issued for output from each energy source in proportion to their share so that each GO only records one energy source. The declaration process might cause a time lag of several months for the issuance of GOs from multifuel plants.

Issued GOs are deposited on the GO Account(s) of registered Account Holders. Each GO represents a value of 1 MWh of energy and the information content of a GO, the attributes of the unit of energy, consists of the standing information of the Production Device as well as information specific to the production such as the energy source, production time, received support). Once the GO is issued, the information contained on a GO is immutable (apart from possible error correction). The Competent Body ensures through contractual and other means that the same energy origin is not tracked by any other means (e.g. contractually or through another tracking system).

GO Transfer

Account Holders may access their GO Accounts to perform transactions such as the transfer of a GO to another Account Holder’s account. GOs may be transferred independently from the transfer of the energy to which they relate (2018/2001/EC, preamble 55).

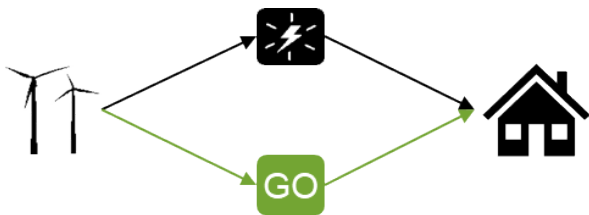


Figure 2 Transfer of GOs fully decoupled from physical energy

GO Cancellation

The Cancellation (use) of a GO enables a claim on the origin of the energy supplied to a final customer. Cancellation hence means the realization of the value of the GO for the Disclosure of energy origin to a final customer. An Account Holder who performs a Cancellation unambiguously designates the sold/consumed energy to which the Cancellation relates. This may imply a certain (renewable) energy product or the generic mix of a supplier in a given year.

GO transfers between Account Holder’s in countries between which no communication interface exists are handled usually through a process called ex-domain cancellation, where a GO is cancelled in one country for disclosure of energy origin of energy sold or consumed in another country.

Energy disclosure and residual mix

Each electricity supplier is obliged to disclose to its customers the energy origin of electricity sold (2018/2001/EU, Article 19.8). This process, called “Disclosure”, is the purpose of GOs. GOs are used by energy suppliers, and, in some countries, by consumers to self “green” the “regular” energy supplied to them by a supplier or directly purchased from e.g. an energy exchange. Sale of energy from renewable energy origin shall take place accompanied by the cancellation of a GO¹.

The legal basis for a similar disclosure obligation exists to some extent for district heating and cooling (see 2018/2001/EU, Article 24. 1) and can be found for other types of energy in 2018/2001/EU, Article 19. 8 paragraph 2. In order to avoid double claims on the origin of the same amount of energy, a disclosure scheme linked to the cancellation of guarantees of origin is needed for all energy carriers for which a GO system is introduced. No requirement exists for disclosure of the energy origin of gas at the time of drafting this revised standard.

Residual Mix is the energy source mix excluding tracked energy generation attributes from the generation mix. The concept of residual mix is an integral part of any energy origin disclosure system based on the book-and-claim principle. The introduction of a GO (= book-and-claim) system provides a way to supply energy with specified attributes, but also impacts the remaining attributes of energy supplied without a GO. A residual mix is a logical consequence of implementing energy attribute tracking as it ensures that the attributes represented by GOs are not double disclosed to other consumers through an implicit mix. The use of uncorrected generation statistics for purposes of disclosure should be avoided. For the time being a residual mix is only mandatory for electricity, but the same methodology should be extended for other energy carriers as GO and disclosure systems for other energy carriers develop.

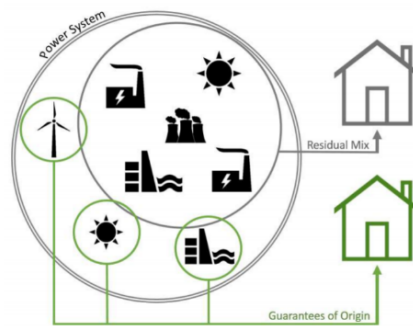


Figure 3 Electricity residual mix

Electricity disclosure information provided by energy suppliers to their customers is verified by a Disclosure Supervisory Body to ensure a) that a sufficient amount of GOs has been cancelled corresponding to the suppliers’ disclosure statements and b) that for the remaining part of disclosure the residual mix² is correctly applied.

0.3 Complementing EN16325 for agile response in changing circumstances

This standard covers the essential building blocks for a reliable system of guarantees of origin, and a basis for reliable disclosure of the origin of energy. For efficiency of operation and deeper quality assurance,

¹ Only exceptions include governmental support schemes and remaining shares of renewable energy attributes in the residual mix.
² or possible contractual tracking for non-renewable attributes.

harmonisation of detailed processes is recommended, although such details may require frequent updates e.g. to keep pace with developments in the market, and national policies.

There is need for a trade-off between the stability of a formalised standard and the more flexible additional agreements that can be made between issuing bodies.

Ideally, this is done in a single platform where issuing bodies share experiences and concerns, and jointly make decisions on the updates. A clear process for such decision-making between GO issuing bodies, enables agile response to changing circumstances for GO system management.

1 Scope

This European Standard specifies requirements for Guarantees of Origin of Electricity, Hydrocarbon Gas, Hydrogen, and Heating & Cooling. This standard will establish the relevant terminology and definitions, and requirements for the registration, issuance, transfer and cancellation of GOs in line with the following directives: Renewable Energy Directive (2018/2001/EU), the Directive on common rules for the internal market for electricity (2019/944/EU), the Directive on Energy Efficiency (2018/844/EU) and other relevant European Union law. This standard will also cover measuring methods and auditing procedures.

Out of scope of this European Standard is GO recognition by Member States.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO14067_2018 Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1 Account

A record on a Registration Database relating to a particular Account Holder in which GOs are held

3.1.2 Account Holder

A person or organisation in respect of whom an Account is maintained on a Registration Database

3.1.3 Affiliate

A stakeholder assigned by the expression “related undertaking” by the IEM Directive (in relation to the electricity market) and Directive (EU) 2009/73 (in relation to the gas market)

3.1.4 Alteration

The correction by the Competent Body of any data of a GO where an error has been introduced upon issuing the GO or in the course of the processing the GO

3.1.5 Auxiliary

An item of the Production Device that is required for the functional operation of that Production Device that consumes energy

Note: An Auxiliary may consume Output produced by that Production Device.

Note: An Auxiliary may consume energy in the form of any Energy Carrier.

3.1.6 Authorised Measurement Body

A person or organisation responsible for collecting and determining (on behalf of the Registrant) measured values of the Import and Export Meters of a Production Device, and which has been either:

- appointed under a Domain GO Scheme; or
- appointed by a Competent Body as its Agent;

for the purpose of measuring energy

3.1.7 Attribute

Data specifying the characteristics of energy produced by a Production Device in terms of the Input(s) used and/or the details of that Production Device and production process

3.1.8 Biomass

The biodegradable fraction of products, waste, and residues from biological origin from agriculture, including vegetal and animal substances, from forestry and related industries, including fisheries and aquaculture, as well as the biodegradable fraction of waste, including industrial and municipal waste of biological origin

3.1.9 Cancel

To mark, at the request of the holder of the account on which it is held, a GO as having been used for the purpose of Disclosure of consumed energy, and to prevent it from subsequently being:

- transferred to another account; or
- marked again in this way

3.1.10 Cancellation Statement

An electronic, non-transferrable receipt which provides evidence of the cancellation of one or more GOs for the purpose of Disclosure of the Attributes of those GOs for the beneficiary or beneficiaries of the cancellation

3.1.11 Cogeneration

The simultaneous generation in one process of thermal energy and electrical and/or mechanical energy in a single process

3.1.12 Competent Body

A body duly authorised under the laws and regulations of any state (and, as the case may be, region) to exercise or discharge any legislative, governmental, regulatory, administrative or supervisory function associated with the administration of a Domain GO Scheme

3.1.13 Competent Body's Agent (or Agent)

A person or organisation engaged by a Competent Body to perform on its behalf any of its functions associated with the administration of a Domain GO Scheme

3.1.14 Consumption Declaration

A declaration with respect to the Inputs of a Production Device (including Energy used in storing energy to be used by that Production Device)

3.1.15 Conversion Issuance

The Issuance of a GO for Output resulted from Energy Carrier Conversion, and for which GOs representing the Attributes of the Input to that Production Device have been cancelled

3.1.16 Cooling

An Energy Carrier which has the purpose of deducting thermal energy

3.1.17 Disclosure

Provision of information to a final customer on the share or quantity of the energy supplied to them as having specific Attributes

3.1.18 Disclosure Authority

Competent Body charged with supervision of origin disclosure in its Domain, comprising tasks like e.g.:

- Verifying the accuracy and veracity of Disclosure Statements; and
- Applying corrective measures with regard to Disclosure Statements that do not conform to the requirements of the relevant Domain GO Scheme, and
- Calculating the Residual Mix ,where applicable

3.1.19 Disclosure Statement

Information provided as a result of Disclosure

3.1.20 Domain

A geographic area containing Production Devices with respect to which an Issuing Body is responsible for issuing GOs for the relevant Energy Carrier

3.1.21 Domain GO Scheme (or GO Scheme)

In relation to any Domain, the legislative, regulatory, administrative, supervisory, and contractual framework, establishing a system for issuing, registration, and cancellation of GOs and for Disclosure in that Domain

3.1.22 Domain GO Scheme Participant (or GO Scheme Participant)

A Registrant and/or an Account Holder

3.1.23 Electrical Energy (or Electricity)

Energy made available by the flow of electric charge through a conductor

3.1.24 Energy Carrier

a substance or phenomenon that can be used to produce mechanical work or heat or to operate chemical or physical processes and the means by which it is conveyed; used in this document to collectively refer to Electricity, Heating, Cooling, Hydrocarbon Gas and Hydrogen

3.1.25 Energy Carrier Conversion (or Conversion)

The production of an Energy Carrier from one or more Inputs including at least one other Energy Carrier

3.1.26 Energy Efficiency Directive

Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency

3.1.27 Energy Input Factor

The proportion (relating to the energy content and expressed as a factor of not more than one) of the Output of a Production Device which is from a single type of Input

3.1.28 Energy Storage (or Storage)

Device or system that is used to store energy, where the energy carrier injected into that device or system is the same as the Energy Carrier that flows out of it.

Note: for the purpose of this standard, Energy Carrier Conversion is not to be understood as Energy Storage

3.1.29 Expiry

The cessation of a GO being eligible for Transfer, and subsequently, Cancellation, as a consequence of the passage of a given period of time since the production of the associated Energy. in accordance with section 4.9.4

3.1.30 Export Meter

One or more device(s) and supporting arrangements for determining (in whole or in part) the quantity of Output flowing from a Production Device to the point where the Output is to be made available for trade

3.1.31 GO Issuing Request

A request by the authorised representative of a Production Device to an Issuing Body for the Issue of GOs in respect of that Production Device and a specific period of time

3.1.32 Gross Energy Production

The total Gross Energy production of a Production Device

3.1.33 Guarantee of Origin (or GO)

An electronic document relating to the Attributes for a specific amount of energy Issued by an Issuing Body under a Domain GO Scheme with the purpose of Disclosure.

Note 1 to entry: Guarantees of origin should be used within the framework of Labelling to designate the provider mix and - if a provider sells to an end-consumer with undertaking a product differentiation with a different energy mix (product mix) – also for a designation of the product mix

3.1.34 Heating

An Energy Carrier which has the purpose of adding thermal energy

3.1.35 High-Efficiency Cogeneration

Cogeneration which meets the criteria of >Annexes I and II< of the >Energy Efficiency Directive<

3.1.36 Hydrocarbon Gas

An Energy Carrier consisting of chemical compounds composed mainly of the elements of carbon and hydrogen, which are in gaseous state when they are at 20°C and atmospheric pressure

3.1.37 Hydrogen

An Energy Carrier with a composition of at least 99.9% vol hydrogen; H₂

3.1.38 IEM Directive

Internal Electricity Market Directive, being Directive (EU) 2019/944 of the European Parliament and of the Council and amending Directive 2009/72/EU

3.1.39 Import Meter

one or more devices and supporting arrangements for determining (in whole or in part) the quantity of total Input per Energy Carrier flowing into a Production Device

3.1.40 Input

An amount of energy from a specific energy source or material goods consumed by a Production Device in the production of Output

3.1.41 Issue

The process of creating (as a GO) a record in an Account in a Registration Database

3.1.42 Issuing Body

A Competent Body responsible for:

- registering Production Devices and Account Holders in a Registration Database;
- collecting measured values from Authorised Measurement Bodies;
- issuing GOs; and
- enabling and registering transfers and cancellation of GOs

3.1.43 Label

An Attribute on a GO reflecting that the Output and/or Production Device and/or Input to which a GO relates conforms to a specific set of qualities defined in a Label Scheme, following an agreement between the Issuing Body and the corresponding Label Scheme Operator

3.1.44 Label Scheme

A scheme with criteria independent from the criteria for GO Issuing, that provides assurance that the Output and/or the Production Device to which a GO relates, conforms to specific requirements which are additional to those established in this Standard

3.1.45 Label Scheme Operator

In relation to a Label Scheme, the body responsible for the rules establishing the operation of that Label Scheme

3.1.46 Nett Energy Production

Gross Energy Production of a Production Device as evidenced by measured values collected and determined by an Authorised Measurement Body with reference to its Import and Export Meters and minus the demand of any production Auxiliaries and minus losses and energy consumption that occur before the resulting energy becomes available for trade

3.1.47 Network-compatible gas

A gas which fulfils the technical criteria for injection in the natural gas Distribution or Transmission System of the respective Domain

3.1.48 Originating Production Device

A Production Device which produced the Output to which a GO relates

3.1.49 Output

The amount of energy of a specific Energy Carrier yielded by a Production Device and measured by an Authorised Measurement Body in MWh

3.1.50 Primary Energy Savings

Savings in primary energy that can be attributed to the use of Cogeneration technology, calculated according to Annexes I and II to the Energy Efficiency Directive

3.1.51 Production Auditor

A person or organisation, independent of the Registrant, which has been approved by the relevant Competent Body to examine:

- the information provided by that Registrant in a GO Issuing Request, in order to confirm the accuracy of the Output and, where appropriate, the Consumption Declaration in relation to that GO Issuing Request; and/or
- the Production Device itself, in order to confirm the accuracy of the data held with regard to that Production Device in the relevant Registration Database

Note 1 to entry Such audit is achieved by reference to the records of, or which are made available by, the Registrant (or the owner or operator of the relevant Production Device). Where appropriate, inspection of records may be supplemented by inspection of the relevant Production Device.

3.1.52 Production Declaration

A declaration with respect to the Energy Carrier and quantity of the relevant Output(s) of a Production Device

3.1.53 Production Device

A separately measured device or group of devices that yields one or more Outputs from one or more Inputs, with one specific Technology Type

3.1.54 Production Registrar

A person or organisation, independent of the Registrant, which has been appointed by the relevant Competent Body to assess applications to register Production Devices for the purposes of the Domain GO Scheme

3.1.55 Public Support (or Support)

“Support scheme” (as defined in Article 2, paragraph 5 of the Directive 2018/2001/EC), meaning any instrument, scheme or mechanism applied by a Member State, or a group of Member States, that promotes the use of energy from renewable sources by reducing the cost of that energy, increasing the price at which it can be sold, or increasing, by means of a renewable energy obligation or otherwise, the volume of such energy purchased, including but not restricted to, investment aid, tax exemptions or reductions, tax refunds, renewable energy obligation support schemes including those using green certificates, and direct price support schemes including feed-in tariffs and sliding or fixed premium payments

3.1.56 Registrant

A person in whose name a Production Device is registered in a Registration Database

3.1.57 Registration Database (or Registry)

A database operated by an Issuing Body or its Agent, comprising:

- a) Accounts and the GOs in those Accounts;
- b) details of Production Devices and information provided to the Issuing Body or a third party on its behalf in connection with the registration of those Production Devices; and
- c) details of GOs which have been transferred out of that Registration Database

3.1.58 Registration Functions

The registration of Production Devices and the issuing and registration of GOs in respect of their Output, and the maintenance of records regarding such processes

3.1.59 RES Directive

Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources

3.1.60 Renewable Energy Source (or RES)

Renewable sources as defined in Article 2, subparagraph (1) of the RES Directive, as identified by a Source Type

3.1.61 Renewable Hydrocarbon Gas

Hydrocarbon Gas which is produced by means of Renewable Energy Sources.

Note: There are two types of Renewable Hydrocarbon Gas: Renewable Hydrocarbon gas of Biological Origin and Renewable Hydrocarbon Gas of Non-biological Origin

3.1.62 Renewable Hydrocarbon Gas of Biological Origin

Hydrocarbon Gas in which the energy content is derived from biomass, landfill gas, sewage treatment plant gas and biogas

3.1.63 Renewable Hydrocarbon Gas of Non-biological Origin

Hydrocarbon Gas which is produced by means of renewable energy sources other than biomass, landfill gas, sewage treatment plant gas and biogas (wind, solar, hydropower, etc.)

3.1.64 Residual Mix

For a given energy carrier, the mix of energy sources and other Attributes of the energy supplied in a Domain in a given period of time, excluding energy for which GOs were cancelled, and excluding energy covered by other means of explicit tracking

3.1.65 Source Type (of an Input)

Energy source of an Input consumed by a Production Device

Note 1 to entry: See Normative Annex A for clarification and further information.

3.1.66 Stored Energy

Energy that is stored in a device or system for which the Energy Carrier injected into that device or system is the same as the Energy Carrier that flows out of it.

Note: for the purpose of this standard, energy converted from another Energy Carrier, is not to be understood as Stored Energy

3.1.67 Transfer Request

A request made by an Account Holder (or by any person or organisation whom the Account Holder has duly authorised) to transfer one or more GOs held in its Account which specifies:

- a) the identity of the relevant GOs;
- b) the identity of the Account in which such GOs are held;
- c) the identity of the Transferee's Account; and
- d) the Registration Database on which the Transferee's Account is held

3.1.68 Transferee

An Account Holder whose Account has been nominated in a Transfer Request to receive GOs from the Transferor

3.1.69 Transferor

An Account Holder which has requested the Competent Body in whose Registration Database a GO is held on its Account to transfer that GO to another Account

3.1.70 Technology Type (of a Production Device)

A type of technology used by the Production Device in generating Output from Input

Note 1 to entry: See Normative Annex B for clarification and further information.

3.1.71 Useful Heat

Heat produced in a Cogeneration process to satisfy an economically justifiable demand for heating or cooling as intended by the Energy Efficiency Directive

3.1.72 Withdrawal

The correction by an Issuing Body of an error with regard to a GO held in its Registry by removal of that GO from an Account, or through amendment of its status in a way that it is no longer Tradeable and can no longer be cancelled

4 Generic Rules for guarantees of origin (for all energy carriers)

4.1 Main objectives

This European Standard provides guidance:

- to authorities for the design of Domain GO Schemes; and
- to Competent Bodies and their Agents and stakeholders in GO Schemes as to the manner in which they should discharge their responsibilities with respect to GO Schemes.

4.2 Principles

This European Standard shall support and promote a set of long-term objectives for the development of Domain GO Schemes, being:

a) Uniqueness:

- 1) No more than one GO shall be Issued and subsequently Cancelled in respect of the same unit of Output; and
- 2) The regulatory framework and arrangements for Disclosure shall ensure that where a GO is issued in respect of an amount of Output, only cancellation of that GO shall constitute proof of the Attributes of that unit of energy for the purpose of Disclosure; and
- 3) A GO shall be used solely for the purpose of Disclosure and shall be Cancelled to that effect; and
- 4) Duplication of the same GO shall be avoided over its whole life cycle.

b) Immutability

- 1) The Attributes of a GO shall not be changed in any way once a GO has been issued, except:
 - i) to correct an error; or
 - ii) to indicate that it has ceased to be eligible for Transfer and Cancellation through Expiry, its prior Cancellation or Withdrawal.

c) Ownership of GOs:

- 1) The Account Holder of an Account shall be treated as the owner of the GOs in that Account; and
- 2) An Account Holder may not transfer GOs on behalf of a third party which is not an Account Holder, except if this Account Holder has been designated by the Owner of the GOs issued for Output produced from the Originating Production Device to manage its GOs on its behalf; and

3) The ownership of the GOs may not be transferred to any person that does not hold an Account on a Domain GO Scheme.

d) Operational reliability and record keeping:

1) Operational risks arising in the Issue, transfer, and Cancellation processes for GOs should be identified and mitigated through the development of appropriate systems, controls, and procedures;

2) Systems shall be reliable and (cyber)secure, and have adequate capacity;

3) Contingency plans and backup facilities should be established to allow for timely recovery of records and operations and completion of the transfer process;

4) Records which are sufficient to enable resolution of disputes relating to such matters as ownership of and eligibility for GOs should be kept of all material communications between Competent Bodies and GO Scheme Participants regarding the registration of Production Devices and the Issue, transfer and Cancellation of GOs; and

5) Competent Bodies shall ensure that an electronic record is kept for each GO that has been held in their registry at least during the past 5 years, of:

- Each account or accounts in which it has been held and the period during which it was held in that account or accounts; and
- Where it has been imported, the country or region from which it was imported; and

where a GO is exported, then the record shall also show the Domain to which it has been exported.

e) Protection of Account Holders:

1) Accounting practices and safekeeping procedures shall be employed that fully protect the GOs in Account Holders' Accounts; and

2) Competent Bodies and Account Holders shall co-operate in seeking to minimise the risk of an unauthorised instruction with respect to a GO being acted upon.

f) Access and transparency:

1) Participation in GO Schemes should be based on objective and publicly disclosed criteria so as to achieve fair and open access to existing and potential GO Scheme Participants; and

2) A list of Account Holders which are not natural persons shall be made publicly available and include information on admission/termination dates, GO Schemes where the company is active, domicile of the company and business registration number;

3) Access to details of a GO shall be made available to the Account Holder of the Account in which it is held; and

4) Competent Bodies shall ensure that the purpose of a GO is clearly communicated to GO Scheme Participants so that they may better inform consumers.

g) Integrity:

- 1) Competent Bodies shall implement due diligence measures to ensure that GO Scheme Participants. Competent Bodies (or their Appointing authorities) have sufficient knowledge to deny access to their Domain GO Scheme when they have sufficient grounds to suspect that prospective participants represent a threat to the integrity of any Domain GO Scheme or could use their Account to violate any EU law; and
 - 2) Competent Bodies shall implement effective and regular monitoring of their Domain GO Schemes to ensure that the activity of Account Holders is compliant with the requirements of this standard and with EU laws.
- h) Communications:
- 1) The systems put in place by Issuing Bodies shall use or accommodate appropriate international communications procedures and standards in order to facilitate effective, efficient, and secure cross-border transfers.
- i) Regulation and oversight:
- 1) Competent Bodies shall be subject to transparent and effective regulation and oversight at a national level in relation to the performance of their obligations under their respective GO Schemes.

4.3 Registration of Competent Bodies and their agents

4.3.1 Appointing authority for Competent Bodies

The appointing authority for Competent Bodies within a Domain shall be the relevant Member State.

4.3.2 Characteristics of Competent Bodies

4.3.2.1 General

A person or organisation shall be entitled to become or remain a Competent Body provided it and all of its Affiliates undertake not to participate (other than in connection with the performance of Registration Functions or associated functions such as metering, inspections, reviews, audits and data collection and aggregation) in or otherwise to distort the competition in markets associated with GOs. The governance of the relevant Competent Body shall be such that its interests and those of its Affiliate(s) in relation to GOs will not materially affect the conduct of the Competent Body in relation to the Domain GO Scheme. Therefore, a Competent Body and its Affiliates shall not own nor hold any beneficial entitlement to any GO, unless:

- a) such GO has been purchased by the Competent Body for the sole purposes of:
 - 1) proving the Attributes of the Energy that it has consumed; or
 - 2) testing its systems, in which case the Competent Body shall hold no more GOs than is strictly required for performing such test; or
- b) an Account Holder in its Registry has defaulted on an undisputed payment to that Competent Body, in which case the Competent Body may hold the GO in order to take appropriate actions in accordance with national law to minimise its losses; or
- c) such GO is issued to and subsequently auctioned by the Competent Body, with the full proceeds being used as determined by national law .

4.3.2.2 Allocation of responsibilities under a GO Scheme in a specific Domain

The provisions of a Domain GO Scheme shall be such that the responsibilities identified in 4.3.2.3 are defined and allocated to one or more Competent Bodies. At any given time, the responsibility for a GO Scheme for Issuing GOs for an Energy Carrier within a Domain shall be allocated to a single Competent Body with responsibility for that Energy Carrier within that Domain. Each Competent Body shall carry out its responsibilities for a specific geographic or geopolitical Domain which does not overlap with any other Domain. A Competent Body may, insofar as its national law allows, appoint one or more Agents in respect of one or more of its responsibilities, provided that both the Competent Body and its Agents (continue to) comply with this European Standard.

4.3.2.3 Responsibilities

The following responsibilities are essential for each GO Scheme to function properly:

- a) issuance and administration of GOs under one or more Directives;
- b) supervision of the accuracy of Disclosure Statements and of publication thereof;
- c) ensuring that the provisions of the Domain GO Scheme are publicly available in English;
- d) ensuring that the following are guaranteed and clearly communicated to Account Holders:
 - 1) the purpose of GOs;
 - 2) provisions regarding the time and manner of Expiry of GOs in its Domain; and
 - 3) provisions regarding the frequency with which the quantity of Output of Registered Production Devices in the relevant Domain shall be determined and recorded, and with which GOs are Issued; and
- e) for each Competent Body, ensuring that it discharges its duties under relevant international and national law and regulations and in accordance with this European Standard, amending its practices in line with any change to international and national laws, regulations and this European Standard;
- f) imposing upon Account Holders legal requirements, remedies and sanctions for breaches of their obligations under the Domain GO Scheme; and where relevant to report to the relevant Competent Body or its Agent any failures by Account Holders to comply with the provisions of the Domain GO Scheme;
- g) deciding on the admission of Account Holders within their Domain, including Accounts suspension in case the Account Holders fails to comply with the provisions of the Domain GO Scheme;
- h) operating a Registration Database in such a manner as to reliably, currently, and accurately capture and record the details of and changes to:
 - 1) Production Devices and Account Holders; and
 - 2) GOs, including their:
 - i) issuance;

- ii) transfer from an Account on its Registration Database to another Account on the same Database or to an Account on the Registration Databases of another Competent Body; and
- iii) Expiry, Withdrawal and Cancellation;
- i) cooperating with other Competent Bodies to ensure the accurate, reliable, and secure transfer of GOs between Accounts held on different Registries;
- j) cooperating with other Competent Bodies and with relevant authorities to prevent fraud;
- k) conducting or commissioning inspections in accordance with the provisions of sections 4.3.5.2, 4.11.3, 4.11.4, 5.2.8, 5.3.6, 5.4.7 of this Standard.

4.3.2.4 Confidentiality

Competent Bodies shall preserve the confidentiality of information provided to them in connection with their roles as Competent Body save to the extent that:

- a) they are implicitly or explicitly required to disclose such information under this European Standard;
- b) they are otherwise authorised to disclose such information by the person to whom a duty of confidentiality with respect to such information is owed; or
- c) they are required to disclose such information by law, including by any direction or request of a Competent Body which it is reasonable for the Competent Body to treat as having the force of law.

4.3.3 Criteria for qualification and entitlements of Issuing Bodies

The appointment criteria in connection with a Domain for an Issuing Body are that:

- a) the Issuing Body has been appointed for the purpose of issuing GOs under the relevant Domain GO Scheme with respect to any Production Device located in the relevant Domain.
- b) where the Issuing Body intends to issue GOs with a Label, the Label Scheme Operator of the relevant Label Scheme has agreed for the Issuing Body to Issue GOs under that Label Scheme in respect of Production Devices in the relevant Domain(s).

The Competent Body is entitled:

- 1) to receive and use such data as is contemplated by this European Standard; and
- 2) with respect to such data, to grant:
 - i) a non-exclusive licence to use it to any other Competent Body to the extent necessary and solely for the purposes contemplated by this European Standard;
 - ii) the right to sub-license the use of such data to each such other Competent Body as necessary solely for those purposes; and
 - iii) the right to grant each such other Competent Body the right to sub-license the use of such data to Account Holders as necessary solely for those purposes;

4.3.4 Appointment of Agents

Subject to the terms of the relevant GO Scheme, a Competent Body may appoint a person or organisation as its agent (a Competent Body's Agent) to discharge any of the obligations imposed on it by this European Standard or its GO Scheme, provided such person or organisation:

- is approved by the relevant authority in relation to such functions;
- accepts its appointment as the relevant Competent Body's Agent;
- agrees to provide such information to other Competent Bodies, and such access to its facilities to representatives of those Competent Bodies, as may reasonably be required;
- agrees (with the Competent Body appointing it as a Competent Body's Agent) to comply with the provisions of this European Standard regarding intellectual property as if it were a Competent Body; and
- meets such other requirements as may be specified for the purposes of this subclause 4.3.4.

Where a Competent Body has appointed a Competent Body's Agent to discharge any of its obligations under this European Standard, then the Agent itself does not become a Competent Body. The Competent Body shall itself remain responsible for the discharge of such functions, and any failure on the part of that Competent Body's Agent to discharge such a function shall be treated for the purposes of this European Standard as a failure on the part of that Competent Body.

The Competent Body remains under all circumstances liable for omissions and actions performed by the appointed agent.

4.3.5 Obligations of Issuing Bodies

4.3.5.1 General

The Issuing Body shall ensure that:

- a) the information received in connection with an application from a prospect participant is complete and accurate; and
- b) the Production Device or the Account Holder meets the qualification criteria for the relevant Domain GO Scheme.

The provisions of each Domain GO Scheme for the registration of Production Devices shall be such that the relevant Issuing Body (or a Production Registrar appointed by it) is entitled to inspect any Production Device in relation to which it has received an application for registration together with records related thereto so as to verify the information provided in connection with that application. In case the requirements listed in 4.4.3 are not fulfilled or if the right to carry out inspections is not met, the application for registration shall be rejected.

4.3.5.2 Verification of information on Production Devices

The Issuing Body shall verify the information provided in connection with an application to register a Production Device in its Registration Database for the purposes of the relevant Domain GO Scheme and ensure for the conduct of an inspection of such Production Device where such is considered to be appropriate by the Issuing Body and where it is defined as appropriate in sections 5.2.8, 5.3.6, 5.4.7.

An inspection of a Production Device is likely to be appropriate where:

- a) the Issuing Body (or Production Registrar) is not familiar with the Production Device;

- b) the Issuing Body (or Production Registrar) is familiar with the Production Device and the information provided in the relevant application does not accord with the Competent Body's (or Production Registrar's) experience and prior information;
- c) the Production Device is technologically novel or complex;
- d) the information in the relevant application cannot otherwise be verified; or
- e) the relevant application relates to a Production Device which is or has previously been registered and specifies significant changes to the Production Device; or
- f) one or more Input(s) identified in 4.4.1.3 f) are of biological and/or fossil origin.

An Inspection may also be appropriate even where such circumstances do not apply, in correspondence to the judgement of the Issuing Body.

4.4 Registration of Production Devices and Account Holders

4.4.1 Application procedure for Production Devices

4.4.1.1 General

Only the owner of a Production Device, or a person or organisation duly authorised by the owner, may file an application for the registration of a Production Device in a Registration Database.

4.4.1.2 Qualification criteria for Production Devices

The qualification criteria for a Production Device are that the Production Device is capable of producing Output from the energy source and in the Energy Carrier(s) for which it is registered, in addition to any requirements as are defined in sections 5.1.3, 5.2.3, 5.3.3, 5.4.3.

4.4.1.3 Application information

The following information shall be provided to the Issuing Body, which shall record it in its Registration Database, in addition to any requirements as are defined in sections 5.1.2, 5.2.2, 5.3.2, 5.4.2 :

- a) the applicant's name and address and additional contact details;
- b) the identity of the Production Device, including its name or identity where one is commonly used to identify that it;
- c) the Account into which GO in respect of that Production Device are to be Issued, perhaps as the result of a request to open such an account in the application for registration. This will be assigned by the Competent Body unless otherwise requested by the applicant;
- d) the location of that Production Device, being its:
 - 1) latitude and longitude; and/or
 - 2) country, city, and postal code;
- e) the Technology Type of the Production Device; see the list in Annex B;
- f) all Inputs that may be converted into Outputs by the Production Device by reference to the Source Types set out in Annex A;
- g) all Energy Carrier(s) that the Production Device may produce (irrespective of whether or not there is any intention to produce such Energy Carrier(s));
- h) the nominal capacity of that Production Device, in kW;

- i) the date when the Production Device became operational according to the provisions of the Domain GO Scheme;
- j) the identity of the Authorised Measurement Body responsible for collecting and determining the measured values of the Outputs of that Production Device and providing such measured values to the Issuing Body;
- k) Information on public support, where relevant :
 - 1) whether the installation has benefited from investment Support;
 - 2) whether the unit of Output of the Production Device might be eligible to benefit and/or has benefited in any other way from a national Support scheme; and
 - 3) the type of Support scheme.
- l) where the Production Device is accredited to a Label Scheme, the identity of that Label Scheme.

4.4.1.4 Meters

Import and Export Meters shall conform to the relevant national legislation, grid, and measurement codes (as appropriate). This includes, without limitation:

- their minimum level of accuracy; and
- their certification (including the frequency of such certification).

Details of the following, including where relevant diagrams, shall also be provided to the Competent Body, but need not be recorded in its Registration Database:

- a) Import and Export Meter(s) for that Production Device;
- b) Production Auxiliaries (where relevant);
- c) Import Meter(s) for all energy sources that may be converted into Energy by that Production Device (where relevant); and
- d) any such details as are identified in sections 5.1.2, 5.2.2, 5.3.2, 5.4.2.

4.4.2 Application procedure for Account Holders

A person or organisation may apply with the Issuing Body for an Account. The applicant shall provide the following information to the Issuing Body:

- a) the type of organisation, including proof of status according to national scheme (such as supply licence);
- b) the applicant's name and address and additional contact details; and
- c) any such additional information as is required under the relevant Domain GO Scheme.

In addition to this information, Competent Bodies may request additional supporting documents as part of their due diligence procedures. This could include the following information:

- a) the identity of the applicant's shareholders and ultimate owner of the company;
- b) the identity of the top management of the company;

- c) an extract from the National Commercial registry where the company is domiciled and its VAT registry number; and
- d) information on the financial situation of the company (such as the last audited financial statement); and
- e) when applicable, a copy of the tax debt certificate provided by tax administrations.

The Issuing Body shall verify the information so provided and shall notify the applicant of the acceptance or rejection (as appropriate) in writing.

4.4.3 Obligations of Registrants

The Registrant of a Production Device is placed under an obligation:

- a) to provide correct information to, and to notify the Issuing Body of planned changes with regard to the details of the Production Device taking place in advance and to inform the Issuing Body immediately when unplanned changes take place, but no later than within a month;
- b) where requested to do so, to permit the Issuing Body (or the Production Registrar), or their respective Agents to inspect that Production Device including, if so required, without prior notice; and
- c) to provide the Issuing Body (or the Production Auditor) and/or their respective Agents with access to the Production Device itself and to such records concerning GOs as the Competent Body (or Production Auditor) may request in relation to that Production Device, its Outputs and Inputs, including, if so required, without prior notice.

4.4.4 Revision of Registration Databases

When the Issuing Body receives a notification of changes pursuant to 4.4.3 Obligations of Registrants, or becomes aware of changes not notified by the Registrant (e.g. pursuant to an inspection or otherwise) it shall amend its Registration Database:

- a) to include such changes to information recorded by that Issuing Body pursuant to 4.4.1.3 Application information
- b) where relevant, to reflect that following such changes the Production Device is no longer eligible to receive GOs under the relevant GO Scheme;
- c) (in relation to changes notified in advance) with effect from the date on which such planned changes are due to come into effect; or
- d) (in relation to other changes) as soon as reasonably practicable.

Further, the Issuing Body shall amend its Registration Database to show that the Production Device no longer qualifies for GOs:

- a) where the period of time during which that Production Device has been recorded in that Registration Database exceeds five years (or such shorter period as is defined in the relevant Domain GO Scheme), unless the Registrant re-applies for registration of the Production Device in accordance with 4.4.1 Application procedure for Production Devices, or the Issuing Body received a report from a Production Auditor, of less than five years old, comprising the information as mentioned in section 4.11.3.2; or
- b) upon request from a Registrant notified to the Issuing Body in writing.

Where the capacity of an existing Production Device increases for any reason, including refurbishment or enhancement of the Production Device, then the Issuing Body may allow such additional capacity to be registered in its Registration Database for that Domain as a separate element of that Production Device with the capacity and the date on which the Production Device became operational as specified in 4.4.1.

4.5 Issuing and content of a GO

4.5.1 Format of the GO

Each GO shall have a value of 1 MWh.

4.5.1.1 Obligatory information on a GO

A GO shall contain at least the following Attributes:

- a) the Energy Carrier for which the GO is issued, being Electricity, Heating, Cooling, Hydrocarbon Gas, or Hydrogen;
- b) the unique number assigned to the GO by the Issuing Body that Issued it, see normative Annex C;
- c) the nominal capacity of the Production Device in kW;
- d) the date when the Production Device first became operational;
- e) the first day on which the Output to which the GO relates was produced;
- f) the last day on which the Output to which the GO relates was produced; (this day is at the latest one month after the first day on which the Output to which the GO relates, was produced)
- g) the Source Type (see normative Annex A); a GO may only refer to a single Source Type category which is allocated to it in accordance with 4.5.5 and 4.5.6 respectively;
- h) the Technology Type (see normative Annex B);
- i) the identity of the Originating Production Device, being the unique number which has been assigned to that Production Device by the relevant Competent Body;
- j) the country in which the relevant Production Device is situated;
- k) the location of that Production Device, being its latitude and longitude; and/or country, city, and postal code (please see Normative Annex D for more information);
- l) the identity > (and country or region) < of the Originating Issuing Body;
- m) the date when the electronic Issuance of the GO took place;
- n) an indication, as appropriate, as to whether
 - 1) the Originating Production Device has received Public Support relating to investment in it;
 - 2) the unit of energy to which the GO relates has benefited from Public Support;
 - 3) both the Originating Production Device and the unit of energy have benefited from Public Support; or
 - 4) neither the Originating Production Device, nor the unit of energy have benefited from Public Support;and the type of support scheme;
- o) the purpose of the GO, being Disclosure.
- p) such additional information as is required in sections 5.1.5, 5.2.5, 5.4.4.

4.5.1.2 Optional information on a GO

In addition, a Domain GO Scheme may provide that a GO contains:

- a) where applicable, the capacity of the relevant production element of the Production Device and the date when this production element became operational;
- b) subject to the agreement of the Registrant, the name of the Production Device;
- c) where the GO has been issued in respect of a Production Device or an Input which is accredited to a Label Scheme and the Issuing Body is supporting that Label Scheme, the identifier of the relevant Label; More than one label can be mentioned on the GO;
- d) a quantification of carbon footprint, of the Output covered by the GO, and a reference to the methodology used for this quantification
 - Annex E provides guidance regarding the quantification of carbon footprint for the purpose of this standard ;
- e) such Energy Carrier-specific information as is considered optional under sections 5.1.6, 5.2.6, 5.3.5, 5.4.5.

4.5.2 Simplified Information on GOs for Production Devices with a nominal capacity below 50 kW

For production devices with a Nominal Capacity of less than 50 kW, the following information may be simplified to the level set out below:

- a) The Capacity, as mentioned in 4.5.1.1c), may be simplified by rounding it to the nearest 10 kW, except for capacities from 0 to 5 kW, which may be rounded to 5 kW, and capacities from 45 to 49,9 kW which may be rounded to 49 kW.
- b) the date when the Production Device first became operational, mentioned in 4.5.1.1d), may be rounded to the first day of the year in which the Production Device became operational.
- c) The number that identifies the Production Device, mentioned in 4.5.1.1i), may be a number that represents a group of Production Devices with the same Attributes.

Issuing Bodies shall take measures to ensure the uniqueness of GOs with simplified information and the quality of the registered data in relation to the corresponding Production Devices and their Output. The Issuing Body shall maintain a list of all Production Devices that are included per group identifier as mentioned in c) above.

4.5.3 The Issuing process

An Issuing Body may Issue GOs in response to a request made under the relevant Domain GO Scheme. A Domain GO Scheme may provide that an application to register a Production Device constitutes a continuous request to Issue GOs during such time as that Production Device is registered in the Registration Database. Any request for the Issuance of GOs shall be submitted to the Issuing Body no later than three months after the end of the period to which the Output relates, and shall be accompanied with a Production Declaration, and where relevant, a Consumption Declaration.

An Issuing Body may Issue GOs only:

- a) for Production Devices that are:
 - 1) situated within its Domain; and which are

2) registered in its Registration Database as qualifying for the relevant Domain GO Scheme for the relevant production period;

b) in respect of Output:

1) produced after the Date of Registration of the relevant Production Device;

2) for which the relevant measurement data has been collected and determined by an Authorised Measurement Body and provided to the Issuing Body; and

3) of which the Attributes have not been and will not be Disclosed otherwise.

The Issuing Body shall Issue the related GOs within one month of receipt of the relevant measurement data and Consumption Declaration, or within one month of receipt of a request for Issuance, whichever is the later. Upon Issuance, a GO shall be placed in the Account nominated for such purposes by the Registrant of the Originating Production Device. The Issuing Body shall be obliged to inform the relevant Account Holder of such Issuance and of the details of that GO or otherwise make such information available to that Account Holder.

Where the relevant Production Device is situated on the border of the Domain, the Issuing Bodies of the relevant Domains shall assure in close coordination that each Issuing Body only Issues GOs for the relative amount of energy produced by the Production Device which can be clearly assigned to its Domain.

An Issuing Body may not Issue more than one GO in respect of the same MWh produced. It may store records of GOs with identical Attributes in ranges of more than one MWh.

Note 1 to entry. For example, where 347 MWh is produced with identical Attributes, the resulting GOs may be stored as one record with a range of 1 through 347, reflecting the range of unique identification numbers of each of these GOs.

A Competent Body may retain a quantity of Output that is less than 1 MWh until the accrued quantity of Output so retained from the corresponding Production Device reaches the 1 MWh threshold.

The period between measurements may not be more than twelve months.

Where the period between measurements of the Output of a Production Device is more than one month, then the number of GO Issued to a Production Device for each month may be determined on a pro-rata or profiled basis in accordance with the relevant Domain GO Scheme by reference to the period between measurements.

The details of any GO shall not be altered (save with respect to its Status and the Account in which it is held) and a GO may not be Withdrawn once it has been Issued, save as provided by section 4.8 and 4.9[cross-references to corrections and end of life].

4.5.4 Measurement and calculation methods

4.5.4.1 General metering principle

Energy flows to and from the Production Device should be measured over a period in order to establish the Nett Energy Production during that period. The responsibility of the accuracy, delivery and quality of measurement data is the responsibility of an Authorised Measurement Body established by the relevant Domain GO Scheme. Where relevant, input to the Production Device is measured. See 4.5.5.

The Registrant of a Production Device is responsible for the delivery, quality and accuracy of measured values and the Production Declaration with respect to the energy Output of that Production Device.

GOs shall solely be Issued in respect of Output of which the measured value has been collected and determined by an Authorised Measurement Body.

If allowed according to the Domain GO Scheme some measurements can be calculated from others, which may allow for a reduced number of meters.

4.5.4.2 Calculation of Nett Energy Production eligible for GOs

An Issuing Body may Issue GOs for Nett Energy Production that takes place in its Domain, on condition that it is ensured that the origin Attributes of this amount of energy are prevented from being Disclosed through other means than by cancellation of these GOs.

No GOs are issued for the share of Output produced with the energy consumed by Auxiliaries.

The part of the Output that is consumed by the Production Device, shall be considered as an Auxiliary.

For any other energy that is fed into the Production Device, the Domain GO Scheme may determine whether a flow of energy that goes into a Production Device is considered to be an Input or an Auxiliary.

A Domain GO Schemes may allow that Auxiliary energy consumption of other Energy Carriers than the Energy Carrier produced, would not have to be deducted from the measured Output for which GOs are to be issued, on condition that such total non-deducted Auxiliary consumption stays under a certain percentage. This percentage shall not to exceed 2%

The calculation of Nett Energy Production eligible for GOs shall be in complemented with the Energy Carrier specific provisions set out in sections 5.1.7, 5.2.9, 5.3.7, 5.4.8.

Where a GO is issued for energy that is not made available for trade, it cannot be transferred and may only be cancelled to provide evidence of the consumption of the corresponding physical energy for which the GO was issued. Such GO shall therefore immediately be cancelled upon its Issuance.

4.5.5 Declaration of Consumption and Calculation of Output

4.5.5.1 Consumption Declaration

4.5.5.1.1 Requirement of Consumption Declaration

A person submitting a GO Issuing Request in relation to:

- a) a Production Device for which one of the Inputs is Stored Energy;
- b) a Production Device for which there is more than one Input;
- c) Energy Carrier Conversion for which Conversion Issuance is requested;
- d) A quantity of Output from a Production Device for which the energy consumption of any Auxiliaries has not yet been deducted from the Gross Energy Production at the Export Meter;

shall submit, in respect of the same period as that to which the GO Issuing Request relates, a Consumption Declaration.

4.5.5.1.2 Content of a Consumption Declaration

A Consumption Declaration shall specify at least the following information.

- a) A Consumption Declaration a Production Device for which one of the Inputs is Stored Energy shall be specify therein the amount of Output consumed in Energy Storage for use by that Production Device in that period.
- b) A Consumption Declaration for a Production Device using more than one Input shall contain the necessary information for determining the Energy Input Factor for that period.
- c) A Consumption Declaration for Conversion Issuance shall contain the amount of Input, per Energy Carrier, during that period and the identity and relevant Attributes of the GOs Cancelled to Disclose the Attributes of that energy.
- d) A Consumption Declaration for Auxiliaries shall contain the information for determining the amount of energy consumed by Auxiliaries in that period.

4.5.5.1.3 Determining the Energy Input Factor

A person submitting a GO Issuing Request in relation to a Production Device for which there is more than one Input shall be obliged to submit (in respect of the same period as that to which the GO Issuing Request relates) a Consumption Declaration for each Input and to specify therein:

- a) the values of I_1, \dots, I_n , and where applicable, $M_1 C_1, \dots, M_n C_n$; and
- b) the Energy Input Factor L for that Input and that period, where L is the Energy Input Factor used to determine the proportion of the total Output produced during this period by the relevant Input and is calculated as follows:

$$L = \frac{I_1}{I_1 + \dots + I_n}$$

where (for the relevant Energy Input and period):

I_1 is the energy content of the relevant Energy Input for that Production Device during that period;

I_n is the energy content of each Input other than the relevant Input for that Production Device during that period;

In case the Input is a primary energy source in the form of a material input with energy content,

I_1 shall be determined as M_1 multiplied by C_1, \dots , and I_n shall be determined as M_n multiplied by C_n ; whereby:

- M_1 is the mass of the material that is fed into the Production Device as the relevant Energy Input for that Production Device during that period, in case the input is a mixture of gases, volume can be used;
- C_1 is the average calorific value of the relevant Energy Input for that Production Device during that period;
- M_n is the mass of each material that is fed into the Production Device as the Input other than the relevant Input for that Production Device during that period, in case the input is a mixture of gases, volume can be used;
- C_n is the average calorific value of each Input other than the relevant Input for that Production Device during that period.

In case the Input is an Energy Carrier for which Conversion Issuance is requested, I_1 shall be determined as the amount of cancelled GOs for the relevant Energy Input, and I_n shall be determined as the amount of cancelled GOs for each other Energy Input.

4.5.5.2 Calculation of Output

Subject to the requirements of the Domain GO Scheme, the amount of Output associated to each Input determined for the purposes of GOs associated to each Input shall be the amount of Nett Energy Production produced by that Production Device multiplied by the Energy Input Factor for that Input, which shall be equal to one (1) where the Production Device produces energy from one Input, or as calculated in 4.5.5.1.3 where the Production Device produces energy from more than one Input.

4.5.6 Energy Carrier Conversion and Conversion Issuance

4.5.6.1 Principles –

4.5.6.1.1 General

The principles set out in the previous and following sections equally apply for Conversion Issuance, and are explained in this section for clarification, for the specific case of Conversion Issuance.

In case of Energy Carrier Conversion, similar to direct production of Output from primary energy, the amount of Energy Input to and Output from the production Device shall be measured.

The Attributes of an amount of Input shall be determined by Cancellation by the Registrant of a corresponding amount of GOs,

The Registrant shall cancel for this purpose only GOs of which the Energy Carrier mentioned on these cancelled GOs is the same as the Energy Carrier of the relevant Input. Where applicable, any additional Attributes to identify the details related to the Energy Carrier for which such cancelled GOs had been Issued, in accordance with any such requirements of section 5, shall be the same as those of the relevant Input to the Production Device for the Energy Conversion.

An amount of GOs may be Issued for the Output Energy Carrier(s) which correspond to the amount of measured Output of the corresponding Energy Carrier(s), determined as in section 4.5.4.

4.5.6.1.2 Cancelling GOs for energy carrier conversion

Where GOs are cancelled for Energy Carrier conversion, the Issuing Body shall verify that the amount of GOs cancelled corresponds to the quantity of Input fed into the Production Device during the period to which the Consumption Declaration (as in section 4.5.5.1) relates.

The Issuing Body shall record which GOs are cancelled for Energy Carrier Conversion and shall ensure that mechanisms are in place to identify to which Consumption Declaration each such Cancellation for Energy Carrier Conversion relates.

4.5.6.2 Energy Carrier Conversion Rules

4.5.6.2.1 Conversion Issuance

The amount of GOs to be Issued following Conversion Issuance shall be based on cancelled GOs per specific Source Type recorded on them, in correspondence to the Input Energy Carrier, and equal the

measured Nett Energy Production multiplied by the Energy Input Factor for each of the Inputs. The same principle as in section 4.5.5.2 is maintained.

4.5.6.2.2 Data to be mentioned on GO after Conversion Issuance

Those Attributes recorded on the GO after Energy Carrier Conversion are those which relate to the Production Device of the Energy Carrier Conversion, except for the following Attributes:

1. Attributes corresponding to the Source Type (as in 4.5.1.1 g) are inherited from the cancelled GOs related to the consumption of each Input Energy Carrier. The amount of GOs to be Issued with a specific Source Type is determined as its respective Energy Input Factor (as in 4.5.5.1.3) multiplied by the amount of GOs mentioning that specific Source Type;
2. Meta data for system management:
 - The Purpose (as in 4.5.1.1 o)) following Conversion Issuance shall remain the Purpose recorded on the cancelled GOs for the Input Energy Carrier;
 - Attributes related to the type and description of any support scheme (as in 4.5.1.1n)), shall be cumulated from the Input and the Production Device; and
 - A Label (as in 4.5.1.2 c) may be carried forward to the GOs issued for the Output Energy Carrier if the Label Scheme Operator supports this, following a quantitative allocation method agreed between the Label Scheme Operator and the respective Issuing Body.
3. Attributes related to any carbon footprint (as in 4.5.1.2 d)) are calculated, following the methodology in Annex E.

The Issuing Body shall take the necessary steps to ensure that where GOs are cancelled for the Input to a Production Device for Conversion, the details of the cancelled GOs are correctly transposed in the GOs issued for the Conversion.

The Issuing Body shall ensure qualitative verification takes place on the cancelled GOs for the Input to the Conversion Issuance.

4.5.7 Energy Storage

No GOs shall be issued for energy that flows out of an Energy Storage. The only exception is where the Energy Storage is located directly after the Production Device before the energy is injected into a network or any other transport mode connecting the Production Device with a Consumer, and no GOs are issued for the production of Output of the production Device.

Note: for the purpose of clarity: GOs may be cancelled to Disclose the Attributes of any energy losses that may occur during storage.

4.6 Ownership of GOs

The provisions of a Domain GO Scheme shall secure that a GO can only be owned by the Account Holder of the Account in which that GO resides, except for Account Holders designated by initial owners of the GO (at the moment of its issuance) to manage their GOs on their behalf.

4.7 Transferring of GOs

4.7.1 General

Solely duly authorised personnel of an Account Holder (or any person or organisation whom the Account Holder has duly authorised) may make a Transfer Request on behalf of that Account Holder with respect to a GO held on that Account Holder's Account. Where an Account Holder authorises a person or organisation other than its authorised personnel to make a Transfer Request on its behalf, it shall notify the relevant Issuing Body of such authorisation in writing.

A Transfer Request shall not relate to GOs that have been:

- a) Cancelled;
- b) Expired; or
- c) Withdrawn.

4.7.2 The Transfer process

Where an Issuing Body receives a Transfer Request it shall, after having confirmed that the Transfer Request is valid:

- a) remove the GOs specified in the Transfer Request from the relevant Account;
- b) where the Transferee's Account is in its own Registration Database:
 - 1) add the GOs referred to in section (a) to the Transferee's Account;
 - 2) confirm, to the Transferor, the identity of the transferred GOs; and
 - 3) confirm, to the Transferee, the identity of the Transferor and of the transferred GOs by reference to their unique identifying number; and
- c) where the Transferee's Account is on the Registration Database of another Issuing Body:
 - 1) notify that other Issuing Body of that Transfer Request;
 - 2) send the full details of the GOs referred to at section (a) to that other Issuing Body;
 - 3) record on its own Registration Database the export of such GOs; and
 - 4) on receipt of confirmation from that other Issuing Body that the transfer has been completed, confirm to the Transferor the identity of that other Issuing Body and of the GOs so transferred.

With regard to the Transfer process, an Issuing Body shall implement and maintain such level of process automation as prevents double-counting as a result of GOs being transferred.

4.7.3 Import/export from Registration Databases.

4.7.3.1 Receipt of request

Where, in accordance with 4.7.2. c) 1., an Issuing Body is informed by another Issuing Body of a Transfer Request, and pursuant thereto receives details of a GO which are consistent with the Criteria as set out in

4.7.2 for such a GO together with the account number for an Account on its own Registration Database, it shall:

- a) insert the full details of that GO in that Account Holder's Account;
- b) confirm to the Issuing Body that informed it of the Transfer Request that the transfer of that GO has been completed; and
- c) confirm, to the Transferee, that such GO has been transferred by reference to its unique identifying number.

4.7.3.2 Rejection of request

Where an Issuing Body is informed by another Issuing Body of a Transfer Request, and pursuant thereto:

- a) receives details of a GO which does not satisfy its Criteria as set out in 4.7.2 for such a GO; and/or
- b) receives an account number which does not correspond with an account number for an Account on its own Registration Database,

then each such Competent Body shall use reasonable endeavours to exchange information such that any missing details to satisfy its Criteria as set out in 4.7.2 and the correct account number can be identified, failing which:

- a) the full details of the GO shall be re-entered into the Transferor's Account on the relevant Registration Database, and that Registration Database shall be amended so that the GO is no longer recorded as having been exported; and
- b) all details of the GO shall be removed from the other Registration Database.

4.7.3.3 Restrictions of exports

An Issuing Body may not transfer (or attempt to transfer) a GO:

- a) to another Issuing Body other than between their respective Registration Databases for the purposes of their respective Domain GO Schemes; or
- b) to another Issuing Body for a country outside the European Union, unless:
 - i) there is direct export of energy of the corresponding Energy Carrier from the exporting Domain to the importing Domain; and
 - ii) an assessment report as in 4.11.2 proves compliance of the importing Domain GO Scheme with this EN16325 standard; and
 - iii) a system for verification of Disclosure Statements as in 4.11.5 is in place, of which, for the Energy Carriers for which section 5 foresees in the calculation of a Residual Mix, the Residual Mix is calculated in connection and in balance with the system for calculation of the Residual Mix of the exporting country; and
 - iv) for Energy Carriers for which section 5 does not foresee, in the calculation of a Residual Mix, that a mechanism is in place to ensure that the total amount of exported GOs between the relevant Domains per year does not exceed the total direct export of energy of that Energy Carrier in that year; or

c) to a body other than an Issuing Body.

4.7.3.4 Restriction of imports

An Issuing Body may not receive (or attempt to receive) transfers of GOs other than

a) into its Registration Database from the Registration Database of an Issuing Body: and either

b) from a Domain in the European Union;

or

c) from a Domain outside the European Union, for which:

i) there is direct import of energy of the corresponding Energy Carrier from the exporting Domain to the importing Domain;

ii) an assessment report as in 4.11.2 proves compliance of the exporting Domain GO Scheme with this EN16325 standard;

iii) a system for verification of Disclosure Statements as in 4.11.5 is in place, of which, for the Energy Carriers for which section 5 foresees in the calculation of a Residual Mix, the Residual Mix is calculated in connection and in balance with the system for calculation of the Residual Mix of the importing Domain; and

iv) for Energy Carriers for which section 5 does not foresee in the calculation of a Residual Mix, a mechanism is in place to ensure that the total amount of imported GOs between the relevant Domains per year does not exceed the total direct import of energy of that Energy Carrier in that year.

4.8 Correction of errors

4.8.1 Errors during issuing

Where an error is introduced (subsequent to its Issue) into, or with respect to, a GO held in an Account Holder's Account in an Issuing Body's Registration Database:

a) in the course of its Transfer into that Account; or

b) during such time as it is in such Account,

that Issuing Body shall correct the error in or with respect to that GO by Withdrawing or Altering this GO, provided that it has not been Transferred out of that Account. The Issuing Body shall notify the Relevant Account Holder of such Withdrawal or Alteration.

4.8.2 Errors during transfer<

Where the erroneous GO has been Transferred into another Account in its Registration Database, the Issuing Body may Withdraw or Alter the GO, so as to rectify an error which occurred prior to its Transfer into the Account in which it is held at such time, provided:

- a) the relevant Account Holder has agreed to such Alteration or Withdrawal;
- b) it is reasonably satisfied that any unjust enrichment of the Account Holder as a consequence of such error has, to the extent reasonably practicable, been nullified; and
- c) it is reasonably satisfied that the Alteration or Withdrawal itself does not give rise to undue enrichment of the Account Holder.

Each Issuing Body shall afford each other Issuing Body all such co-operation as may be required to identify and rectify errors in GOs in a timely manner.

4.9 End of the life of a GO

4.9.1 General

A GO can no longer be used, and the consumption of its Attributes can no longer be claimed, after:

- a) it is Cancelled in accordance with a valid Cancellation request made under 4.9.2.1;
- b) it is withdrawn in accordance with 4.9.3; or
- c) it ceases to be eligible for Cancellation in accordance with 4.9.4 and in the manner and time set out in the relevant Domain GO Scheme.

4.9.2 Cancellation

4.9.2.1 Cancellation procedure

4.9.2.1.1 General

Solely duly authorised personnel of an Account Holder are entitled to request the Cancellation of a GO held in that Account Holder's Account.

A Cancellation request shall not relate to GOs that have been:

- a) Cancelled;
- b) Expired; or
- c) Withdrawn.

4.9.2.1.2 Requesting a cancellation

Where an Account Holder requests that an Issuing Body Cancels one or more GOs then such a request shall contain the following information:

- a) the Account Holder requesting Cancellation of the GOs;
- b) the identity of the relevant Production Device(s) or the Technology Type and Source Type;
- c) the relevant number of GOs associated with each Production Device or category listed in (b) to be Cancelled;
- d) the relevant production period(s);

- e) the beneficiaries of the Cancellation, being:
 - 1) the type of consumer, being either
 - i) “energy supplier” (on behalf of its retailer(s) and/or end-consumer(s)), or
 - ii) “end-consumer” directly or
 - iii) “Production Device operator”, in case of Energy Carrier Conversion;
 - 2) the identity of:
 - i) the energy supplier; or
 - ii) the end consumer consuming the corresponding amount of energy; or
 - iii) the Production Device in which the energy is being converted into another Energy Carrier, in case of Conversion Issuance;according to type of consumer as identified in (1);
 - 3) location and country of energy supplier or, end-consumer, or Production Device according to type of consumer as identified in (1).
- f) the period during which the associated energy has been consumed, or, in case of supply in bulk, the date of delivery;

4.9.2.1.3 Cancelling a GO

The provisions of each Domain GO Scheme shall be such that where a GO has been Issued for the Output of a Production Device, then the Attributes of such Output may only be Disclosed through Cancellation of the GO or through its Expiry and subsequent inclusion in a Residual Mix.

Where an Issuing Body receives from an Account Holder a request made in accordance with this clause and the relevant Domain GO Scheme to Cancel a GO held in that Account Holder’s Account on that Issuing Body’s Registration Database, the Issuing Body shall:

- a) remove the details of that GO from that Account;
- b) change the status of that GO from eligible for Cancellation to Cancelled;
- c) notify the Account Holder of the Cancellation of the GO.;
- d) provide details of the Cancelled GO to the Disclosure Body and its auditors where requested to do so.

4.9.2.1.4 Limitations for Cancellation

An Issuing Body may Cancel a GO solely:

- a) for use in its own Domain; or
- b) for use in any country or destination Domain, provided each of the following conditions is met:

1) such country or Domain is (part of) an EU Member State or a country outside the European Union for which

- i) there is direct export of energy of the corresponding Energy Carrier from the cancelling Domain to the destination Domain; and
- ii) an assessment report as in 4.11.2 proves compliance of the destination Domain GO Scheme with this EN16325 standard; and
- iii) a system for verification of Disclosure Statements as in 4.11.5 is in place in the GO Scheme of the destination Domain, of which, for the Energy Carriers for which section 5 foresees in the calculation of a Residual Mix, the Residual Mix is calculated in connection and in balance with the system for calculation of the Residual Mix of the Domain where the cancellation takes place; and
- iv) for Energy Carriers for which section 5 does not foresee in the calculation of a Residual Mix, a mechanism is in place to ensure that the total amount of cancelled GOs for the destination Domains per year does not exceed the total direct export of energy of that Energy Carrier to that Domain in that year; and

2) automated Transfer of GOs is temporarily impossible due to technical difficulties; and

3) the Issuing Bodies from both Domains and/or countries have agreed to such Cancellation; and

4) the Cancelling Issuing Body provides information on the Cancelled GOs to the Issuing Body of the country/Domain for whom the GOs are Cancelled; and

5) the inclusion on any related Cancellation Statement of the identity of the country/Domain for whom the GOs are Cancelled.

A GO may be Cancelled until eighteen (18) months after the last day on which the Output to which the GO relates was produced, or until such earlier deadline as the relevant Domain GO Scheme provides.

A GO shall only be cancelled for the purpose of Disclosure, and to demonstrate the origin of energy consumed:

(a) during a period starting within 12 months after the last day on which the Output to which the GO relates was produced; and

(b) [before the date of cancellation of the GO,] or in the consumption period during which the Cancellation takes place.

Maximum length of a consumption period being one calendar year.

Sections 5.1.8 and 5.4.6 specify further limitations with regard to Cancellation of GOs of each individual Energy Carrier.

4.9.2.2 Requesting and Producing a Cancellation Statement

The provisions of a Domain GO Scheme may provide for Cancellation Statements to be produced by an Issuing Body.

A request may be made by an Account Holder to an Issuing Body for the production of a Cancellation Statement in relation to GOs that have been Cancelled from the Account of that Account Holder in accordance with 4.9.2.1.

Where an Issuing Body produces a Cancellation Statement pursuant to a request made in accordance with 4.9.2.1 then it shall use the Cancellation Statement format identified in the relevant Domain GO Scheme of that Competent Body.

The provisions of each Domain GO Scheme shall be such that in addition to the items listed in section 4.9.2.1 each Cancellation Statement shall display:

- a) a statement that it relates to the Cancellation of GOs
- b) the account number, name and address of the Account Holder that made the request;
- c) a statement that the Attributes of the associated energy have been consumed and that the Cancellation Statement and these information on GOs included in it may not be transferred to any party other than the beneficiary identified in this Cancellation Statement;
- d) the identity of each GO that is associated with this Cancellation Statement; and
- e) the date of producing the Cancellation Statement
- f) a unique identification number of the Cancellation Statement.

When producing a Cancellation Statement, an Issuing Body shall record in its Registration Database the GOs that are included in that Cancellation Statement, ensuring that each GO is included in no more than one Cancellation Statement.

4.9.3 Withdrawal

An Issuing Body may Withdraw a GO held in an Account on its Registration Database for the purpose of correcting errors in accordance with 4.8. After such Withdrawal, the Issuing Body may issue a corrected GO where appropriate.

4.9.4 Expiry

A GO ceases to be eligible for Transfer twelve months after the end of the period during which the Output to which it relates was produced. A GO ceases to be eligible for Cancellation eighteen months (or such shorter period as the relevant Domain GO Scheme provides) after the end of the period during which the Output to which it relates was produced.

The Issuing Body shall record the status of a GO which has ceased to be eligible for Cancellation as Expired in the Registration Database in which it is held at such time.

4.10 Disclosure Statements

A Domain GO Scheme shall contain provisions for Disclosure Statements, at least for energy from RES, with regard to the timing of their publication and their visual presentation. Disclosure Statements for the share or quantity of energy from RES shall be calculated and prepared based on, as appropriate:

- a) GOs Cancelled by the relevant Account Holder;
- b) where applicable, the Residual Mix;

- c) where the provisions of a Domain GO Scheme exclude the Issuance of GOs for Production Devices and/or units of energy in receipt of Public Support: statistical information on the origin of energy so supported or another mechanism specified in the Domain GO Scheme which avoids the same Attributes from being Disclosed more than once; and/or
- d) where physical import of energy occurs from an undertaking situated outside the Union, aggregate figures or unambiguous proof provided by the undertaking in question on the origin of the corresponding energy; and/or
- e) such other sources of data as section 5.1.9 of this Standard provides, while ensuring that the Attributes of the same Energy are only Disclosed once to a final customer.

As part of the Residual Mix calculation methodology for a given Energy Carrier, Competent Bodies should ensure that multiple claims of the Attributes of energy are prevented. This implies that the consumption of energy with the same Attributes only be claimed with either GOs, or possible other energy tracking systems in use in their country or the Residual Mix.

4.11 Monitoring and Auditing

4.11.1 Monitoring

Competent Bodies shall implement effective measures to monitor the activity in the Domain GO Scheme in order to ensure compliance of Account Holders with this standard that enable detect and prevention of fraud by the relevant authorities. These measures may be adapted according to national regulation but also coordinated as much as possible with other Competent Bodies.

The monitoring measures shall ensure a systematic review of the operations within the Domain and the detection of unusual or suspicious operations.

Competent Bodies may request information available in other Domains from their respective Competent Bodies, which the counterpart Competent Body may at its sole discretion provide. The information that may be shared between Competent Bodies for this purpose includes:

- a) any information related to the lifecycle of a specific GO;
- b) information on the activity of an Account Holder where the company has also an Account in the Domain of the requesting Competent Body; and
- c) due diligence information related to a prospective Account Holder when the company has an Account in the Domain of other Competent Bodies.

Competent Bodies shall ensure that electronic records are kept on each GO issued, transferred (including imports/exports) or Cancelled within their Domain. These records shall allow to determine:

- a) The Account or Accounts in which a GO has been held and the period during which it was held in that Account or those Accounts;
- b) Where applicable, all the details on import/export operations, including the countries from which the GOs were imported or to which they were exported and the import/export counterparty.

These records shall be kept as defined in section 4.11.6.

4.11.2 Assessment of the Domain GO Scheme

The Competent Bodies involved in the implementation of the Domain GO Scheme shall, together with such authority as the Domain GO Scheme provides supervises them, define and publish:

- a) the goals to be achieved by each Competent Body; and
- b) the required processes to be implemented to achieve those goals.

For the purpose of securing accuracy, reliability and veracity of the GO system, the Competent Body of any importing Domain may request an assessment report, by an independent auditor with the relevant competence and credentials including in-depth experience of energy markets and in particular energy source certification and GO system operation, of maximum three years old. A first audit report may be requested as of the end of the first year of operation.

This assessment report shall include a reasoned opinion :

- a) whether the provisions of this standard EN16325 are met;
- b) whether the process controls as described can be sufficient to achieve their respective goals;
- c) whether such process controls:
 - 1) have been properly defined; and
 - 2) are actually implemented; and
 - 3) have functioned as intended during the period that is being audited.

The assessment report shall comprise:

- a) the period to which the assessment relates;
- b) an overall opinion;
- c) for each process control:
 - 1) the activities carried out to form its opinion;
 - 2) the findings with regard to that process control.
- d) the date;
- e) the signature of the formal representative of the organisation that conducted the assessment and the assessment panel.

The Issuing Body and its supervisory authority may publish on its website a statement whether the audit has been carried out, including the date and its outcome (whether the audit was satisfactory or not).

4.11.3 Inspection of Production Devices

4.11.3.1 Type of Inspections

An Issuing Body shall at its own discretion conduct or commission:

- a) inspections of Production Devices registered on its Registration Database and the associated Import Meter(s) and Export Meter(s) with a view to satisfying itself that the provisions in this section 4.11.3 are met.
- b) ad hoc inspections of records associated with Attributes on the GOs that are registered on its Registration Database, or for which it received an issuing request.

4.11.3.2 Subject of Production Device Inspection

An Issuing Body shall make sure that the quality of the following information is guaranteed and accurate, with regards to the Production Devices registered on its Registration Database and to the associated Export and Import Meters with a view to ensure that:

- a) the information recorded in relation thereto on the Registration Database is accurate;
- b) the Registrant and, where applicable, the owner and/or operator of the Production Device, is complying with all relevant obligations under this standard and the relevant Domain GO Scheme;
- c) such Production Device meets the applicable qualification criteria in relation to which it is registered, in accordance with the sections 5.1.2, 5.1.3, 5.2.2, 5.2.3, 5.3.3, 5.3.2, 5.4.2, 5.4.3;
- d) the energy source of the Input is in accordance with the reported Source Type in section 4.5.5.1 and 4.5.4;
- e) the Export Meter(s) and where applicable the Import meter(s) are well positioned to correctly calculate the Output in accordance with section 4.5.5.2, and to determine the amount of GOs to be issued for each Source type;
- f) the accuracy of the measurement devices involved in the determination of Output, is acceptable in accordance with the existing regulatory framework and applicable standards; and
- g) the formula for calculating the number of GOs to be issued, correctly reflects the amount of Output that qualifies for issuing GOs with the corresponding Attributes mentioned on these GOs, or whether amendments to this formula are needed.

It shall do so through verification mechanisms that involve confirmation by a party independent of the party/ies who benefit(s) from the amount of GOs issued.

In addition to the requirements of this section 4.11.3, auditing of Production Devices shall be done in accordance with the rules defined per energy carrier in sections 5.2.8, 5.3.6, 5.4.7.

4.11.3.3 Access for Production Auditor and Production Registrar

Where the Issuing Body or an Agent commissions an inspection, the Issuing Body shall ensure that the Production Auditor and/or Production Registrar (as appropriate) has access to:

- a) the data regarding the Production Device to be inspected, as registered in its Registration Database;
- b) the formula for calculation of the amount of Output that qualifies for the issuance of GOs for the relevant Production Device; and
- c) specifications of the Measurement Devices as recorded by the Production Registrar.

4.11.4 Verification of Consumption Declarations and measurement data

An Issuing Body shall ensure that the information on the basis of which GOs are issued, is accurate. It may therefore, at its own discretion, establish the independent examination by a Production Auditor of relevant records and, where appropriate, plant and equipment to confirm the accuracy of Production Declarations and (where appropriate) Consumption Declarations in relation to that Production Device.

In addition to any requirements set by the Domain GO Scheme, where the Consumption Declaration concerns Inputs from biological origin or from a mixture of biological and fossil origin, the Registrant

shall provide to the Issuing Body a report from a Production Auditor at least once every two years, comprising:

- a) the period with regard to which it has performed the inspection;
- b) a description of the activities it carried out to form its opinion;
- c) a statement confirming or refuting:
 - 1) the veracity of Consumption Declarations provided in accordance with section 4.5.5.1.3 with regard to the period mentioned under a) above; and
 - 2) that the composition and respective amounts of Inputs as identified by mass and calorific value for each Input in those Consumption Declarations could realistically yield the amount of Output that is reflected by GOs that have been issued for the period mentioned under a) above, including their respective Attributes.
- d) the date;
- e) its signature.

4.11.5 Verification of Disclosure Statements

The provisions of a Domain GO Scheme shall be such that a Disclosure Authority be appointed to:

- a) annually calculate the Residual Mix, where relevant, while ensuring at least that no energy from RES is Disclosed as such more than once;
- b) supervise:
 - 1) the accuracy and veracity of Disclosure Statements provided to customers with the bill or with other billing material;
 - 2) that the total quantity of Disclosed volumes, according to tracking mechanisms supported by the Domain GO Scheme, matches the total supplied volumes by energy companies;
 - 3) where such tracking mechanisms include Residual Mix, the usage of those figures in Disclosure by suppliers;
 - 4) where such tracking mechanisms are not limited to GOs and Residual Mix, calculation of and the use of resulting figures for Disclosure, which prevents Attributes represented by GOs from being double counted implicitly;
 - 5) that GOs are Cancelled in such amounts and with such Attributes relating to energy from RES as are adequate to corroborate the share or quantity of energy with specific Attributes relating to energy from RES in an energy supplier's energy mix and in the energy supplied to consumers under contracts marketed with reference to the consumption of energy with specific Attributes;
- c) ensure appropriate action with regard to Disclosure Statements that do not conform to the requirements of the relevant Domain GO Scheme.

4.11.6 Operational practice

The provisions of each Domain GO Scheme shall be such that:

- a) each Account Holder shall be required to keep secret any passwords and other information used to establish that communications purportedly made on its behalf in connection with the Domain GO Scheme are duly authorised (<authorisation data>);
- b) each Competent Body shall require Account Holders to agree that any communication which is sent using its currently applicable authorisation policy data is valid and is committing to the Account Holder;
- c) the Account Holder(s) and the relevant Competent Body shall be obliged to retain all records to which they have had access relating to that GO for at least 5 years after its Cancellation (or such longer period as may be required by applicable national legislation); and
- d) each Competent Body shall ensure that its manual and automated information systems for the issue, holding and Transfer of GOs record information of all transactions in such way that it can reliably support audits with respect to GO held on its Registration Database or transferred to or from such Registration Database.

5 Rules specific to individual energy carriers

This section adds to the abovementioned requirements rules relating to each individual energy carrier.

In case of production of multiple energy carriers for which Issuance of GOs is being requested, the additional requirements for on each of these energy carriers shall apply.

5.1 Electricity

5.1.1 Applicability

The provisions of this chapter apply to GO Schemes for Electricity in addition to those provisions specified in sections 1,2,3 and 4. The provisions of this Chapter 5.1 shall apply to:

- a) Production Devices that produce the Energy Carrier Electricity; and
- b) GOs that convey the Attributes of Electricity;
- c) Registration Functions relating to both of the above.

5.1.2 Additional application information for the registration of a Production Device for Electricity

In addition to the requirements set out in 4.4.1.4, the following information shall be provided to the Issuing Body, but needs not be recorded in its Registration Database:

- a) a simplified single line diagram for electrical flows, displaying:
 - 1) flows of other Energy Carriers;
 - 2) the location of any transformer substations;
 - 3) grid injection points;
 - 4) Auxiliaries;
 - 5) Import and Export Meters;
 - 6) Storage facilities;
 - 7) consumption at the site of the Production Device.

5.1.3 Production Devices for Electricity

With regard to Production Devices for Electricity:

- a) for the purpose of section 4.4.1.3h), 'Capacity' shall mean the nominal electrical capacity of the Production Device, in kW.

5.1.4 Additional provisions for High-Efficiency Cogeneration Electricity

A Domain GO Scheme shall ensure that no more than one GO is Issued for each MWh of Electricity that is produced, containing all relevant Attributes.

5.1.4.1 Calculation of Output for High-Efficiency Cogeneration Electricity

The amount of Output that may be considered High-Efficiency Cogeneration Electricity produced by a Production Device shall be determined by the relevant Issuing Body or its Agent and calculated in

accordance with Annexes I and II of the Energy Efficiency Directive taking into account only energy produced from Inputs at the same site.

The Registrant shall provide to the Issuing Body a Production Declaration, containing information with regards to the amount and use of heat produced in the Production Device .

5.1.5 Obligatory additional information on a GO for Electricity

In addition to those identified in section 4.5.1.1, a GO for Electricity shall contain the following Attributes:

- a) where the Electrical Energy has been found to be High-Efficiency Cogeneration Electricity:
 - 1) use of heat, being the value which represents the predominant use of the relevant heat (see normative Annex D for more information);
 - 2) lower calorific value in megajoules per kilogramme of fuel or megajoule per cubic metre of gaseous fuel or megajoule per litre of liquid fuels. For conventional purposes, dry basis of the nett calorific value should be used for the calculation;
 - 3) Primary Energy Savings, including:
 - i. the Primary Energy Saved expressed as a percentage according to Annex II of the Energy Efficiency Directive; and
 - ii. the actual amount of Primary Energy Saved expressed in megajoules per MWh; and
 - iii. the overall Primary Energy Savings expressed as a percentage based on the total energy Input and Output flows of a Cogeneration unit (whereas the Annex II of the Energy Efficiency Directive Primary Energy Savings calculations identified in 5.1.5a)3)i are based on the Cogeneration Inputs and Outputs only).
 - 4) thermal capacity of the Production Device in MWh;
 - 5) Useful Heat production from Cogeneration correlating to 1 MWh of High-Efficiency Cogeneration Electricity production;
 - 6) nominal electric efficiency;
 - 7) nominal thermal efficiency;
 - 8) an indication that the GO was issued for High Efficiency Cogeneration Electricity, in correspondence with the criterion mentioned in Annex I and II of the Energy Efficiency Directive.

5.1.6 Additional optional information on a GO for Electricity

In addition to those identified in 4.5.1.2, a Domain GO Scheme may provide that a GO for Electricity contains the following Attributes:

- a) where the Source Type relates to nuclear energy, the radioactive waste produced per MWh of Electrical Energy to which that GO relates.

Note: At the time of publication of this document there is no agreement in Europe on what constitutes a verifiable, reliable, and accepted method for calculation of the above.

5.1.7 Calculation of Nett Energy Production eligible for GO issuing

In addition to the requirements in 4.5.4.2, the Output of an Electricity Production Device is determined based on the nett Electricity production, where the energy consumption of any Auxiliaries have been deducted from the gross electricity production.

In addition to the requirements in section 4.5.4.2 **Error! Reference source not found.**, unless they are immediately cancelled upon Issuance, GOs may only be issued for the Output that is measured in line with regulated settlement procedures and that is injected into:

1. a Distribution or Transmission system (where Distribution and Transmission are defined as in (EU) 2019/944 for electricity and (EU) 2009/73 for gas); or
2. a Closed Distribution System or another type of grid, if it meets all of the following criteria:
 - Electricity production on this grid, according to national legislation, fulfils the criteria for GO issuance, and
 - the Electricity for which GOs are being issued, is released onto a market for trade, and
 - the Domain GO Scheme provides that the quantity of both production and consumption in that grid are taken into account in the residual mix calculations, and that consumption on that grid is subject to a legal Disclosure requirement backed with either:
 - i. cancelling GOs for consumption of electricity with specific Attributes, or
 - ii. Residual mix.

5.1.8 Limitations for Cancellation of GOs for Electricity

To Disclose the Attributes of Electricity consumed in any given calendar year, a GO shall be Cancelled before 1 April of the following calendar year.

5.1.9 Additional data sources for Disclosure Statements

For the purpose of calculation and preparation of Disclosure Statements in accordance with section 4.8, the following sources of data may be used for Electricity:

- a) Residual Mix as calculated by the Disclosure Authority – see 4.11.5 and 5.1.10;
- b) Contracts regarding supply of Electricity from non-renewable sources.

Where a GO system is in place for a specific energy source, there is an obligation to cancel Guarantees of Origin (or to use other tracking mechanisms supported by the legislation) when claiming the related Attributes of that energy source for Disclosure.

5.1.10 Residual mix calculation

In calculating the Residual Mix of their country for electricity, Competent Bodies shall deduct the volume of issued GOs for electricity and add the volume of GOs for electricity which are expired for cancellation, from the domestic electricity generation mix of a calendar year. When after this calculation, there is a

deficit of Attributes in the domestic Residual Mix in order to cover total domestic electricity consumption, this deficit shall be complemented with Attributes from the European Attributes Mix.

In the geographic area where GO trade is facilitated, as determined under 4.7.3, Competent Bodies should cooperate in order to adjust their Residual Mixes in reflection of cross border transfers of physical electricity, GOs and other legal energy tracking systems in use in their country. Hereto they shall cooperate to determine the European Attribute Mix, which consists of the surplus of Attributes from the domestic residual mixes of all participating countries which are not domestically used for claims on the origin of consumed energy.

5.2 Hydrocarbon Gas

5.2.1 Applicability

The provisions of this chapter apply to GO Schemes for Hydrocarbon Gas in addition to those provisions specified in sections 1,2,3 and 4. The provisions of this Chapter 5.2 shall apply to:

- a) Production Devices that produce the energy carrier Hydrocarbon Gas; and
- b) GOs that convey the Attributes of Hydrocarbon Gas;
- c) Registration Functions relating to both of the above.

5.2.2 Additional application information for the registration of a Production Device

In addition to the requirements set out in 4.4.1.4, the following information shall be provided to the Issuing Body but needs not be recorded in its Registration Database::

- a. Plant description and layout of the plant, including the Technology Type as mentioned in Annex B and the location within the production site, of the Production Device, Auxiliaries, compression substations, location of onsite consumption of the gas, and network injection point and/or the point where the gas becomes available for trade, on which the positions of the relevant Import and Export Meters are indicated;
- b. In addition to the information on the capacity of the gas Production Device, where applicable, information on the nominal capacity of the:
 1. raw gas production plant and of the gas upgrading plant: (in kWh/h under Normal pressure and temperature);
 2. liquefaction plant (in tonnes per hour);
 3. fermenter (in m³);
 4. methanation plant (in kWh/h under Normal pressure and temperature);
 5. electrolyser capacity (in kWh/h under Normal pressure and temperature);
 6. steam reformer capacity (kWh/h).

- c. Date on which the upgrading unit became operational in case the Output of the Production Device is Network-compatible Gas.

For the purpose of section 4.4.1.3h), 'Capacity' shall mean the nominal capacity of the Hydrocarbon Gas Production Device, expressed in kWh/h under Normal pressure and temperature.

5.2.3 Production Devices for Hydrocarbon Gas

The qualification criteria for a Production Device are that the Production Device is capable of producing Hydrocarbon Gas from the energy source for which it is registered.

For the purpose of section 4.4.1.3 i), the 'date operational' shall relate to the date in which the device that produces the final Output became operational.

Note: in case of production of biogas that is being upgraded to gas network quality, the capacity relates to the capacity of the upgrading plant.

For the purpose of section 4.4.1.3h), 'Capacity' shall relate to the capacity of the device that produces the final Output.

Note: in case of production of biogas that is being upgraded to gas network quality, the capacity relates to the capacity of the upgrading plant.

5.2.4 Additional criteria for issuing GOs

In addition to 4.5.3 an Issuing Body shall only Issue GOs for a Production Device if the following information are provided within the GO issuing request:

- a. The amount of electricity, fuel and/or heat consumption of the generation plant for 1 MWh of gas;
- b. Whether or not the Production Device is connected to a gas Distribution System or Transmission System (A system grid technical or commercial access contract with the gas network operator shall serve as proof); and
- c. Any necessary information to prove compliance with the criteria mentioned in 5.2.3.

If the optional Attributes on the GO in 5.2.6 a) are facilitated by the Domain GO Scheme, the Registrant shall provide the Issuing Body with the respective confirmation documents. The Domain GO Scheme shall indicate requisites of such confirmation documents and the data provided therein, which may include evidence of audit and certification of the Production Device by respective verification schemes according to Article 30 of the RES Directive.

5.2.5 Obligatory additional information on a GO for Hydrocarbon Gas

In addition to the information in 4.5.1, a GO for Hydrocarbon Gas shall contain the following Attributes:

- a) the means of supply, being either: "injected in pipeline" or "transport by vehicle";
- b) the type of gas, being either "Network compatible Gas" or "Other Gas";

Any gas that is injected into the Distribution or Transmission System for natural gas, shall be considered under the ‘Means of supply’ category ‘Injected in pipeline’ and the Type of Gas category of Network Compatible Gas.

5.2.6 Additional optional information on a GO for Hydrocarbon Gas

A GO for Hydrocarbon Gas may also contain the following information:

- a) Information related to gas compliance with the sustainability criteria outlined in Article 29 of the RES Directive (where applicable), if it is made available in the confirmation documents provided by respective verification schemes according to Articles 30-31 of RES Directive:
 - a. Whether or not the produced gas complies with the applicable sustainability criteria referred to in the Renewable Energy Directive, and/or
 - b. a reference to the certification body which confirmed that this is the case, and /or
 - c. a reference to the relevant report produced by this certification body.
- b) If Output is produced from a mixture of Inputs, consisting of other than only the Input from the Source Type indicated in 4.5.1.1 g) : in addition to the Attribute recorded as the Source Type for which the corresponding GO was Issued, information on those Inputs, Source Type, and their share in total energy Input. This share shall be determined in accordance with the Energy Input Factor.
- c) In accordance with 4.5.1.2a). in case the Production Device consists of separate modules of which there is a plant which upgrades the gas quality. the date on which the plant(s) became operational that produced the raw gas and its/their capacity.

5.2.7 Additional criteria related to Conversion Issuance

5.2.7.1 Hydrocarbon Gas GOs cancelled for Conversion Issuance

Where Hydrocarbon Gas GOs are Cancelled for Conversion Issuance, in addition to 4.5.6.1.1 the Registrant shall cancel for Conversion Issuance only GOs which mention the same type of Gas as the type of Gas flowing into the Production Device for the corresponding Energy Carrier Conversion.

5.2.7.2 Hydrocarbon Gas GOs relating to hydrogen injected into the natural gas Distribution or Transmission System

Hydrocarbon Gas GOs may be issued for the Nett Energy Production of hydrogen for which no Hydrogen GOs have been issued and that is injected into the natural gas Distribution or Transmission System.

When Hydrogen was produced in another place than the site from where it is injected into the natural gas Distribution or Transmission System, Conversion Issuance for Hydrocarbon Gas GOs can take place if Hydrogen GOs are cancelled in accordance with 4.5.6. In addition to 4.5.6.2.2, the Attributes on the GO that relate to the Production Device, as mentioned in 4.5.1.1 c), d), e), f), h), i), j), k), n), p) in this specific case only, shall refer to the Attributes relating to the Production Device mentioned on the cancelled GOs for Hydrogen.

5.2.8 Inspections

5.2.8.1 Verification of an application for registration of a Production Device

For the purposes of 4.3.5.2, an inspection of a Production Device of Hydrocarbon Gas is mandatory before the first issuance of GOs for the Output produced by it.

As mentioned in 4.3.5.2 part of the verification's task is to document the possibility to obtain Hydrocarbon Gas from the energy source for which the Production Device is registered and within its technical limitations.

Note: Onsite inspections can be replaced by providing a valid permit(-s) or license issued by an public authority or an authority recognized by the Issuing Body, depending on the national regulation and/or legislation, if the Issuing Body can derive from it that the requirements of an inspection have been fulfilled.

5.2.8.2 Verification of Consumption and Production declarations for Renewable Hydrocarbon Gas

An inspection of the Consumption and Production Declarations as in 4.11.4 in relation to any issuing request for GOs for Renewable Hydrocarbon Gas, shall take place at least on an annual basis. The results from the inspection are to be disposed to the Issuing Body.

There are two options for performing such an inspection. In both cases the information must coincide with the information reported to the Issuing Body (or Production Registrar) responsible for the respective Production Device.

- a) Verification of Metering data by distribution or transmission system operators. The distribution or transmission system operators send the metering data (manually or through an automated interface) to the respective Issuing Body (or Production Registrar).
- b) Onsite inspection by Production Auditor. A Production Auditor provides the inspection results regarding production of Hydrocarbon Gas once the onsite production inspection of the Production Device has taken place.

5.2.8.3 Renewable Hydrocarbon Gas of Biological Origin: Inspection of substrate specific data

In addition to 4.11.4, where the Output of a Production Device is Renewable Hydrocarbon Gas of Biological Origin, the Issuing Body (or Production Registrar) shall request an inspection of the substrate specific data (related to the ones mentioned on the GOs issued for the corresponding Production Device as included in Annex A) of the Inputs used by the Production Device to obtain the reported Output.

The inspection shall be done on an annual basis by a Production Auditor. The inspection's results and findings shall be submitted to the Issuing Body (or Production Registrar).

The raw materials used for the production of Renewable Hydrocarbon Gas of Biological Origin shall be documented in the record of substances used in a comprehensible and complete manner to enable the inspection that the quantity of Biomass used for the generation was sufficient for the produced quantity of Renewable Hydrocarbon Gas of Biological Origin.

5.2.8.4 Guidelines for Inspections

The audits shall be reflected into a report of the Production Auditor with a comprehensive explanation of the findings and results.

5.2.9 Calculation of Nett Energy Production eligible for GO issuing

In addition to the requirements in 4.5.4.2, the Output of a Hydrocarbon Gas Production Device is determined based on a flow measurement that is multiplied with the calorific value of the produced gas.

For the purpose of calculation of Output as in 4.5.5, for determining the energy content of Hydrocarbon Gas, the upper calorific value shall be used.

In addition to the requirements in section 4.5.4.2, unless they are immediately cancelled upon their Issuance, GOs are issued for the Output that is measured in line with regulated settlement procedures and that is injected into:

1. a Distribution or Transmission system (where Distribution and Transmission are defined as in (EU) 2009/73 for gas); or
2. another type of transportation system for the case of liquefied and compressed gases for which the corresponding GO shall be issued.

5.3 Hydrogen

5.3.1 Applicability

The provisions of this Chapter apply to GO Schemes for Hydrogen in addition to those provisions specified in sections 1, 2, 3 and 4.

The provisions of this chapter 5.1 shall apply to:

- a) Production Devices that produce the Energy Carrier Hydrogen; and
- b) GOs that convey the Attributes of Hydrogen;
- c) Registration Functions relating to both of the above.

5.3.2 Additional application information for the registration of a Production Device

In addition to the requirements set out in 4.4.1.3, the applicant shall provide in its application for registration of a Production Device for Hydrogen:

- a) on a simplified energy flow diagram, the location of any compression system, purification system, liquefaction system, Auxiliaries, Import and Export Meters, Storage facility, consumption at the site of the Production Device, and indication of the points where the Energy Carrier becomes available for trade: gas packaging system, injection point into a Hydrogen distribution or transmission grid, injection point into a Hydrocarbon gas distribution or transmission grid.

Note: the GO Scheme may require additional information to be provided concerning the Production Device or other Production Devices operated by the registrant (for example: identification of the Production Devices producing hydrogen with a carbon footprint exceeding a specified benchmark value).

Note: for injection into the natural gas distribution grid: see 5.2.7.2.

5.3.3 Qualification criteria for Production Devices

Note: The GO Scheme may specify criteria for registration of the Production Device

Note: In addition to the purity requirement for Hydrogen, the GO Scheme may specify the minimum pressure at which the Hydrogen must be brought at the Production Device boundary (e.g. 30 bar), for being treated as a Hydrogen Energy Carrier for which GOs may be issued, unless the GOs are immediately cancelled upon issuance for being treated as a Hydrogen Energy Carrier for which GOs may be issued.

5.3.4 Additional criteria for issuing GOs

Note: The GO Scheme may require disclosure of the GHG intensity of the Output of a Production Device for which issuing of GOs is requested, as well as that of Output for which no GOs were issued in a specified time interval preceding the issuing request (for example: requirement that the average emissions of all non-certified Output of the same Production Device in the preceding 12 months be disclosed).

5.3.5 Data to be recorded on the GO

In addition to the information in 4.5.1.1, a GO for Hydrogen may contain the following:

If Output is produced from a mixture of Inputs, consisting of other than only the Input from the Source Type indicated in 4.5.1.1 g) : in addition to the Attribute recorded as the Source Type for which the corresponding GO was Issued, information on those Inputs, Source Type, and their share in total energy Input. This share shall be determined in accordance with the Energy Input Factor.

Note: the GO Scheme may require additional information to be recorded (for example: the average emissions of all non-certified Output in the preceding 12 months, if available).

5.3.6 Inspections

5.3.6.1 Verification of an application for registration of a Production Device

For the purposes of 4.3.5.2, an inspection of a Production Device of Hydrogen is mandatory before the first issuance of GOs for the Output produced by it.

In addition to meeting the requirements in section 4.11.3.2, the audit shall verify that there is continuous and reliable monitoring and recording that the Output has the purity required for being identified as Hydrogen.

5.3.6.2 Verification of Consumption and Production Declarations

An inspection of the Consumption and Production Declarations as in 4.11.4 in relation to any issuing request for GOs for Hydrogen, shall take place at least on an annual basis. The results from the inspection are to be disposed to the Issuing Body.

In addition to meeting the requirements in section 4.11.4, the audit shall verify that the Output for which the Issuing of GOs is requested has the purity required for being identified as Hydrogen, as well as any other characteristic specified by the GO scheme.

5.3.7 Calculation of Nett Energy Production eligible for GO issuing

In addition to the requirements in 4.5.4.2, for the purpose of calculation of Output as in 4.5.5, for determining the energy content of Hydrogen, the lower calorific value shall be used.

5.3.8 GO Scheme perimeter

Unless the GO scheme restricts its perimeter further, the GO Scheme is applicable to any Hydrogen produced and any Hydrogen consumed within its Domain.

Note: the GO Scheme may further restrict its perimeter to hydrogen produced and consumed from Production Devices meeting specified criteria.

5.4 Heating and Cooling

5.4.1 Applicability

The provisions of this chapter apply to GO Schemes for Heating and/or Cooling in addition to those provisions specified in sections 1, 2, 3 and 4.

The provisions of this Chapter 5.4 shall apply to:

- a) Production Devices that produce the energy carrier Heating and/or Cooling; and
- b) GOs that convey the Attributes of Heating and/or Cooling;
- c) Registration Functions relating to both of the above.

Note: In case of cogeneration of electricity and heat, GOs can be issued for both.

5.4.2 Additional application information for the registration of a Production Device

In addition to the requirements set out in 4.4.1.3, the applicant shall provide in its application for registration of a Production Device for Heating and/or Cooling:

- a) a simplified energy flow diagram for that Production Device, displaying:
 - 1) flows of Heating, Cooling and of any other Energy Carriers;
 - 2) the location of:
 - i) injection points;
 - ii) Auxiliaries;
 - iii) Import and Export Meters;

- iv) Storage facilities;
- v) consumption at the site of the Production Device;
- b) with regard to the medium used for conveying Heating or Cooling produced by that Production Device:
 - 1) its type, being water, thermal-oil, air, salt or refrigerant;
 - 2) its predominant aggregation state (solid, liquid, gaseous);
 - 3) its maximum supply temperature range, being:
 - i) ≤ 0 °C;
 - ii) > 0 and ≤ 25 °C;
 - iii) > 25 and ≤ 60 °C;
 - iv) > 60 and ≤ 130 °C;
 - v) > 130 and ≤ 300 °C;
 - vi) > 300 and ≤ 500 °C; or
 - vii) > 500 °C
 - 4) in case the aggregation state as in (2) above is gaseous, its maximum supply pressure range, being:
 - i) ≤ 5 barG;
 - ii) > 5 and ≤ 15 barG; or
 - iii) > 15 barG; and
- c) the identity of the of the network through which the Heating or Cooling is supplied, being:
 - 1) the unique identification number (see C.7 in Annex C) which has been assigned to it by the relevant Issuing Body; and
 - 2) optionally, its name.

5.4.3 Qualification criteria for Production Devices

The qualification criteria for a Production Device are that the Production Device is capable of producing Heating and/or Cooling from the energy source for which it is registered.

5.4.4 Obligatory additional information on a GO for Heating or Cooling

In addition those identified in 4.5.1.1, a GO for Heating and Cooling shall contain the following Attributes:

- a) with regard to the medium used for conveying Heating or Cooling produced by that Production Device:
- 1) its type, being water, thermal-oil, air, salt or refrigerant;
 - 2) its predominant aggregation state (solid, liquid, gaseous);
 - 3) its maximum supply temperature range, being:
 - i) ≤ 0 °C;
 - ii) > 0 and ≤ 25 °C;
 - iii) > 25 and ≤ 60 °C;
 - iv) > 60 and ≤ 130 °C;
 - v) > 130 and ≤ 300 °C;
 - vi) > 300 and ≤ 500 °C; or
 - vii) > 500 °C
 - 4) in case the aggregation state mentioned in (2) above is gaseous, its maximum supply pressure range, being:
 - i) ≤ 5 barG;
 - ii) > 5 and ≤ 15 barG; or
 - iii) > 15 barG; and
- b) the identity of the network through which the Heating or Cooling is supplied, being the unique identification number (see annex C.7) which has been assigned to it by the relevant Issuing Body.

5.4.5 Additional optional information on a GO for Heating or Cooling

In addition to those identified in 4.5.1.2, a Domain GO Scheme may provide that a GO for Heating or Cooling contains the following Attributes:

- a) the name of the network through which the Heating or Cooling is supplied.

5.4.6 Limitations for cancellation of GOs for Heating or Cooling

To Disclose the Attributes of Heating or Cooling supplied, only GOs for Heating or Cooling may be Cancelled of which the Attributes identified in 5.4.4a) conform to the physical properties of such supply.

The cancellation procedures of the Domain GO Scheme shall comprise the relevant controls to ensure such.

Note: This secures the credibility and reliability of the GO scheme for Heating and Cooling. For example, district heating is not normally supplied at ≥ 450 °C, so it would be confusing if for Disclosure of such, GOs bearing that temperature range could be Cancelled.

The provisions of a Domain GO Scheme may be such that to Disclose the Attributes of Heating or Cooling supplied through a network, only GOs for Heating or Cooling may be Cancelled bearing the identity of that network in accordance with 5.4.4b) above.

5.4.7 Inspections

5.4.7.1 Verification of an application for registration of a Production Device

For the purposes of 4.3.5.2, an inspection of a Production Device of Heating or Cooling by a Production Auditor is mandatory.

5.4.7.2 Consumption Declaration

In addition to 4.5.5.1.1, a person submitting a GO Issuing Request in relation to a Production Device for Heating and/or Cooling which uses one or more Renewable Energy sources from biological origin shall submit, in respect of the same period as that to which the GO Issuing Request relates, a Consumption Declaration. Such Consumption Declaration shall contain the information necessary for determining the Energy Input Factor for that period in accordance with 4.5.5.1.3.

5.4.8 Calculation of Nett Energy Production eligible for GO issuing

In line with section 4.5.4.2, Heating or Cooling GOs shall not be Issued in respect of Heating or Cooling consumed by production Auxiliaries.

The Output of a Heating or Cooling Production Device shall be determined as the nett production of Heating or Cooling:

- a) where the Heating or Cooling medium circulates in a closed circuit, the Output shall be determined based on the difference between the energy content at the exit and entry of the Production Device (taking into account relevant differences in supply and return temperature and pressure);
- b) where the Heating or Cooling medium does not return to the Production Device, the Output shall be determined based on the difference between the energy content of the Heating or Cooling medium at the entry and the exit of the Production Device.

In addition to the requirements in section 4.5.4.2, unless they are immediately cancelled upon Issuance, GOs may only be issued for Heating or Cooling are only issued for Heating or Cooling which is:

- a) injected into a network that supplies one or more customer(s) which is another entity than the producer, and
- b) which is physically connected to the network the Heating or Cooling is delivered to, and
- c) the Domain GO Scheme provides that the quantity of both production and consumption in that grid are taken into account in the residual mix calculations, and that consumption on that grid is subject to a legal Disclosure requirement backed with either:
 - iii. cancelling GOs for consumption of electricity with specific Attributes, or
 - iv. Residual mix.

Annex A (normative)

Energy Source Type codes

This Annex A establishes the permissible values of energy Source Type as referred to in section 4.5.1.1g).

The energy Source Type code on a GO establishes the energy source from which Output, for which the GO is issued, was generated. This relates to the original energy source with which energy is produced, not to intermediate energy carriers.

On each GO, only one code is mentioned for the Source Type.

Definitions

Definitions from the Renewable Energy Directive 2018/2001/EU

'Agricultural biomass' means biomass produced from agriculture;

'Agricultural, aquaculture, fisheries and forestry residues' means residues that are directly generated by agriculture, aquaculture, fisheries and forestry and that do not include residues from related industries or processing;

'Biomass' means the biodegradable fraction of products, waste and residues from biological origin from agriculture, including vegetal and animal substances, from forestry and related industries, including fisheries and aquaculture, as well as the biodegradable fraction of waste, including industrial and municipal waste of biological origin;

'Food and feed crops' means starch-rich crops, sugar crops or oil crops produced on agricultural land as a main crop excluding residues, waste or ligno-cellulosic material and intermediate crops, such as catch crops and cover crops, provided that the use of such intermediate crops does not trigger demand for additional land;

'Forest biomass' means biomass produced from forestry;

'Ligno-cellulosic material' means material composed of lignin, cellulose and hemicellulose, such as biomass sourced from forests, woody energy crops and forest-based industries' residues and wastes;

'Renewable' in this document refers to **'Energy from renewable sources'** or **'Renewable energy'** which means energy from renewable non-fossil sources, namely wind, solar (solar thermal and solar photovoltaic) and geothermal energy, ambient energy, tide, wave and other ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas, and biogas. When the Source Type consists of Renewable and non-renewable parts, the category Renewable refers only to the Renewable proportion of the Source Type.

'Residue' means a substance that is not the end product(s) that a production process directly seeks to produce; it is not a primary aim of the production process and the process has not been deliberately modified to produce it;

'Waste heat and cold' means unavoidable heat or cold generated as by-product in industrial or power generation installations, or in the tertiary sector, which would be dissipated unused in air or water without access to a district heating or cooling system, where a cogeneration process has been used or will be used or where cogeneration is not feasible;

Definitions from the Waste Directive 2008/98/EU

‘Bio-waste’ means biodegradable garden and park waste, food and kitchen waste from households, restaurants, caterers and retail premises and comparable waste from food processing plants;

‘By-product’ means a substance or object, resulting from a production process, the primary aim of which is not the production of that item, may be regarded as not being Waste but as being a by-product only if the following conditions are met:

- (a) further use of the substance or object is certain;
- (b) the substance or object can be used directly without any further processing other than normal industrial practice;
- (c) the substance or object is produced as an integral part of production process; and
- (d) further use is lawful, i.e. the substance or object fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

‘Waste’ means any substance or object which the holder discards or intends or is required to discard, excluding substances that have been intentionally modified or contaminated in order to meet this definition;

Further conventions

‘Liquid sewage sludge’ means sewage sludge with dry matter content below 10% (%weight).

‘Solid sewage sludge’ means sewage sludge with dry matter content 10% or higher (%weight);

‘Manure’ (also called dung) means any excrement and/or urine of farmed animals other than farmed fish, with or without litter (EC Regulation 1069/2009);

‘Slurry (or liquid manure)’ means manure with dry matter content below 10% (%weight);

‘Solid manure’ means manure with dry matter content 10% or higher (%weight);

‘Sewage sludge’ means biodegradable residue from water treatment plants.

Table A.1 — Energy Source codes

| Level 1 | | Level 2 | | Level 3 | | Level 4 | | Full code |
|---------|-------------|---------|-------------|---------|---------------------------------|---------|-------------|-----------|
| Code | Description | Code | Description | Code | Description | Code | Description | |
| 0 | Unspecified | 0 | Unspecified | 0 | Unspecified | 0 | Unspecified | F0000000 |
| 1 | Renewable | 0 | Unspecified | 0 | Unspecified | 0 | Unspecified | F0100000 |
| | | | | 1 | Municipal waste | 1 | Biogenic | F01010101 |
| | | 1 | Solid | 0 | Unspecified | 0 | Unspecified | F01010000 |
| | | | | 2 | Industrial and commercial waste | 1 | Biogenic | F01010201 |

| Level 1 | | Level 2 | | Level 3 | | Level 4 | | |
|---------|-------------|---------|-------------|---------|---------------------------|---------|--|-----------|
| Code | Description | Code | Description | Code | Description | Code | Description | Full code |
| | | | | | | 2 | Sewage sludge | F01010202 |
| | | | | 3 | Biomass from forestry | 0 | Unspecified | F01010300 |
| | | | | | | 1 | Wood and other forestry products | F01010301 |
| | | | | | | 2 | Forestry by-products, residues & waste | F01010302 |
| | | | | | | 3 | Saw products, by-products, residues, and waste | F01010303 |
| | | | | 4 | Animal Fats | 0 | Unspecified | F01010400 |
| | | | | 5 | Biomass from agriculture | 0 | Unspecified | F01010500 |
| | | | | | | 1 | Agricultural products (unspecified) | F01010501 |
| | | | | | | 2 | Agricultural by-products, residues & waste | F01010502 |
| | | | | | | 3 | Food and feed crops (unspecified) | F01010503 |
| | | | | | | 4 | Food and feed crops: Cereals | F01010504 |
| | | | | | | 5 | Food and feed crops: Tubers and root crops | F01010505 |
| | | | | | | 6 | Energy crops (unspecified) | F01010506 |
| | | | | | | 7 | Grassy energy crops | F01010507 |
| | | | | | | 8 | Cover crops or intermediate crops | F01010508 |
| | | | | | | 9 | Manure | F01010509 |
| | | | | | | 10 | Algae | F01010510 |
| | | | | | | 11 | Seaweed | F01010511 |
| | | | | 6 | Aquaculture and fisheries | 0 | Unspecified | F01010600 |

| Level 1 | | Level 2 | | Level 3 | | Level 4 | | |
|---------|-------------|---------|-------------|---------|---|---------|-------------------------------------|-----------|
| Code | Description | Code | Description | Code | Description | Code | Description | Full code |
| | | | | | residues & waste | | | |
| | | | | 7 | Bio-waste | 0 | Unspecified | F01010700 |
| | | | | 8 | Mix of energy crops and organic waste or residues | 0 | Unspecified | F01010800 |
| | | | | | | 1 | Energy crops and agricultural waste | F01010801 |
| | | | | 9 | Mix of energy crops, manure and waste or residues | 0 | Unspecified | F01010900 |
| | | | | 10 | Sludge | 00 | Unspecified | F01100000 |
| | | | | | | | | |
| | | 2 | Liquid | 0 | Unspecified | 0 | Unspecified | F01020000 |
| | | | | 1 | Municipal biodegradable waste | 0 | Unspecified | F01020100 |
| | | | | 2 | Black liquor | 0 | Unspecified | F01020200 |
| | | | | 3 | Pure plant oil | 0 | Unspecified | F01020300 |
| | | | | | | 1 | Rapeseed (Brassica napus L.) | F01020301 |
| | | | | | | 2 | Sunflower (Helianthus annuus L.) | F01020302 |
| | | | | | | 3 | Oil palm (Elaeis guineensis Jacq.) | F01020303 |
| | | | | | | 4 | Coconut (Cocos nucifera L.) | F01020304 |
| | | | | | | 5 | Yatropha | F01020305 |
| | | | | | | 4 | Waste plant oil | 0 |
| | | | | 5 | Refined vegetable oil | 0 | Unspecified | F01020500 |
| | | | | | | 1 | Biodiesel (mono-alkyl ester) | F01020501 |

| Level 1 | | Level 2 | | Level 3 | | Level 4 | | | |
|---------|-------------|---------|-------------|---------|-----------------------------------|------------|----------------------------------|----------------------------------|-----------|
| Code | Description | Code | Description | Code | Description | Code | Description | Full code | |
| | | | | | | 2 | Biogasoline (C6-C12 hydrocarbon) | F01020502 | |
| | | | | 6 | Organic waste and residues | 0 | Unspecified | F01020600 | |
| | | | | | | 1 | Agricultural waste and residues | F01020601 | |
| | | | | | | 2 | Industrial waste and residues | F01020602 | |
| | | | | | | 3 | Aquaculture and fishery | F01020603 | |
| | | | | | | 4 | Sewage | F01020604 | |
| | | | | 7 | Slurry | 0 | Unspecified | F01020700 | |
| | | 3 | Gaseous | 0 | Unspecified | 0 | Unspecified | F01030000 | |
| | | | | 1 | Landfill gas | 0 | Unspecified | F01030100 | |
| | | | | 2 | Sewage gas* | 0 | Unspecified | F01030200 | |
| | | | | 3 | Agricultural gas* | 0 | Unspecified | F01030300 | |
| | | | | | | 1 | Pig manure | F01030301 | |
| | | | | | | 2 | Cow manure | F01030302 | |
| | | | | | | 3 | Chicken manure | F01030303 | |
| | | | | | | 4 | Unspecified manure | F01030304 | |
| | | | | | | 5 | Energy crops | F01030305 | |
| | | | | 4 | Gas from organic waste digestion* | 0 | Unspecified | F01030400 | |
| | | | | 5 | Process gas* | 1 | Biogenic | F01030501 | |
| | | 4 | Heat | 1 | Solar | 0 | Unspecified | F01040100 | |
| | | | | | 2 | Geothermal | 0 | Unspecified | F01040200 |
| | | | | | | | 1 | Conventional geothermal heat | F01040201 |
| | | | | | | | 2 | Enhanced dry bed geothermal heat | F01040202 |

| Level 1 | | Level 2 | | Level 3 | | Level 4 | | | | |
|---------|-------------|---------|----------------------------|---------|----------------------|-----------|---------------------------------------|------------|-------------|-----------|
| Code | Description | Code | Description | Code | Description | Code | Description | Full code | | |
| | | | | 3 | Aerothermal | 0 | Unspecified | F01040300 | | |
| | | | | 4 | Hydrothermal | 0 | Unspecified | F01040400 | | |
| | | | | 5 | Process heat | 1 | Biogenic | F01040501 | | |
| | | | | 6 | Waste heat and cold | 0 | Unspecified | F01040600 | | |
| | | | | | | 1 | By-product in industrial installation | F01040601 | | |
| | | | | | | 2 | By-product in power generation | F01040602 | | |
| | | | | | | 3 | By-product in tertiary sector | F01040603 | | |
| | | 5 | Mechanical source or other | 0 | Unspecified | 0 | Unspecified | F01050000 | | |
| | | | | 1 | Wind | 0 | Unspecified | F01050100 | | |
| | | | | 2 | Hydro & marine | 0 | Unspecified | F01050200 | | |
| Fossil | | 0 | Unspecified | 0 | Unspecified | 0 | Unspecified | F02000000< | | |
| | | 1 | Solid | 0 | Unspecified | 0 | Unspecified | F02010000 | | |
| | | | | 1 | Hard coal | 0 | Unspecified | 0 | Unspecified | F02010100 |
| | | | | | | 1 | Anthracite | F02010101 | | |
| | | | | | | 2 | Bituminous coal | F02010102 | | |
| | | | | | | 3 | Coking coal | F02010103 | | |
| | | | | | | 4 | Coke-oven coke | F02010104 | | |
| | | | | | | 5 | Lignite coke | F02010105 | | |
| | | | | | | 2 | Brown coal | 0 | Unspecified | 0 |
| | | | | 1 | Sub-bituminous coal | | | F02010201 | | |
| | | | | 2 | Lignite | | | F02010202 | | |
| | | | | 3 | Brown coal briquette | | | F02010203 | | |
| | | | | 4 | Peat briquette | F02010204 | | | | |
| | | | | 3 | Peat | 0 | Unspecified | F02010300 | | |
| | | | | 4 | Municipal waste | 0 | Unspecified | F02010400 | | |

| Level 1 | | Level 2 | | Level 3 | | Level 4 | | |
|---------|-------------|---------|-------------|---------|---------------------------------|---------|------------------------|-----------|
| Code | Description | Code | Description | Code | Description | Code | Description | Full code |
| | | | | 5 | Industrial and commercial waste | 0 | Unspecified | F02010500 |
| | | | | | | 1 | Non-renewable | F02010501 |
| | | 2 | Liquid | 0 | Unspecified | 0 | Unspecified | F02020000 |
| | | | | 1 | Crude oil | 0 | Unspecified | F02020100 |
| | | | | | | 1 | Shale oil | F02020101 |
| | | | | 2 | Natural gas liquids (NGL) | 0 | Unspecified | F02020200 |
| | | | | 3 | Petroleum products | 0 | Unspecified | F02020300 |
| | | | | | | 1 | Ethane | F02020301 |
| | | | | | | 2 | Naphtha | F02020302 |
| | | | | | | 3 | Aviation gasoline | F02020303 |
| | | | | | | 4 | Motor gasoline | F02020304 |
| | | | | | | 5 | Aviation turbine fuel | F02020305 |
| | | | | | | 6 | Other kerosene | F02020306 |
| | | | | | | 7 | Gas/diesel oil | F02020307 |
| | | | | | | 8 | Fuel oil, low-sulphur | F02020308 |
| | | | | | | 9 | Fuel oil, high-sulphur | F02020309 |
| | | | | | | 10 | Liquid Petroleum Gas | F02020310 |
| | | | | | | 11 | Orimulsion | F02020311 |
| | | | | | | 12 | Bitumen | F02020312 |
| | | | | | | 13 | Lubricants | F02020313 |
| | | | | | | 14 | Petroleum coke | F02020314 |
| | | | | | | 15 | Refinery Feedstock | F02020315 |
| | | 3 | Gaseous | 0 | Unspecified | 0 | Unspecified | F02030000 |
| | | | | 1 | Natural gas | 0 | Unspecified | F02030100 |
| | | | | 2 | Coal-derived gas | 0 | Unspecified | F02030200 |
| | | | | | | 1 | Blast furnace gas | F02030201 |
| | | | | | | 2 | Coke-oven gas | F02030202 |

| Level 1 | | Level 2 | | Level 3 | | Level 4 | | |
|---------|-------------|---------|-------------|---------|---------------------|---------|---------------------------------------|-----------|
| Code | Description | Code | Description | Code | Description | Code | Description | Full code |
| | | | | 3 | Petroleum products | 0 | Unspecified | F02030300 |
| | | | | | | 1 | Propane | F02030301 |
| | | | | | | 2 | Butane | F02030302 |
| | | | | | | 3 | Refinery gas | F02030303 |
| | | | | | | 4 | Chemical waste gas | F02030304 |
| | | | | 4 | Municipal gas plant | 0 | Unspecified | F02030400 |
| | | | | 5 | Process gas | 0 | Unspecified | F02030500 |
| | | | | | | 1 | Carbon monoxide | F02030501 |
| | | | | | | 2 | Methane | F02030502 |
| | | | | | | 3 | Hydrogen (fossil sourced) | F02030503 |
| | | | | | | 4 | Phosphor gas | F02030504 |
| | | | | | | 5 | Oxy gas | F02030505 |
| | | 4 | Heat | 0 | Unspecified | 0 | Unspecified | F02040000 |
| | | | | | | 1 | Non-renewable | F02040001 |
| | | | | 1 | Process heat | 0 | Unspecified | F02040100 |
| | | | | | | 1 | Non-renewable | F02040101 |
| | | | | 2 | Waste heat and cold | 0 | Unspecified | F02040200 |
| | | | | | | 1 | By-product in industrial installation | F02040201 |
| | | | | | | 2 | By-product in power generation | F02040202 |
| | | | | | | 3 | By-product in tertiary sector | F02040203 |
| 3 | Nuclear | 1 | Solid | 1 | nuclear fuel | 0 | Unspecified | F03010100 |
| | | | | | | 1 | UOX | F03010101 |
| | | | | | | 2 | AGR | F03010102 |
| | | | | | | 3 | MOX | F03010103 |

(*) However, this energy source type code is in use, it is proposed to replace it by corresponding coding under Renewable-solid. The GOs with codes with asterisk are allowed to be issued for production periods ending on 31st of December 2022 latest.

Annex B
(normative)

Technology codes

This Annex B establishes the permissible values of Technology Type as referred to in section 4.5.1.1h).

The Technology Type code on a GO establishes the technology of the Production Device which generated the Output, for which the GO is issued.

On each GO, only one code is mentioned for the Technology Type.

Table B.1 — Technology codes for production of Electricity

| Level 1 | | Level 2 | | Level 3 | | |
|---------|-----------------------------------|---------|---------------------------------------|---------|----------------------|-----------|
| Code | Description | Code | Description | Code | Description | Full code |
| 1 | Solar | 0 | Unspecified | 0 | Unspecified | T010000 |
| | | 1 | Photovoltaic | 0 | Unspecified | T010100 |
| | | | | 1 | Classic silicon | T010101 |
| | | | | 2 | Thin film | T010102 |
| | | | | 3 | Photovoltaic-thermal | T010103 |
| 2 | Concentration | 0 | Unspecified | T010200 | | |
| 2 | Wind | 0 | Unspecified | 0 | Unspecified | T020000 |
| | | | | 1 | Onshore | T020001 |
| | | | | 2 | Offshore | T020002 |
| 3 | Hydro-electric head installations | 0 | Unspecified | 0 | Unspecified | T030000 |
| | | 1 | Run-of-river head installation | 0 | Unspecified | T030100 |
| | | 2 | Storage head installation | 0 | Unspecified | T030200 |
| | | 3 | Pure pumped storage head installation | 0 | Unspecified | T030300 |
| | | 4 | Mixed pumped storage head | 0 | Unspecified | T030400 |
| 4 | Marine | 0 | Unspecified | 0 | Unspecified | T040000 |
| | | 1 | Tidal | 0 | Unspecified | T040100 |
| | | | | 1 | Onshore | T040101 |
| | | | | 2 | Offshore | T040102 |
| | | 2 | Wave | 0 | Unspecified | T040200 |

| Level 1 | | Level 2 | | Level 3 | | |
|---------|-------------|---------|--|---------|-------------|-----------|
| Code | Description | Code | Description | Code | Description | Full code |
| | | | | 1 | Onshore | T040201 |
| | | | | 2 | Offshore | T040202 |
| | | 3 | Currents | 0 | Unspecified | T040300 |
| | | 4 | Pressure | 0 | Unspecified | T040400 |
| | | 5 | Osmosis | 0 | Unspecified | T040500 |
| 5 | Thermal | 0 | Unspecified | 0 | Unspecified | T050000 |
| | | 1 | Combined cycle gas turbine with heat recovery | 0 | Unspecified | T050100 |
| | | | | 1 | Non-CHP | T050101 |
| | | | | 2 | CHP | T050102 |
| | | 2 | Steam turbine with back-pressure turbine (open cycle) | 0 | Unspecified | T050200 |
| | | | | 1 | Non-CHP | T050201 |
| | | | | 2 | CHP | T050202 |
| | | 3 | Steam turbine with condensation turbine (closed cycle) | 0 | Unspecified | T050300 |
| | | | | 1 | Non-CHP | T050301 |
| | | | | 2 | CHP | T050302 |
| | | 4 | Gas turbine with heat recovery | 0 | Unspecified | T050400 |
| | | | | 1 | Non-CHP | T050401 |
| | | | | 2 | CHP | T050402 |
| | | 5 | Internal combustion engine | 0 | Unspecified | T050500 |
| | | | | 1 | Non-CHP | T050501 |
| | | | | 2 | CHP | T050502 |
| | | 6 | Micro-turbine | 0 | Unspecified | T050600 |
| | | | | 1 | Non-CHP | T050601 |
| | | | | 2 | CHP | T050602 |
| | | 7 | Stirling engine | 0 | Unspecified | T050700 |
| | | | | 1 | Non-CHP | T050701 |
| | | | | 2 | CHP | T050702 |
| | | 8 | Fuel cell* | 0 | Unspecified | T050800 |
| | | | | 1 | Non-CHP | T050801 |
| | | | | 2 | CHP | T050802 |
| | | 9 | Steam engine | 0 | Unspecified | T050900 |
| | | | | 1 | Non-CHP | T050901 |
| | | | | 2 | CHP | T050902 |
| | | 10 | Organic rankine cycle | 0 | Unspecified | T051000 |
| | | | | 1 | Non-CHP | T051001 |

| Level 1 | | Level 2 | | Level 3 | | |
|---------|------------------|---------|---------------------|---------|-------------|-----------|
| Code | Description | Code | Description | Code | Description | Full code |
| | | | | 2 | CHP | T051002 |
| 6 | Nuclear | 0 | Unspecified | 0 | Unspecified | T060000 |
| | | 1 | Heavy-water reactor | 0 | Unspecified | T060100 |
| | | 2 | Light water reactor | 0 | Unspecified | T060200 |
| | | 3 | Breeder | 0 | Unspecified | T060300 |
| | | 4 | Graphite reactor | 0 | Unspecified | T060400 |
| 7 | Other | 0 | Unspecified | 0 | Unspecified | T070000 |
| 8 | Electro-chemical | 0 | Unspecified | 0 | Unspecified | T080000 |
| | | 1 | Fuel cell | 0 | Unspecified | T080100 |
| | | | | 1 | Non-CHP | T080101 |
| | | | | 2 | CHP | T080102 |

(*) However, this technology code is in use, it is proposed to replace it by the T0801xx coding.

Table B.2 — Technology codes for production of Hydrocarbon gas - Network-compatible Gases: Mxxxxxx

By definition, GOs with technology codes starting with MXXXXXX (Network Compatible Gas) are complying with the technical rules for injection in the natural gas network, as this category of technology codes is used for gaseous energy carriers that comply with the technical standards for injecting gas in the natural gas network.

Note: in case of hydrogen injected into the natural gas network, the technology codes of Table B4 apply to indicate the production technology of the hydrogen for which in this case a GO is issued for the energy carrier Hydrocarbon gas and for the type of gas being Network-Compatible gas.

| Level 1 | | Level 2 | | Level 3 | | |
|---------|---------------------|---------|--------------|---------|------------------------|-----------|
| Code | Description | Code | Description | Code | Description | Full code |
| 01 | Anaerobic digestion | 00 | Unspecified | 00 | Unspecified | M010000 |
| | | 01 | Fermentation | 00 | Unspecified | M010100 |
| | | | | 01 | Dry fermentation | M010101 |
| | | | | 02 | Wet fermentation | M010102 |
| 02 | Gasification | 00 | Unspecified | 00 | Unspecified | M020000 |
| 03 | Chemical synthesis | 00 | Unspecified | 00 | Unspecified | M030000 |
| | | 01 | Methanation | 00 | Unspecified | M030100 |
| | | | | 01 | Catalytic methanation | M030101 |
| | | | | 02 | Biological methanation | M030102 |

Table B.3 — Technology codes for production of Hydrocarbon gas - Other Gases: Gxxxxxx

| Level 1 | | Level 2 | | Level 3 | | |
|---------|---------------------|---------|-------------------------------|---------|------------------------|-----------|
| Code | Description | Code | Description | Code | Description | Full code |
| 01 | Anaerobic digestion | 00 | Unspecified | 00 | Unspecified | G010000 |
| | | 01 | Fermentation | 00 | Unspecified | G010100 |
| | | | | 01 | Dry fermentation | G010101 |
| | | | | 02 | Wet fermentation | G010102 |
| 02 | Gasification | 00 | Unspecified | 00 | Unspecified | G020000 |
| 03 | Chemical synthesis | 00 | Unspecified | 00 | Unspecified | G030000 |
| | | 01 | Production of Hydrocarbon Gas | 00 | Unspecified | G030100 |
| | | | | 01 | Catalytic methanation | G030101 |
| | | | | 02 | Biological methanation | G030102 |

Table B.4 — Technology codes for production of Hydrogen: Hxxxxxx

| Level 1 | | Level 2 | | Level 3 | | |
|---------|---------------------------|---------|------------------|---------|--------------|-----------|
| Code | Description | Code | Description | Code | Description | Full code |
| 01 | Water Electrolysis | 00 | Unspecified | 00 | Unspecified | H010000 |
| | | 01 | Low temperature | 00 | Unspecified | H010100 |
| | | | | 01 | Main product | H010101 |
| | | 02 | High temperature | 00 | Unspecified | H010200 |
| 01 | Main product | | | H010201 | | |
| 02 | Chlor-alkali electrolysis | 00 | Unspecified | 00 | Unspecified | H020000 |
| | | | | 01 | By-product | H020001 |
| 03 | Steam Methane Reforming | 00 | Unspecified | 00 | Unspecified | H030000 |
| | | 01 | Without CCS/CCU | 00 | Unspecified | H030100 |
| | | | | 01 | Main product | H030101 |
| | | 02 | With CCS | 00 | Unspecified | H030200 |
| | | | | 01 | Main product | H030201 |
| | | 03 | With CCU | 00 | Unspecified | H030300 |
| 01 | Main product | | | H030301 | | |
| 04 | Partial Oxidation | 00 | Unspecified | 00 | Unspecified | H040000 |
| 05 | Autothermal reforming | 00 | Unspecified | 00 | Unspecified | H050000 |
| 06 | Methanol reforming | 00 | Unspecified | 00 | Unspecified | H060000 |
| 07 | Ammonia reforming | 00 | Unspecified | 00 | Unspecified | H070000 |

| Level 1 | | Level 2 | | Level 3 | | |
|---------|------------------------------|---------|-----------------|---------|-------------|-----------|
| Code | Description | Code | Description | Code | Description | Full code |
| 08 | Gasification | 00 | Unspecified | 00 | Unspecified | H080000 |
| 09 | Photobiological | 00 | Unspecified | 00 | Unspecified | H090000 |
| 10 | Thermocatalysis ¹ | 00 | Unspecified | 00 | Unspecified | H100000 |
| | | 01 | Water splitting | 00 | Unspecified | H100100 |
| 11 | Photocatalysis ² | 00 | Unspecified | 00 | Unspecified | H110000 |
| | | 01 | Water splitting | 00 | Unspecified | H110100 |
| 12 | Pyrolysis | 00 | Unspecified | 00 | Unspecified | H120000 |
| | | 01 | Of methane | 00 | Unspecified | H120100 |

- (1) Thermocatalysis: The production of hydrogen in a catalytic process utilizing heat as a source of energy, without making use of hydrocarbons as a feedstock.
- (2) Photocatalysis: The production of hydrogen in a catalytic process utilizing light as a source of energy, without reliance on photosynthetic organisms.

Table B.5 — Technology codes for Heating or Cooling: Qxxxxxx

| Level 1 | | Level 2 | | Level 3 | | |
|---------|--------------------------------|---------|---------------------|---------|-----------------------|-----------|
| Code | Description | Code | Description | Code | Description | Full code |
| 01 | Combustion for heating purpose | 00 | Unspecified | 00 | Unspecified | Q010000 |
| | | 01 | Flue gas Condensing | 00 | Unspecified | Q010100 |
| | | | | 01 | CHP | Q010101 |
| | | | | 02 | Non-CHP | Q010102 |
| | | 02 | Non-condensing | 00 | Unspecified | Q010200 |
| | | | | 01 | CHP | Q010201 |
| 02 | Non-CHP | | | Q010202 | | |
| 02 | Heat pump | 00 | Unspecified | 00 | Unspecified | Q020000 |
| | | 01 | Closed system | 00 | Unspecified | Q020100 |
| | | | | 01 | Compression | Q020101 |
| | | | | 02 | Absorption | Q020102 |
| | | 02 | Open system | 00 | Unspecified | Q020200 |
| | | | | 01 | Thermal recompression | Q020201 |
| 02 | Mechanical recompression | | | Q020202 | | |

| Level 1 | | Level 2 | | Level 3 | | |
|---------|---------------------------------|---------|-------------------|---------|----------------------|-----------|
| Code | Description | Code | Description | Code | Description | Full code |
| 03 | Heating or cooling recovery | 00 | Unspecified | 00 | Unspecified | Q030000 |
| 04 | Geothermal pumping installation | 00 | Unspecified | 00 | Unspecified | Q040000 |
| | | 01 | CHP | 00 | Unspecified | Q040100 |
| | | 02 | Non-CHP | 00 | Unspecified | Q040200 |
| 05 | Solar thermal collector | 01 | Non-concentrating | 00 | Unspecified | Q050100 |
| | | | | 01 | Flat plate collector | Q050101 |
| | | | | 02 | Evacuated collector | Q050102 |
| | | | | 03 | Photovoltaic-ther | Q050103 |
| | | 02 | Concentrating | 00 | Unspecified | Q050200 |
| | | | | 01 | Parabolic trough | Q050201 |
| | | | | 02 | Solar power tow | Q050202 |
| | | | | 03 | Linear reflector F | Q050203 |
| | | | | 04 | Dish reflector | Q050204 |
| | | | | | | |
| 06 | Electrical resistance heating | 00 | Unspecified | 00 | Unspecified | Q060000 |
| | | 01 | Electrical boiler | 00 | Unspecified | Q060100 |

Annex C (normative)

Coding structures

C.1 Introduction

In order to ensure uniqueness of all data identifiers, this standard implements a methodology of coding.

C.2 Coding of Registration Databases

Each Registration Database shall maintain at least one GS1 prefix to be used in accordance with the GS1 numbering structure. The Registration Database Prefix forms an essential part of the coding for energy Production Devices and GOs. A Company Prefix is a numeric identifier of between 6 and 10 digits in length.

The Competent Body Company Prefix is used as the Competent Body ID. Where a Competent Body maintains more than one prefix, one prefix may be chosen as the Competent Body ID.

EXAMPLE Competent Body Company Prefixes are:

51234567 (8-digit Company Prefix);

598765432 (9-digit company prefix).

C.3 Coding of certificates

Certificates will be coded in accordance with Global Individual Asset Identifier (GIAI) (AI 8004), an element of the GS1 numbering structure. The certificate number is always exactly 30 digits long.

Table C.1 — Coding of certificates

| Format of the element string | | | |
|------------------------------|--|---------------------------------|-----------|
| | Global Individual Asset Identifier | | |
| | GS1 Company Prefix for the Competent Body | Individual Asset | Reference |
| | $N_1 \dots N_i$ | $N_{i+1} \dots$ variable length | N_{30} |

NOTE i represents the length of the Company Prefix for the Competent Body.

The GIAI uses the GS1 Company Prefix of the Competent Body assigning the Asset Reference. The structure and numbering of the Individual Asset Reference is determined by the relevant Competent Body. Competent Bodies may adopt any numbering methodology appropriate to the coding structure, although it is recommended that sequential Individual Asset Reference numbers be assigned.

Although the GS1 specification for GIAI allows the Individual Asset Reference to contain all characters contained in Table 1 of ISO/IEC 646:1991, for the purposes of Certificate coding only numeric characters are permitted.

EXAMPLE GIAI-based Certificate Number:

512345670000000000000000000000001234 (8-digit Company Prefix with 22-digit Individual Asset Reference)

C.4 Coding of Production Devices

Production Devices will be coded in accordance with Global Service Relation Number (GSRN) (AI 8018), an element of the GS1 numbering structure.

Table C.2 — Coding of Production Device s

| Format of the element string | | | | | | | | | | | | | | | | | |
|------------------------------|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | Global Service Relation Number | | | | | | | | | | | | | | | | |
| | GS1 Company Prefix For the Competent Body | | | | | | | | Service Reference | | | | | | | Check digit | |
| | N ₁ | N ₂ | N ₃ | N ₄ | N ₅ | N ₆ | N ₇ | N ₈ | N ₉ | N ₁₀ | N ₁₁ | N ₁₂ | N ₁₃ | N ₁₄ | N ₁₅ | N ₁₆ | N ₁₇ |

The GSRN uses the GS1 Company Prefix of the Competent Body assigning the Service Reference. The Service Reference is assigned by the Competent Body and relates to an individual Production Device. The structure and content of the Service Reference number is at the discretion of the Competent Body.

The Check Digit is calculated as shown below. Its verification, which shall be carried out in the application software, ensures that the number is correctly composed.

Table C.3 — Check digit calculation

| Check digit calculation | | | | | | | | | | | | | | | | | | |
|-------------------------|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | Global service relation number | | | | | | | | | | | | | | | | | |
| | GS1 Company Prefix For the Competent Body | | | | | | | | Service Reference | | | | | | | Check digit | | |
| | N ₁ | N ₂ | N ₃ | N ₄ | N ₅ | N ₆ | N ₇ | N ₈ | N ₉ | N ₁₀ | N ₁₁ | N ₁₂ | N ₁₃ | N ₁₄ | N ₁₅ | N ₁₆ | N ₁₇ | N ₁₈ |
| | Multiply value of each position by | | | | | | | | | | | | | | | | | |
| | x3 | x1 | x3 | x1 | x3 | x1 | x3 | x1 | x3 | x1 | x3 | x1 | x3 | x1 | x3 | x1 | x3 | |
| | Accumulated results = 'sum' | | | | | | | | | | | | | | | | | |
| | Check digit = (nearest multiple of 10 ≥ 'sum') – 'sum' | | | | | | | | | | | | | | | | | |

Table C.4 — Example check digit calculation

| Example check digit calculation | | | | | | | | | | | | | | | | | | | |
|---------------------------------|--|----|----|----|----|----|----|----|----|-------------------|----|----|----|----|----|----|----|-------------|------|
| Start number | Global Service Relation Number | | | | | | | | | | | | | | | | | | |
| | GS1 Company Prefix For the Competent Body | | | | | | | | | Service Reference | | | | | | | | Check digit | |
| Interim | 3 | 7 | 6 | 1 | 0 | 4 | 2 | 5 | 0 | 0 | 2 | 1 | 2 | 3 | 4 | 5 | 6 | | |
| | Multiply value of each position by | | | | | | | | | | | | | | | | | | |
| | x3 | x1 | x3 | x1 | x3 | x1 | x3 | x1 | x3 | x1 | x3 | x1 | x3 | x1 | x3 | x1 | x3 | x1 | x3 |
| Final number | 9 | 7 | 18 | 1 | 0 | 4 | 6 | 5 | 0 | 0 | 6 | 1 | 6 | 3 | 12 | 5 | 18 | | |
| | Accumulated results = 'sum' | | | | | | | | | | | | | | | | | | |
| | Check digit = (nearest multiple of 10 ≥ 'sum') - 'sum' | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 101 |
| | | | | | | | | | | | | | | | | | | | 110 |
| | | | | | | | | | | | | | | | | | | | -101 |
| | | | | | | | | | | | | | | | | | | | =9 |
| | 3 | 7 | 6 | 1 | 0 | 4 | 2 | 5 | 0 | 0 | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 9 | |

EXAMPLE GSRN-based Electricity Generation Installation Numbers are:

512345670000012347 (8-digit Company Prefix with 9-digit Service Reference and single Check Digit)

598765432000001235 (9-digit Company Prefix with 8-digit Service Reference and single Check Digit)

C.5 Coding of Account Holder Account IDs

Each Account Holder shall be assigned a unique account reference by their host IB. The account reference shall be composed as follows:

- IB_ID (2 numeric digits)
- X (single 'X' character)
- 6-character alphanumeric ID (0-9 and A-Z only)
- check character (see below)

An example Account Holder Account ID is 10XRWENETJ.

A check character is a character added to the end of the Account Holder Account ID that validates the authenticity of the code. A simple algorithm is applied to the other digits or letters of the code which yields the check character.

The last character of each of the Account Holder Account ID represents the check character that is calculated from the other characters using the following algorithm. An example of an Account Holder Account ID is 10XRWENETJ.

Calculation of the check character:

- a) The first 9 characters of the code are individualised as follows:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | 0 | X | R | W | E | N | E | T |
|---|---|---|---|---|---|---|---|---|

- b) Where alphabetic characters are present, they are replaced by a numeric value with the value 10 for the letter « A » ; 11 for the letter « B » ; 12 for the letter « C », etc. and 35 for the letter « Z », as follows :

| | | | | | | | | |
|---|---|----|----|----|----|----|----|----|
| 1 | 0 | 33 | 27 | 32 | 14 | 23 | 14 | 29 |
|---|---|----|----|----|----|----|----|----|

- c) Then, the positions are again weighted, beginning with the greatest value to the left and ending with a one at the far right.

| | | | | | | | | |
|----|---|----|----|----|----|----|----|----|
| 1 | 0 | 33 | 27 | 32 | 14 | 23 | 14 | 29 |
| 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 |

- d) Each digit is multiplied by its position weight

| | | | | | | | | |
|----|---|-----|-----|-----|----|----|----|----|
| 10 | 0 | 264 | 189 | 192 | 70 | 92 | 42 | 58 |
|----|---|-----|-----|-----|----|----|----|----|

- e) The products are then summed to give a total value: 917
- f) A modulo 36 (which corresponds to the total number of characters available) is applied to the value 917 with the formula $(36 - \text{MOD}([\text{value}],36))$. This produces a numeric value in the range 1 to 36.

In the above example, the result is 19 which, since it is superior to 9 has to be converted to a letter using a similar mechanism as in Step 2. Number 0 is not an allowed output. Where the check character code is 36, this is represented as the character “[“.

Thus, the code for the above example is: “10XRWENET]”. With an account base of 11XYWZNET, the check character would be “[“, and the full account code would be “11XYWZNET[“.

C.6 Coding of Energy Sources and Technologies

Fuel (or heat source) codes are found in Annex A.

Technology codes are found in Annex B.

C.7 Heating and cooling grid codes

Each Heating or Cooling grid shall maintain at least one GS1 prefix to be used in accordance with the GS1 numbering structure. An identifier to the Domain where the grid is located forms an essential part of the coding.

Annex D
(normative)

Cogeneration GO codes — Uses of Heat

The predominant use of heat >including without limitation<:

- a) heating, including district heating and cooling;
- b) industrial use, including process heating;
- c) agricultural use;
- d) production of biogas.

Annex E (informative) Methodology for quantifying the Carbon Footprint of the Output for which a GO is being Issued

This Annex proposes the methodology for obtaining the quantification of the carbon footprint related to the production of the amount of energy for which the GO is issued, as in 4.5.1.2. d) of this standard .

E.1 General methodology for calculating the carbon footprint of the Output

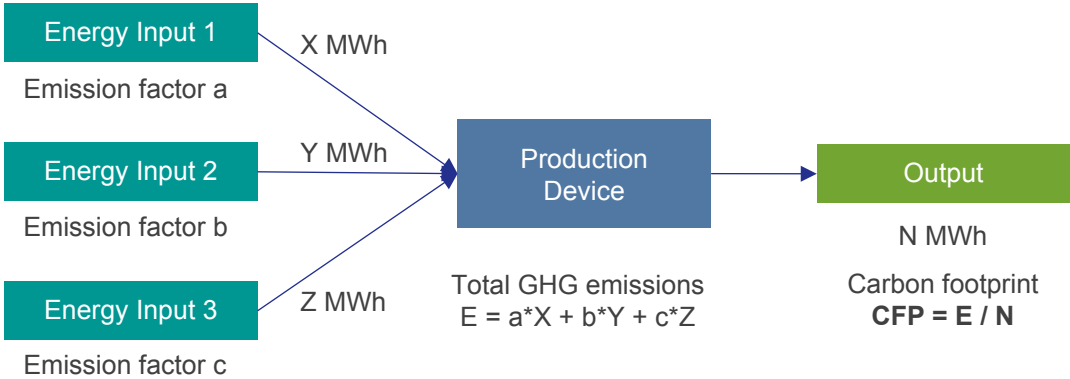
E.1.1 Which emissions to take into account and reference for the methodology

The methodology for quantifying the carbon footprint (CFP) related to the production of the amount of energy for which the GO is issued, is proposed to be based on the ISO 14067 standard, and to be limited to a partial carbon footprint of the corresponding Output. This means that all life cycle emissions shall be considered *except*:

- the emissions from transport and supply to the consumer and,
- the emissions from the manufacturing or building of the capital goods implemented by the product system.

E.1.2 General calculation formula

Based on the emission factor of each of the Inputs, the total carbon footprint can be calculated as follows:



Notes:

- The above chart applies to Production Devices with a single Output produced from energy Inputs ; other cases are covered in the sections E.2 and E.3
- Input and Output energy amounts are measured over a given timeframe
- The emission factor of an Input is the CFP of that Input (gCO₂eq/MWh)

E.1.3 Data needs

The methodology requires the emission factor of the input(s) to be known, which is generally the case in the regulatory/legislative framework. The GO scheme should specify the source of data to

be used. For instance, Annex V and VI of the Renewable Energy Directive provide emission factors for biomass-based feedstocks.

Additional data input for the calculation consists of Inputs and Output(s) over the timeframe for which the corresponding GOs are issued, as determined by Import Meters and Export Meter(s).

E.1.4 Procedure for providing the required data

The above-mentioned data shall be provided by the Registrant to the Issuing Body together with the Production Declaration and the Consumption Declaration.

E.1.5 Verification of the data required for calculating the carbon footprint

At least on an annual basis, an independent auditor with the relevant credentials checks whether the calculation is done in accordance with the abovementioned requirements and any additional documentation where needed in accordance with the provisions of the Domain GO Scheme.

The auditor shall be assigned by the Issuing Body and shall be competent to verify the data on the GO with regards to the carbon footprint.

E.1.6 Argumentation for the proposed methodology

The above methodology follows from the below reasoning.

“Carbon footprint of a product” is defined in ISO 14067 *Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification* as follows:

Carbon footprint (CFP) of a product:

sum of GHG emissions and GHG removals in a product system, expressed as CO₂ equivalents and based on a life cycle assessment using the single impact category of climate change

The above definition includes the following notes:

A CFP can be disaggregated into a set of figures identifying specific GHG emissions and removals. A CFP can also be disaggregated into the stages of the life cycle.

The results of the quantification of the CFP are documented in the CFP study report expressed in mass of CO₂e per functional unit.

Notes:

- The definition of the terms used in the above definition are given by ISO 14067.
- The functional unit is the unit used to measure the output of the product system (e.g. MWh).
- The product system models the life cycle of a product.

The CFP as defined above encompasses all the life-cycles stages of the Energy Carrier constituting the Output, considered as a product, from extraction and processing of the raw materials up to its final use (e.g. combustion in the case of Hydrocarbon gas).

ISO 14067 also defines the notion of “Partial carbon footprint of a product” as follows:

Partial carbon footprint of a product (partial CFP)

sum of GHG emissions and GHG removals of one or more selected process(es) in a product system, expressed as CO₂ equivalents and based on the selected stages or processes within the life cycle

Quantification of Carbon footprint is an established practice for energy products such as biofuels, bioliquids, and biomass fuels (which include biomethane and biohydrogen), as well as fuels of non-biological origin, in order to demonstrate compliance with the applicable sustainability criteria.

For instance:

- Renewable Energy Directive Annexes V and VI provide disaggregated CFP default values for feedstocks used for the production of biofuels, bioliquids, and biomass fuels. Furthermore, these annexes provide a methodology for aggregating these values in order to quantify the carbon footprint of a biofuel, bioliquid, or biomass fuel for regulatory compliance;
- Directive (EU) 2015/652 laying down calculation methods and reporting requirements relating to the quality of petrol and diesel fuels provides CFP values for fuels other than biofuels and electricity.

The above values do not consider emissions from the manufacturing or building of the capital goods (such as the production device) constituting the product system.

Furthermore, the CFP to be recorded on a GO does not include transport and supply to the consumer. This is due to the fact that this part of the life-cycle is undefined at the time GO issuance (production).

Consequently, the carbon footprint quantified in a GO is a *partial* carbon footprint of the corresponding Output, considering all life cycle emissions *except*:

- the emissions from transport and supply to the consumer, and
- the emissions from the manufacturing or building of the capital goods implemented by the product system.

The carbon footprint value recorded on a GO quantifies the above partial footprint of the unit amount (1 MWh) of Output for which the GO is issued.

E.2 Methodology for calculation of the carbon footprint of energy produced in Production Devices having as only product the Output for which GOs are issued

E.2.1 Output produced from a single Input with a single Source Type

For production devices having only one form of Output (electricity, hydrocarbon gas, hydrogen, or heating/cooling) produced from a single Input, the carbon footprint of the Output for which GOs are to be issued is:

Total amount of GHG emissions associated to the Output for the relevant life cycle stages (see par. 1)

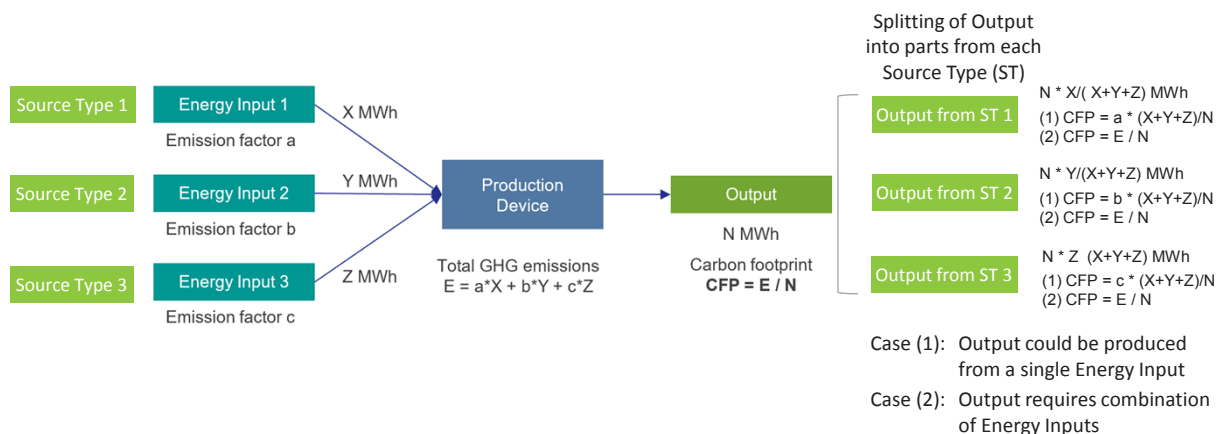
divided by

Output (amount of energy)

E.2.2 Output produced from multiple Inputs, where the production process could equally function with only one of the Inputs

This section covers the case of Output produced from multiple Inputs where the production process implemented by the Production Device could function with only one of the Inputs. This is the case for instance for the production of hydrogen by water electrolysis using electricity from different energy sources, or the production of biomethane from a mixture of biomass feedstocks.

In this case, since it is possible to produce the Energy Carrier constituting the Output from each Input separately, a distinct carbon footprint can be defined for Output from each Input. considering production of Output only from that Input. The corresponding calculation is shown in the chart below under case (1).



The formula shown in the figure above for the CFP of the Output from each Source Type in Case (1) assumes that the energy efficiency of the production device is independent of Source Type. If this is not the case, the CFP of the output from each Source Type, is equal to the emission factor of the energy Input from the considered Source Type divided by the energy efficiency of the production device when using only Energy Input from that Source Type.

E.2.3 Output produced from multiple Inputs, where the production process requires a combination of Inputs

This section covers the case of Output produced from multiple Inputs where the production process implemented by the Production Device requires multiple Inputs to function.

In this case it is generally *not* conceivable to produce the Output with the Production Device using only one of the Inputs. The Output can still be split by convention into parts considered to come from each Input, pro rata the Input.

Nonetheless, the Output remains inherently the result of the combination of the required Inputs. Therefore, the carbon footprint can only be calculated for the total Output, and the Output parts from each Input defined as indicated in the previous paragraph all have the same carbon footprint.

Example

Considering the example of Hydrogen production by plasma gasification of waste, with the following assumptions:

- 80% of the total energy input is constituted by waste, 60% of which is biomass
- 20% of the total energy input is constituted by electricity, 70% of which is from wind (with cancelling of the corresponding GOs) and the remaining 30% is from the grid mix (no GOs)

then the share of Output from biomass is:

$$80\% \times 60\% = 48\%.$$

the share of Output from wind is:

$$20\% \times 70\% = 14\%.$$

the total share of Output from renewable origin is:

$48\% + 14\% = 62\%$

and the total share of Output from non-renewable origin is:

$1 - 62\% = 38\%$

The carbon footprint of all the above shares is the same and quantified as indicated in section E.2.1., and shown in the figure above under case (2).

E.3 Output from a Production Device simultaneously producing other products

This section covers the case of Output produced as a product together with one or more other products.

In this case, the total life-cycle emissions associated to the product system need to be divided for attribution of a share to each product, a procedure called allocation. ISO 14067 defines principles to be followed for allocation of GHG emissions.

If the Production Device cannot be divided into separate product specific production processes , the emissions need to be allocated to each product in accordance with a relevant product property. Allocation pro-rata energy content of each product output is considered the good practice in that case, as emissions intensity of products is closely related to energy content. Note that this allocation only considers the energy content of the outputs (no that of the inputs.). In this case data on the energy content of the Outputs is available from the Consumption Declaration.

If not all co-products have a relevant energy content, (as is the case for hydrogen co-produced with chlorine), allocation needs to be based on another property or consideration. The selection of the basis for allocation is then specific to the Technology Type and should be specified by the GO scheme.

Note: GHG gas allocation that results in allocating each product (including Output) to a share of Input may also impact the quantification of the share of Output that is considered to be of renewable origin.

E.4 Determining the Carbon footprint of Inputs related to Energy Carrier Conversion

In the case of Energy Carrier Conversion, defining the carbon footprint of the Output requires information on the carbon footprint of the Inputs in the form of Energy Carriers.

Unless indicated otherwise in the GOs cancelled to make a claim on the origin of the Input, the carbon footprint of an Energy Carrier is considered to be equal to zero if its Source is wind, solar, or hydroelectric, considering the calculation perimeter defined in this annex.

The Domain GO Scheme may specify a default value for the GHG intensity of Energy Carriers from biomass to be applied if the cancelled GOs does not include a carbon footprint.

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