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 1.3
Identification of the main challenges which currently exist in the management of guarantee of origin systems

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1. Introduction

1. Framework

The FaStGO project provides expert advice to the European Commission DG ENER, based on the terms of Reference N° ENER/C1/2019-517: "Technical support for RES policy development & implementation. Establishing technical requirements and facilitating the standardisation process for guarantees of origin on basis of Dir (EU) 2018/2001."
Under task 1.3 the project identifies the main challenges that currently exist in the management of guarantee of origin systems.
Further in the project (FaStGO task 2) options and text proposals are drafted for the standard EN16325 on guarantees of origin. Some challenges mapped under this task 1.3 might find a solution in the update of this standard EN16325. The mapping of the system management challenges however doesn't limit itself to challenges that can be resolved in EN16325, as it aims to become an overview on the wider framework, which also enables a view on interrelations between various challenges. This should help to prevent that a solution to one particular challenge would cause problems in another area of the system.
The text proposals for a revised EN16325 that will be drafted later in this project, will be an input for the process in CEN/CENELEC for the revision of this standard on guarantees of origin.

2. What and why

Article 19 of the Renewable Energy Directive 2018/2001, (generally referred to as REDII) sets up a framework for guarantees of origin that builds on the provisions of the previous renewable energy directives (2009/28 and 2001/77). The term Guarantee of Origin (GO or GoO) is commonly used by electricity system operators and market participants.
The market for electricity GOs continues to grow, with generation that received a GO reaching 791 TWh in 2018. Power generation eligible for certification but not currently receiving it is consistently decreasing and had reduced to 176 TWh in 2018. Also in 2018, cancellations of GOs (the step required to prove ownership and use of a megawatt-hour of electricity) passed 700 TWh for the first time[1]. *Figures for 2019 will be added in the course of March 2020.*

This document addresses the current challenges facing the GO system and only briefly touches upon the many challenges that have already been overcome since GO systems were implemented in the past two decades. It takes for granted the basic solutions which have been elaborated for a general GO system architecture, but touches upon the challenges the system faces today.

[1] https://www.recs.org/cover-stories/go-monitoring-2018-report

Many of the initial challenges for setting up GO systems were described in the E-track[2], RE-DISS[3], CertifHy[4] and Biosurf[5] projects. Other challenges that have arisen as GO markets have grown were overcome by solutions developed by the members of the Association of Issuing Bodies[6], ErGAR[7] and CertifHy, to which this document will correspondingly refer. This document considers the changes that remain as of January 2020.

The set-up of this list of challenges comes as an introduction to the work on revising the EN16325 standard on Guarantees of Origin. However, in order to gain a full overview of the challenges in the management of GO systems and to bring into scope some interdependencies between them, this document also considers challenges that cannot be resolved by EN16325 alone.

3. Consultation

This document is distributed to experts who work in areas that are related with GOs for consultation. One expert doesn't necessarily comment to all sections in this document, but may select specific topics related to his area of expertise. Feedback is collected in the structure of the online questionnaire.

4. Glossary

GO	A guarantee of origin in the meaning of article 19 of REDII
IEM	Internal Electricity Market Directive nr 2009/72/EU and 2019/944/EU
REDII	the Renewable Energy Directive 2018/2001/EU
RES	Renewable energy sources
RFNBO	Renewable Fuel of Non-Biological Origin

[2] https://ec.europa.eu/energy/intelligent/projects/en/projects/e-track
[3] http://www.reliable-disclosure.org/
[4] https://www.certifhy.eu/
[5] http://www.biosurf.eu/en_GB/
[6] www.aib-net.org
[7] Www.ergar.org

2. Design of Guarantees of Origin

1. Prevention of fraud in production data registration and audit of production devices

Key to the credibility of a GO system is the **reliability of the data inscribed on the GO certificate itself.** Ensuring the reliability of this data requires a system that is well set up in the first instance, with accurate measurement infrastructure, secure data reporting systems, and transparent, accessible system information tools. Together, these requirements should assure delivery of the fundamental principle of a GO system – that one MWh of electricity production may receive one, and only one, reliable and accurate GO certificate that can be easily tracked by system operators as it is quickly and safely transferred between market participants.

When cases of misuse of the GO system do occur, such as a producer claiming to provide renewable power while feeding their production device with fossil fuel, they must be identified. When fraud is identified in a GO system, the legal procedures of the Member State can take corrective and punitive actions as appropriate. Identifying fraud requires clear and robust procedures.

a. The first layer of control is provided through clear procedures for production device registration, and/or the integration with other licencing and registration systems in the country (e.g. environmental licencing procedure, DSO/TSO registration in the grid access registry, …)
b. The second layer of control comes from the accurate work of the measurement body (See: Approved Measurement Body definition in EN16325 section 3).
c. The final layer of control comes from performing onsite inspections to check that the data provided in the earlier layers of control are not fraudulent. This includes both initial inspections of production devices at their time of registration, and ongoing "production inspections", that require checks on the correctness of submitted data against which GOs have been issued.

In order to keep costs manageable, any supervisory & inspection procedures should be set up efficiently and, where possible, integrated with existing inspection and verification procedures. A robust system for auditing production devices and production data can prevent fraud from happening, while also identifying any fraud that does take place. All operators of GO schemes are aware of the importance of inspections of production devices (PD), both through onsite verification and offsite documentation checks and integration with data from licencing authorities. The following experiences from different sectors can be taken into account.

Electricity:

Within the AIB, debates have taken place on how to balance the need for production audits and production device audits against the cost of such audits and the impact of this cost on overall GO system management costs. These debates revealed that the risks of fraud are different for different technologies and fuels, and in different countries. Therefore, the EECS Rules include guidance on how to secure the sought-for balance mentioned above.

For electricity, the rules allow issuing bodies to decide for themselves on the need for onsite inspections, while stating that such inspections are likely to be necessary in the case of electricity production from biomass. However, in other cases, inspections may not be necessary. For instance, take hydropower stations in the mountains: here, fraudulent production of non-renewable electricity is unlikely, while e.g. environmental

agencies have usually performed audits in licencing procedures and the meters are checked by the TSO/DSO, so there is not always a case for incurring audit costs, including significant the travel costs of reaching the plant. General requirements under the EECS Rules on production device inspections contain the list of elements that issuing bodies should check for accuracy against the registered data (EECS Rules art. E3.3.7, E3.3.11, E3.3.12 mention generic rules for all energy carriers. N5 is specifically for electricity)

The AIB has published Best Practice Recommendations for Production Device Inspections (https://www.aib-net.org/eecs/best-practice-recommendations). These recommendations include specifications on appointment and role of the inspector, and on the subjects to be covered in the inspection report (like energy flow diagram, including the location of meters involved in calculating the amount of GOs to be issued; brand, type, calibration certificate and seal date of all involved meters; confirmation of data in the GO application; …). One challenge is that in the past, such best practice recommendations were not enforceable across Europe as there was no higher authority requiring them to be followed. This has resulted in different practices in different countries on production device inspections. Unless EN16325 incorporates such best practice recommendations or at least requires compliance with their underlying principles, then the same challenge will persist.

Gas :

Gas generic:

Under the EECS gas scheme, production device inspections are mandatory (www.aib-net.org/eecs/eecr-rules). Other than this, the same principles on inspections apply for EECS gas scheme members as for EECS electricity mentioned above.

Biomethane:

ERGaR relies on natural gas TSOs and DSOs as its primary source of data on the injection of gas into the grid. In addition, ERGaR has a developed system of audits to ensure the credibility of the data used:

Initial audit:
All biogas and biomethane producing units must undergo initial audits in their home country to confirm that the units qualify as biomethane production facilities. Specified requirements on technical capability, equipment, processing potential of substrates and others are checked and verified by the auditor. The task of the initial audit is to document the technical capability and throughput capacity of the unit to produce biogas/biomethane. The information on the initial audit serves as a basis for registration as a production facility in the biomethane registry and such plant information is considered valid until technical adaptations are conducted in the production unit. In case of changes in technology, the audit must be repeated.

Production audit:
The composition and volume of the input material (for renewable gas – biomethane) production is reported by the producer, and no other information source is available for these data. The audit of the producers should be integrated into the GO scheme. The declarations by the producers are to be audited yearly. In case of reporting incorrect data, the already issued relevant GOs must be withdrawn and the issuance of GOs to the producer must be suspended.

Hydrogen:

CertifHy II elaborated a procedure for the audit of production devices, endorsed by the participants of the CertifHy II project. This is publicly available:

https://www.certifhy.eu/images/media/files/CertifHy_2_deliverables/CertifHy_P0.2_Registration-of-Production-Device_V1-0_2019-03-11_endorsed.pdf

Heating and Cooling

For heating and cooling, the risk for fraud by falsifying the energy source may be greater than for any other energy carrier. Renewable energy sources with which heat is produced can often easily be replaced with non-renewable fuels. Inspection systems must take this into account, including as regards the frequency with which they are carried out. Issuing GOs for heating and cooling is not yet widespread. As an example, the GO system for heating and cooling in Flanders requires bi-annual inspections of production devices for heating and cooling (note that in Flanders GOs are only issued to heating and cooling devices with a thermal capacity above or equal to 300kW), whereas in the Netherlands an annual report on the feedstocks is required, set up by an external accountant.

Questions for consultation

1. Do you feel an onsite production device inspection should be mandatory for
   - All production devices?
   - Production devices producing energy from biomass?
   - Specific technologies?

   Please provide your reasoning
2. What frequency of onsite inspection at the site of the production device is relevant for each energy carrier?
3. What level of detail do you feel is required at an onsite production device inspection?
4. Should there be European-wide harmonization on production device inspections and production data inspections, or should this be left to national legislation and discrepancy?
5. With regards to the Best Practice Recommendations for Production Device Inspections published here[8]:
   (1) Do you endorse these recommendations?
   (2) Do you have any comments with regards to these recommendations for inspections of electricity production devices?
   (3) While they are written for electricity, a lot of the text could apply for gas or heating and cooling. What concepts, apart from adapting the terminology for "electricity" to "gas" and "heating and cooling", would need to be added in order to provide recommendations on best practice for gas production device inspections?

[8] https://www.aib-net.org/eecs/best-practice-recommendations

2. Simplified information on GOs for small capacities

Challenge

REDII art. 19.7 specifies that *"Simplified information may be specified on GOs from installations of less than 50 kW".* If the definition of 'simplified information is not standardised between Member States, the import and export of such GOs could be hindered for technical reasons, creating a barrier for the international transfer of GOs from small installations. If GOs from installations of less than 50kW were harder to transfer internationally, they could be confined to their domestic markets, potentially reducing their price.

The type of production technology that is most frequently used in installations of less than 50 kW is currently solar photovoltaic devices. Depending on policy and market developments, the rollout of small devices could expand to other technologies.

Potential reasons for simplifying data on the GOs:

- To aggregate the issuing efforts for many small production devices, so that small producers are not put off by the effort of requesting GOs and a registrant can aggregate the application for issuance of GOs from a large number of devices;
- To avoid the administrative burden of too many sets of single certificate issuances per month;and
- To empower small producers to fully participate in renewable energy markets without facing the regulatory requirements placed on larger producers.

Example of parameters with simplified data on GOs issued for small devices

- Production period => a calendar year instead of 1 month;
- Identification of production device (name, ID, address) = postal code or province of the production device;
- The capacity of production device => category of capacities;
- Date operational => the year in which the production device became operational;
- …

Some parameters should not be simplified, either because of their value to consumers seeking to make conscious and informed choices about their energy consumption; or because they are needed to maintain system quality and avoid double counting. Parameters that should not be simplified:

- Energy source;
- Whether it relates to electricity, gas, heating or cooling;
- Type of installation;
- Date of issue;
- Country of issuance; and
- Unique identification number per certificate (in order to avoid double-counting).

A number of parameters could be left off single certificates from small installations, but included in a set of certificates with the same characteristics.

Potential solution

Include the reasons for simplifying data on GOs from small installations in CEN EN 16325, along with a specification of the data that GOs from small installations must include.

Questions for a survey to issuing bodies

a) Does simplifying the data on GOs from small installations (below 50 kW) assist the administration of your GO system as a whole? Please provide your reasoning and the likely benefits of doing so.
b) Which data fields would you simplify? How and why?

3. Facilitate an EU wide Green Label and/or a premium market for renewable energy

REDII Art. 19.13 requires the European Commission to *"present a report assessing options to establish an EU-wide green label with a view to promoting the use of renewable energy coming from new installations".*

In some countries, GOs are already used in combination with a label indicating that extra criteria have been met. One of these criteria is whether the buying of this GO contributes to additional renewable energy production (generally referred to as "additionality"), although actually unambiguously defining what is meant by additionality is not simple. EECS GOs, therefore, provide a data field that allows the providers of a label to demonstrate compliance with their criteria for the corresponding MWh.

Whether the above process could also work for any eventual EU-wide green label, or whether the proposals from the abovementioned assessment will require a change in the data architecture of GOs, is to be clarified.

Challenges on the GO operator side

1. Bring the role of any eventual EU-wide green label into the scope of CEN EN 16325, in order to
2. Define any extra data to be collected during production device registration and issuing of GO. This could possibly include aspects like:
    a. The mode of operation of plants or
    b. The grid situation of plants as it relates to the point of consumption, cf. REDII recital (90) on additionality of RFNBOs and
    c. The relationship between plant and consumer (this might be of higher relevance for GOs for heating and cooling as there is no pan-European heat grid) ;
3. Find a way to provide additional information to markets (and regulator/public institutions/…), either by having extra information on GOs or by providing transparent plant-specific data (in a production device database) as an official reference for additional criteria;
4. Determine whether extra data should be mentioned on the GO, and what data this should include;
5. work with the eventual operators of any EU-wide green label through the GO issuing process;
6. Ensure that the conversion between different energy types can be reflected by GO systems in such a way that relevant (e.g. additionality) aspects are being sufficiently documented.

Challenges for producers and traders

1. The difference in market value for GOs with and without any eventual EU-green label;
2. Properly understanding the magnitude of this difference (unless there is a push on issuing bodies to collect and publish GO transfer prices); or
3. The interaction between GO markets for "standard" renewable energy trading and regulation-driven markets (cf. RED2 recital 90 on RFNBOs).

Questions for consultation

What extra data should be added to the GO, on top of the requirements by art. 19.7 of REDII, for adding value for consumers?
How will this benefit the consumer?

Will extra data on the GO actually make any difference to the amount of new build RES production, and how can you substantiate this?

4. Storage – conversion – onsite consumption

Challenge: simplifying complexity and clarifying ambiguity

How to manage the certification of energy that goes through a storage device is a matter that is frequently debated by GO system operators and market participants. For example, should an energy storage device be considered as a conversion device? Should energy that enters a storage device have its GO cancelled? Should energy that comes from a storage device have a GO issued, and if so, for what generation technology?

In general, the question is how to manage GO issuance and cancellation when the energy passes through a storage device? Can the same principles that apply to energy that does not go through storage apply to energy that does?

Proposed solution

A storage operator should function as any other energy supplier without their own source of generation. If they which to supply a particular energy product they need to procure the related GOs and either transfer them to the consumer for cancellation or cancel them on the consumer's behalf.

Two principles, both following from the phrasing in REDII art.1, together simplify the issue:

1) Only the cancellation of a GO determines whether consumed (or lost) energy is renewable.
2) Tradeable GOs can only be issued for energy that is placed on the market (see also challenge 13 Onsite consumption)

This results in the following guidelines:

Storage losses:

1. If produced renewable energy is stored 'behind the meter', before being placed on the grid => only issue GOs for the energy placed on the grid and made available to the market.

2. If energy is stored after being placed on the grid and made available to the market, the energy is no longer connected to the GO and =>

    a. the storage provider can freely decide to "green" storage losses by cancelling the amount of GOs equal to the amount of energy lost in storage. If the provider doesn't cancel GOs, the storage losses are considered to be non-renewable energy consumption.
    b. The storage provider doesn't HAVE TO cancel GOs and doesn't have to "green" their losses.

A storage operator is not consuming energy, just holding energy and causing some losses. The same goes for a distribution or transmission system operator: energy losses during distribution are considered as a type of consumption. The origin of this energy loss-consumption can be claimed as coming from RES, on condition that GOs are cancelled.

Energy Carrier Conversion:

Cancel GOs for the amount of input in an energy carrier conversion device, corresponding the measured energy input;

Issue GOs for measured output of the conversion device.
See also section 7 on Energy Carrier Conversion rules.

Onsite consumption
Proposed solution:
Stick to basic principles: Tradeable energy production from RES should receive tradeable GOs. In line with the general principles, the condition is that this doesn't cause double consumption of the same renewable attributes.

Questions for consultation
1) Do you endorse the principle that "Only the cancellation of a GO determines whether consumed (or lost) energy is renewable."

   Y/N/partly/don't know . Please provide your reasoning

2) Do you endorse the principle that "Tradeable GOs can only be issued for energy that is placed on the market"

   Y/N/partly/don't know. Please provide your reasoning

5. Determining the attributes of energy from production devices with multiple inputs and/or multiple outputs

Challenge

While hydrogen is the energy carrier for which production from multiple energy inputs and/or co-production with other outputs is the most common, such a configuration is also encountered with the other energy carriers.

For instance

- Production of hydrogen by the plasma gasification of biomass involves two energy inputs: biomass and electricity
- In a klor-alkali process, hydrogen is co-produced with Chlorine and caustic soda
- The situation also occurs in the case of co-generation of power and heat by co-firing biomass with fossil energy
- Biomethane produced from biomass and heat falls in this case as well

Rules need to be defined for determining the amount of renewable energy produced by such processes when energy of renewable origin is used as an input. How the greenhouse gas intensity of the energy products is determined must also be defined.

Hydrogen

In CertifHy, the adopted approach for determining the amount of renewable product from a process using multiple energy sources is to consider that the share of renewables in the output(s) is simply the share of renewable energy in all the energy inputs taken together, on an energy basis. No difference is made between energy inputs in the form of an energy carrier, and energy inputs in the form of a feedstock - only energy content is considered.

Heating and Cooling

This question also arises when certifying energy sources for heating and cooling.
A general principle in heating and cooling with heat pump technology is that the energy source is the heating or cooling from the environment. Any energy (usually electricity) consumed by the heat pump, would be considered as auxiliary energy to the heating or cooling production. However, all energy inputs to the conversion process could be considered as well, in this case, both ambient heat and electricity, following the approach adopted by CertifHy.

Gas – Synthetic methane:

Synthetic methane is produced by Methanation: 2 H2+CO2 => CH4 +O2.
For synthetic methane to be considered biogas in accordance with RED II, both the hydrogen and the CO2 need to be of biological origin.

For synthetic methane to be considered a Renewable Transport Fuels of Non-Biological Origin (RFNBO), REDII requires only the energy content to be of renewable origin, i.e. the CO2 can be from any source.

Gas – biomethane

Renewable gas from biodigestion is produced through a chemical process, of which the input material is considered to be the energy source of biological origin. However, if a significant amount of heat or electricity for the reaction is brought from another source, or generated using gas or electricity, then the origin of that input should be considered as well.

Gas -generic

Under EECS, Multi-energy input is covered by EECS Rules section O6.3.2 and O6.4 for gas certificates.

Electricity

Co-generation of electricity and heat from e.g. coal and biomass is a relevant case of multi-energy input and output. Under EECS,

1. Multi-energy input is covered by EECS Rules section N 6.3.2 for electricity certificates.
2. High efficient cogeneration of electricity and heat is considered a specific type of guarantee of origin, related to the technology of production, instead of to the energy source, where the "useful heat" in the output is subject to strict criteria under the Energy Efficiency directive 2012/72/EU.

Questions for consultation

- How does your Member State deal with production devices with multiple inputs and multiple outputs?
- How would you advise allocating the origin of multiple outputs on the GO to the multiple inputs?
- Do you see the needs properly addressed in the practices mentioned in this sections? Y/N/partly/don't know
  If relevant, please provide the argument for your reasoning.

6. Categorising different types of gases in the design of GO systems

GO schemes are in operation for electricity and gas, and more recently, for hydrogen on a pilot basis.

Up to now, only GOs for electricity (and heating and cooling, albeit on a voluntary basis) were covered by the regulatory framework through REDI, while REDII (article 19) requires GOs to be used to guarantee the origin of all energy from renewable sources.

Furthermore, the REDII mentions in article 19.7, that the guarantee of origin shall specify *whether it relates to*

1) *Electricity;*
2) *Gas, including hydrogen; or*
3) *Heating or cooling.*

Note: Renewable energy can also be delivered through a liquid energy carrier, and gases are also traded in liquified form.

GO systems for different energy carriers have a lot in common: Indeed, in order to achieve their purpose, they all need to incorporate measures for:

- the avoidance of double counting;
- reliable data registration;
- designing procedures and allocating roles for measuring, auditing, registering, issuing, supervising transfer and cancellation; and
- supervising disclosure and expiry.

However, the GOs for the different energy carriers need to be clearly distinguished for three reasons:

1) Each energy carrier has a distinct use in the energy system, with distinct applications for the end consumers. Therefore, it must be ensured that GOs are only used to make a claim on the type of energy carrier for which they were issued. e.g. an Electricity GO must only be used to make a claim on the use of electricity; a renewable Gas GO must not be used to make a claim on the use of Hydrogen, etc.

2) The energy systems associated with each energy carrier have inherent technical differences, e.g. regarding:

- the definition of the energy distribution system across which GOs can be applied:
    - Electricity: EU electricity transmission and distribution systems, closed distribution systems, private grids and direct lines.
    - Gas: National gas transmission and distribution networks, as well as bulk distribution;
    - Hydrogen: Pipelines and bulk delivery systems
- the definition of the energy products across which GOs can be applied:
    - Electricity: GOs are applicable to the consumption of electricity in any form,
    - Gas: there are specific rules regarding the application of GOs across various gas products (natural gas, propane, butane) and forms of delivery (grid and bulk),
    - Hydrogen: while there are different product qualities, GOs can be applied across all volumes of hydrogen meeting the purity specification specified by the GO scheme (99,9%),

- Energy carrier production configurations and the amount of renewable energy produced by a production device
    - The production processes for Hydrogen are more diverse than those for electricity or renewable gas production, requiring robust approaches capable of handling all configurations (see CertifHy)
- Means of measurements and the applicable requirements are specific to each energy carrier
    - For Hydrogen, there are specific practices for determining the quantities produced and delivered
- The way cross-border exchanges are handled
    - Hydrogen GOs are already applied across borders over cross-border logistical systems (Benelux)

3) the applicable regulatory framework and market characteristics of each energy carrier differ as well:

- Electricity transport and distribution is subject to national regulation – harmonised through the European directive on the internal electricity market (2019/944). There are strict requirements on Member States to ensure the unbundling of roles and responsibilities on the supply of electricity and the operation of power grids. Heating and cooling are either consumed immediately at the place of production or are transported through a liquid material flowing through pipes. European legislation from directive 2018/2012 provides for a level of harmonisation here.
- Gas from renewable energy sources that is distributed over the natural gas network falls under strict regulations, through the European Gas Directive 2009/73. As with electricity, there are strict rules on unbundling between the roles of supply and grid operation. Gas from the natural gas grid is widely used in combustion applications (heating, engines, turbines, …), but also has applications in chemical industry processes.
- Methane, propane, butane, mixtures of gases, … can be transported in bulk. Regulations are not coming close to those from the European Directives for the internal markets for electricity and (natural) gas. Demand for GOs for gases transported in bulk has not yet revealed itself. However, liquified biomethane is established in a physical supply chain in some countries (e.g. Italy).
- Hydrogen is not regulated to the same extent as electricity and gas. There are currently no EU rules on the unbundling of roles on supply and distribution.

It is, therefore, clear that in addition to general rules that can be applied to all GOs, there will also need to be separate sets of specific arrangements for electricity, gas, hydrogen, and heating and cooling.

In particular, while (hydrocarbon) Gas and Hydrogen have in common that they are both gaseous energy forms, the analysis above shows that GOs for Gas and Hydrogen have the same reasons to be distinguished as GOs for Gas and Electricity:

1) The two forms of energy have distinct uses in the overall energy system They consist of a different product with a different value for end-users. For Gas, the exact chemical composition is not as relevant as for hydrogen, between a certain range of boundaries, as it is mostly used for combustion applications that convert into heating or mechanical energy. Hydrogen applications relate to its unique chemical composition.
2) They are associated with distinct energy sub-systems subject to different technical requirements and practices
3) They are covered by distinct regulatory frameworks.

Options for a basic structure of EN16325:

Based on the above reasoning, a section on generic requirements for GO systems will define and layout all the aspects that need to be addressed. Where there are differences between the four energy carriers, these will each be covered individually in a separate section dedicated to these differences.

For the gaseous energy carriers, however, there are differences of opinion concerning whether or not to further categorize the different types of gas into separate rule-sets.

Markets for methane and for hydrogen, being the main gases for discussion here, are essentially different. The different characteristics, in terms of use, market dynamics, means of supply and regulation, need to be considered in the design of a GO system for gas.
This brings up a few questions for GO systems design with regards to the description of roles, rules for measurement and inspection, and GO market development in relation to the physical gas market for each type of gas. Taking into account the abovementioned different characteristics, this comes down to a few options for the gas GO system(s):

1) Consider all gases using the same terminology and set of rules. Describe those in such a way that they are applicable for all types of gases and foresee room for differentiating different types of gases where the market requires it. While this enables the aggregation of roles related to different types of gases and correlated efficiency gains, it also acknowledges that there might continue to be distinct discussion fora for gas GO issuing bodies and gas GO traders using the same set of rules.
2) Design a separate set of rules for GOs of different types of gases. Enable essential differences between gas types to result in differently formulated rules for the different GO systems. Acknowledge that this might stimulate separately managed GO systems and might lead to higher system management costs from an overall viewpoint.
3) Other?

GOs bring the physical differences between methane and hydrogen markets to an abstract level. While physical markets may differ greatly per energy carrier, GO markets may differ less. While measurement requirements and expert discussion fora will probably be set up per physical energy carrier, it has yet to be decided whether GO standard texts need different phrasing for different types of gases. A question here is whether the management of hydrogen GOs, methane GOs and GOs for other gases requires, per definition, the additional overhead cost of setting up separately managed systems. System management cost needs to be balanced against the need for differentiation.

The proposal is to structure EN16325 on the following basic framework:

Chapter 1.Introduction
Chapter 2.Framework and scope
Chapter 3.Generic rules for guarantees of origin (Generic for all GOs)
Incl.rules for energy carrier conversion
Chapter 4.Energy carrier-specific rules
1.Electricity
2.Gaseous hydrocarbons
3.Hydrogen

4.Heating and Cooling

Questions for consultation

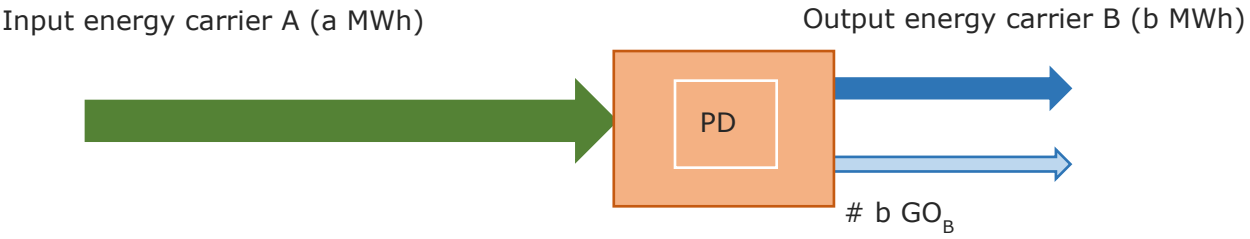
Does this proposed structure work from your point of view?
Y/N/I don't care.
Why / why not?

7. Energy Carrier conversion: Rules for GO issuing related to energy carrier conversion

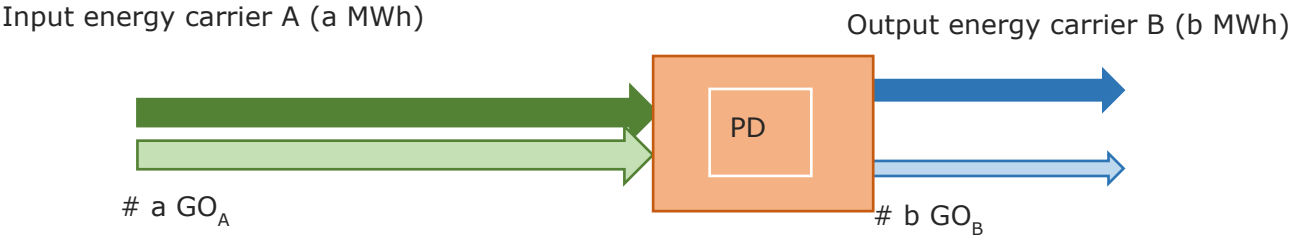
Challenge

Energy carrier conversion is the production of an energy carrier (e.g. hydrogen) from another energy carrier (e.g. electricity). Of all system management challenges, energy carrier conversion is the one pushed most by the REDII implementation deadline. It requires GO systems of different energy carriers to synchronise.

In order to allow claims of producers related to the origin of the resulting energy carrier, it requires the issuance of GOs, which can only be facilitated if an appropriate amount of GOs for the original energy carrier is cancelled. Also, this must be related to the physical conversion of the energy carrier. Rules are needed for handling GOs for multiple energy carriers, in relation to physical energy carrier conversion.



In an energy market where GOs exist for only one energy carrier B, the issuing of GO_B of energy carrier B (e.g. Electricity) is a logical process, relating to the energy source of the input energy carrier A (e.g. biogas)
When GOs exist for multiple energy carriers (A, B, …), a producer may also want to use GOs to prove the renewable origin of input energy carrier A (e.g. biomethane) which produces energy carriers B (e.g. electricity):



Here, it is essential to adopt a clear framework for governing this process (in order to prevent double-counting, misunderstanding, double perception, lack of trust,…).

Affected areas of GO system operation

Issuing of GOs, cancellation of GOs, conversion of energy carriers.

Potential directions for solving the matter

A set of basic consistent principles could be the following:

1) GOs are only issued for a physical energy carrier that is physically being generated.
2) GOs are only issued for the energy carrier that is mentioned on the GO.
3) The amount of energy input to the production device is measured, (or is determined by dividing the measured amount of output by the energetic efficiency of the production device PD.)

   The amount of GO_B to be issued as a result of the energy carrier conversion is hence not equal to the amount of cancelled GO_A that proved the origin of the energy input to the energy carrier conversion.

4) An amount of GO_B is issued for the amount of measured net output of energy carrier B.
5) Rules for recording data on the newly issued GO_B need to be harmonised.
    a. As a basic implementation of GOs in the meaning of REDII art.19, there is no need for maintaining data from the full supply chain before the creation of energy carrier B. This would lead to the following guideline as a minimum requirement for sourcing the data to be recorded on GO_B:
        i. From GO_A :
            1. the energy source
            2. (in case the GO would be embedded in a bigger certificate😊 the purpose (= disclosure)
        ii. Cumulated from PD + GO_A: information related to the support received for the production or investment
        iii. From the converting production device "PD": the rest of the data fields on GO_B
        Of these data, the production period is the one that leaves the most room for discussion, as some might advocate that this lengthens the validity period of the claims that can be made with the original RES production.

(the EECS Rules nrs C3.2.2, C3.2.3, C3.5.6 facilitate the above-proposed rules)

    b. Depending on the degree of interlinking the requirements of REDII art. 19 GOs with the REDII art. 25-31 sustainability certificates, there may be a case for linking also the full data set of GO_A to GO_B. There are several ways to establish this.
        i. Copying all the data fields of GO_A on GO_B.
        ii. Provide 1 data field on GO_B that links to GO_A. This way all the information related to GO_A is accessible. While this is in terms of GO data structure the easiest solution, it calls for a thorough consideration on the pan-European IT systems architecture as described under challenge 20. Indeed, in the architecture of a GO registry per country, after export, the data behind the link to GO_A may no longer be available to the importing system operator.

(the EECS Rules nrs C3.5.7 and C3.5.8 initiate facilitating this addition)

Further challenges in the rules for energy carrier conversion

Matching data formats of GOs from different scheme providers. (as elaborated in challenge nr 22)

Consultation towards issuing bodies

1. Do you endorse the above proposals?
    i. Y/N/don't know yet/don't understand the problem/don't understand the proposed solution.
    ii. Please provide your reasoning (if relevant).
2. Do you have experience with similar methods? What are the experiences of the strengths and weaknesses of the method?
3. Have other methods for handling GOs in relation to energy carrier conversion yet been applied somewhere? Where do they differ?

8. Avoiding double counting following from the interplay of GOs (REDII art.19) and sustainability certificates (REDII art.25-31)

Legislative reference

The Renewable Energy Directive 2018-2001-EU (REDII) addresses two separate aspects of tracking the origin of energy: guarantees of origin (art.19), and sustainability certificates (art. 3.1 and 7.1, 25-31), which will be recorded in an EU Database (art.28.2).
The scope of the GO system under article 19 states: GOs are for demonstrating to end-users the origin of the energy they are consuming. On the other hand, sustainability certificates used for fuel target compliance are created in line with art. 25-31.

In essence, GOs (under Article 19) shall have no function in terms of a Member State's compliance with renewable energy targets. On the other hand, certificates created in line with Articles 27-30 enable counting the respective volumes towards meeting the respective targets in case of transport fuels.

From common logic this should also work the other way around: sustainability certificates should not be used for renewable energy consumption claims. It is, however, difficult to prevent this from happening in reality.

Double counting risk

A link between the management of the two types of certificates (GOs and sustainability certificates) must be established in order to ensure that double counting is avoided. If not, a risk exists that the party who consumes (cancels) the sustainability certificate, claims the consumption of the renewable origin of the corresponding energy. In case for the same amount of energy from RES, a GO had been issued and traded separately, the same MWh of renewable energy production is claimed twice.

Options for interlinking GOs (origin disclosure purpose) and Sustainability certificates (target counting purpose)

This can be done in several ways:

1. by excluding the issuance of one when the other is granted;
   (This implies that, in order to exclude double disclosure for renewable gas volumes which are placed on the market as biofuel for transport, the rules and regulations of the national issuing bodies contain the provision that no GOs are issued to the producer for those volumes which are supplied to transport) This, however, precludes in principle the end-user from being informed about the origin of that product, as GOs must be used for this; or
2. by clearly communicating that the sustainability certificate does not encompass any claim of the origin of the consumed batch
   (although it is difficult to control what claims suppliers and consumers are making, especially when there are no harmonised prescriptions for disclosure of the origin of supplied gases); or
3. by bringing the two purposes together on a single certificate so that both stay together for the whole of their lifetime.

Member states can opt to implement any of these different ways, and they need to choose what works for their system, as long as it ensures the avoidance of double counting and double disclosure of the same unit of energy from RES, and does not create barriers for cross-border trade between EU Member States.

The last option (3) seems to provide the greatest value (both in the market value of the certificates and reassuring the avoidance of double claims of the same quantity of renewable energy). Such an option requires both functions to be delivered by a single "electronic document" that meets the requirements of both art. 19 and of art. 29-30 of the REDII, and will hence have 2 separate functions, which stay together until their final use.

Both certificates, however, are issued under different approaches: GOs under Article 19 are issued on the „book and claim" basis, sustainability certificates under Articles 27-30 are issued in accordance with the mass-balancing methodology. For those energy carriers and those production devices where an umbrella "energy certificate" would be issued, both methodologies' characteristics need to be incorporated.

Considerations with regards to a "multifunctional - single certificate" approach

Several questions are to be considered where considering the **joint management in a single "energy certificate" of a GO (origin disclosure purpose) and a sustainability certificate (target compliance purpose)**:

a) Many interpretations of the concept of mass balancing exist. Here it is essential to establish an understanding of, and ideally resolve, any differences between the concepts of mass balancing as understood by different organisations, in order to achieve a common definition and understanding.
b) The data content of a certificate in a possible single-certificate system. Efficiency can be gained from collecting data in a single process together for both purposes (origin disclosure to consumers and transport fuel target compliance).
c) How the cross border transfer of such certificates interacts with a required share of renewables in transport fuels and its correct handling target-wise.
d) The end-use of the energy to which the certificate corresponds needs to be handled.
e) The requirement for sustainability is to demonstrate specified GHG emission savings as compared to the relevant fossil fuel equivalent. The thresholds for different end-use applications are different and are fixed in REDII.

Technical option for a single certificate solution

Because different sustainability criteria are relevant to different categories of consumption these criteria cannot be fulfilled independently from the usage.
Hence the issuing procedure of the GOs must be adapted in either of the following ways:

- Issuance in line with the same procedures as the mass balancing certificates, meaning no issuance until the end-use is known.
- At the time of GO issuance: Predetermine on the GO the allowed category of end-use, and install a supervision mechanism to this.

Further it must be noted that there will be RES production that is eligible for only 1 of the purposes (origin disclosure OR target counting), hence the certificate system must account for this.

Questions for consultation

How would you resolve the double-counting risk for energy carriers that can be used for transport?
Which of the above "options for interlinking" would you propose (1/2/3)? Why?
Would you see other/better options?

9. Using the data on the GO for purposes wider than origin disclosure - EU-ETS

Several organisations are discussing the use of the data on the GO for other purposes. Consumers might use the data on the GO for proper accounting of the combusted bioenergy under the EU-ETS. It follows from internationally recognised standards and EU law that biomass and energy produced from biomass shall have a 'zero-emission' rate[9] . In addition, in practice, GOs are also used for Greenhouse Gas Protocol scope II[10] accounting.
This would increase the market value of the GO certificate, providing producers with an income stream that could go some way to offsetting the reduction of direct support schemes.
It needs further consideration whether additional conditions need to be met, both for reliable origin disclosure and for consistent clean energy support policies.

While the sole use of the GO is to prove to the final customer the origin of energy production, it may be that the customer uses their proof of renewable energy consumption for further purposes and benefits they can derive from their renewable energy consumption.

In general, the process that leads to the issuing of the GO and disclosure of energy use will also generate and provide data that can be used for other purposes. It would be inefficient to organise this same data collection & verification process multiple times for different purposes. In addition, if the GO is used for claimants under other systems than disclosing the origin of the supplied energy, it is worth investigating whether to include these different types of use in the system design.

The GO system management risks of not doing so are twofold:
1) missing out on efficiency opportunities in the data capture and recording process and thereby adding to the GO system an overhead cost that is too big for the market to carry.
2) doublecounting of the same quantity of energy from renewable sources. Claimants could be mixing up the purposes of different types of certificates.Using GOs for EU-ETS?

Article 5.2 "Biogas in natural gas grids" in the EU ETS MRR Guidance document No. 3, Updated Version of 27 November 2017 contains:

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[9] In the European Union, emissions from biomass combustion are currently accounted for as zero pursuant to Article 38 of Commission Regulation (EU) No 601/2012 .
This principle has been confirmed also in the recently approved european LULUCF regulation. (REGULATION (EU) 2018/841 ,Whereas 15.
So the **"zero rating principle**" for biomass is widely recognized in the EU legislation.
More precisely in:

Directive 87/2003 establishing the ETS
MMR regulation 601/2012
Biomass issue MMR guideline document n.3
REGULATION (EU) 2018/841 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry

[10] https://ghgprotocol.org/sites/default/files/ghgp/standards/Scope%202%20Guidance_Final_0.pdf

„If Member States want to make use of biogas in a natural gas grid and want to make the benefits thereof easily accessible to operators of EU ETS installations, they need to establish an appropriate accounting and verification system (e.g. using a biogas registry) which allows the accurate, transparent and verifiable identification of biogas amounts fed into the grid and consumed by installations, effectively avoiding double-counting of biomass. The system also needs to make provisions for avoiding data gaps or double counting if the grid is connected to other grids, including in other Member States."

Challenges when using GOs for purposes of EU-ETS are:

- Avoiding double counting: Making sure that when a GO is used as proof for EU-ETS, no other method is used;
- Linking supervision bodies of EU-ETS with GO Issuing bodies;
- Impact on national RES policy purposes: There is a clear difference between an EU-wide scheme such as the ETS and national support schemes which reward for RES through e.g. tax-cuts. Having national incentives based on internationally tradable certificates needs to be carefully scoped in order to avoid undesired consequences in national policy frameworks.
- …

Questions for consultation

1. What benefits do you see in using the GOs as proof of renewable energy consumption claims under EU-ETS?
2. What risks do you see in using the GOs as proof of renewable energy consumption claims under EU-ETS?
3. What measures could be taken in order to overcome these risks?
4. How would you see the ideal interaction between organisations performing the role of establishing the "appropriate accounting and verification system" and those performing the role of renewable gas GO issuing under Article 19. of REDII?"
5. If GOs can be used as proof for the 'zero emission rate' of biomass in the EU-ETS, what data is required to be recorded on the GO?
6. Were the EU-ETS to be revised in order to support the above, how substantial do you think such modifications would be?

10. Data to be recorded on the GOs: what information is relevant for consumers

Apart from the data fields mentioned in REDII Art. 19.7, there can be reasons for consumers to make selective choices in the details on their energy origin. They, however, can only do so if the GO provides information on the variable that stimulates their choice.
A minimum level of transparency on details can make a difference in the public acceptance of the GO system.

This demands from the GO system design an understanding of what type of information has value for consumers. More specifically: What data fields are relevant to be mentioned on GOs for the users of the GOs?
Such information could be optional or mandatory, depending on the desirability in the market, but in either case, the format should be standardised in order to facilitate efficient and reliable cross border transfers.

See also sections 3 and 13 on: 'EU-wide label' and 'onsite consumption'.

Suggestions

Generic on all GOs

- Whether or not the corresponding energy was disposed of on the market
- Optional information:
    - Greenhouse gas emissions produced
    - Whether or not sustainability criteria of REDII are fulfilled, and a reference to the report and identity of the auditing body
    - Intended category of use of the corresponding energy

Electricity

- whether fed into a distribution system, transmission system or closed distribution system

Gas

- Whether or not the corresponding energy was injected into an isolated system or a system that is interconnected with other countries in Europe.
- type of gas (chemical composition: methane, hydrogen, other gas)
- means of supply (injected into the grid, road transport, rail transport, ship transport, …)
- calorific value
    - as the GO is always representing 1 MWh this might not strictly be needed, however for a gas with a very low calorific value, this might have some relevance for credibility by the consumer

Heating and cooling

- Whether or not injected into a network for heating and cooling;
- chemical composition of the heat carrier
- aggregation state of the heat carrier
- temperature range of the heating or cooling from … till … °C (high-temperature heat has higher enthalpy, meaning a higher quality of heat)
- pressure range from … till…

Questions for consultation:

- Which of the abovementioned data fields have value for consumers in your opinion? (tick boxes)
- Which additional data fields would you add to the GO? Why?
- Where do consumers differentiate / what do they need in order to trust the GOs and to select the characteristics of the GOs they want to cover their energy consumption?

11.GO Validity

Challenges with current 12 months GO lifetime: reduced market value for GOs issued close to expiry

The directive 2009/28/EC limits the GO lifetime to 12 months from production: "Any use of a guarantee of origin shall take place within 12 months of production of the corresponding energy unit. A guarantee of origin shall be cancelled once it has been used."
In practice, this has been implemented with some variation between Member States, so that a GO expires 12 months after the end of the respective production period of the underlying physical energy. As the main use of GOs is for electricity disclosure within a calendar year, electricity suppliers have had to make at least 2 GO cancellations for a certain year, in order to avoid expiry of their GOs. Typically, the first cancellation is done before the year-end, to avoid the expiry of GOs issued for the beginning of the year production, and second before the deadline, which is typically the end of March the following year.

The strict 12 months expiry rule has forced marketplaces to define their GO products so that one year's production is divided into at least 2 separate categories of GOs with different market values, thus hampering the liquidity of the market.
Moreover, as the typical implementation of the disclosure regulation is such that for a given year X, only GOs issued for production during the same calendar year are accepted for supplier's disclosure reporting, the factual lifetime of GOs issued for the beginning of the year is longer than those issued for the last months of the year. This has also been reflected in the market prices of the corresponding GOs.

Another challenge is that sometimes administrative processes for issuing GOs take a significant amount of time. This can be the occasion of the first issuance which only takes place after a sometimes heavy administrative application process including files and inspection reports which might take months to be completed. It can also happen if an erroneous meter reading is spotted, resulting in the suspension of any GO issuance until the meter is replaced, re-inspected and the administrative tasks of both the producer and the issuing body are finalised to a satisfactory level in order to record the correct amount of GOs to be issued for the energy produced during the suspension. When a GO is issued many months after the production period, the tradeable period is significantly reduced, and with it, the price at which a producer can sell their GOs.

Challenges with the directive EU 2018/2001 12+6 months lifetime: multi-interpretability

In art.19.3 of REDII, the maximum lifetime of GOs was extended to 18 months: "*For the purposes of art 19.1 Guarantees of origin shall be valid for 12 months after the production of the relevant energy unit. Member States shall ensure that all guarantees of origin that have not been cancelled expire at the latest 18 months after the production of the energy unit. Member States shall include expired guarantees of origin in the calculation of their residual energy mix*."

- There is a tendency to interpret the 12-month validity in a way that a GO can be used for consumption periods ending 12 months after the end of the production period of the energy for which it was issued.
- It is not clear what would happen between the end of the validity period and before expiry when those are not on the same date.
    - Could the GOs still be transferred or would they be locked to account holders' accounts?

- Could the GOs still be cancelled?

  Note: In some countries, the existence of a GO on an account on the annual disclosure reporting deadline for electricity suppliers, is considered to be a cancellation (e.g. Spain). In most other countries an explicit cancellation action must take place.

- Timing of Residual Mix calculation could be jeopardised depending on the definition of the period during which cancellation is allowed and during which expiry can be determined. While double-counting must be avoided in the residual mix, in either interpretation, it is not recommended to postpone the residual mix calculation timing by 6 months, as that would cause suppliers' origin disclosures to relate to a period too far in the past. When a suppliers origin disclosure on their invoice relates to a period almost 2 years ago, some customers will question its relevance and even its credibility.

Interpretative option for solving the matter

The following principles are propsosed for a harmonised interpretation of the concepts of validity and expiry of GOs in relation with REDII art. 19.3.

Validity relates to consumption period to which the GO cancellation relates.

1. GO is valid for 12 months means: a GO can be used for consumption periods ending 12 months after the end of the production period of the energy for which it was issued

Expiry relates to the period during which GO transfer and cancellation can take place.

2. A GO can be traded and cancelled during a period of maximum 18 months after the production period of the GO.

Consistency measures are needed to reassure that a GO taken into account for a specific consumption year, is not already taken into account as "expired" in the residual mix.
Whether it is beneficial to enable transfer and cancellation for a longer time than the validity, is just the question.

Final cancellation date in relation to the preceding consumption year

The Risk here is that at the time of residual mix cancellation, it is not yet determined whether a GO issued for production in year X, will either:

a) Be cancelled for a targeted consumers consumption in year X, or
b) Be cancelled for consumption in year X+1, or
c) will expire and be absorbed into the residual mix.

This causes double counting risk, unless

a) the residual mix calculation is postponed, which is not recommended because of the impact on relevance and credibility.
b) An end date is set for the period during which cancellations are allowed for a disclosure year (= consumption year).

3. In addition to a rolling 12 month validity period for the consumption to which GO cancellation can be allocated, hence also an annual fixed end date is needed until when cancellations are allowed for a preceding consumption year.

In line with the RE-DIS[11] recommendations, it is advisable to set such end date for cancellations at 31st of March of the year following the year of consumption.

Questions for consultation

- Do you agree with the abovementioned interpretative proposal? (see text in the 3 boxes)
- What do you believe can be done with a GO during the period of its validity?
- What, in your view, can be done with a GO during the period between the end of its validity and its expiry?
- Would you prefer the expiry to stay at 12 months (as is under 2009/28/EU), given the negative impacs mentioned? Y/N/ I don't care/other.
  - In such case, how would you interpret directive 2018/2001 note on expiry after 18 months?
- In your view, for the most meaningful origin disclosure system, what should be the disclosure period (= period of consumption to which the GO cancellation relates)?

  The calendar year of the consumption for which the GO is cancelled
  The calendar year of production of the energy for which the GO was issued
  Rolling 12 months
  Calendar month
  Something else, what?
  Please provide the argument for your reasoning.

- Considering the Directive 2018/2001 formulation on GO validity, would you consider GOs be valid when they are cancelled for proving the origin of the energy that is supplied during:
  - the calendar year during which production took place?
  - 12 months after the end of the production period
  - The year of cancellation or previous year, honouring cancellation deadlines and the certificate expiry rule
  - To either calendar year which overlaps with the 12 months validity period
  - Something else, what?

[11] www.reliabledisclosure.org "Best Practice Recommendations"

3. GO Market

12.Prevention of double disclosure of the origin of sold energy

Challenge

To maintain (public) trust that where a GO is issued that the GO solely represents the right to supply the attributes to which the GO relates. When such trust is lost, whether through double issuing, double counting or even the perception that either might occur, the 'raison d'être' of the GO system vanishes.

Affected Areas of GO system operation

Registration, issuing, transfer, cancellation, consumer claims

Directions for solving the matter

Double issuance

Controls must be maintained that prevent the issuance of more than one GO for the same unit of produced energy.

Double transfer

The registration of ownership of a GO as an electronic document must be supervised by a designated competent body. The same applies to facilitating and supervising the transfer of ownership of a GO. It is essential to set up reliable IT systems and data protocols for cross-border trade to avoid GOs being (accidentally or intentionally) copied during the transfer of ownership. Therefore a GO must be kept in the registry of a trusted competent body at all times, and it can no longer be a GO with the same quality guarantees when it no longer resides in such a registry.

Double cancellation

Controls must be maintained that ensure that GOs can be cancelled only once, and only if they had not already expired or been withdrawn.

Double disclosure

Rules and controls must be maintained and/or introduced that:

- secure that a claim on energy delivered from a system that is within the scope of a GO scheme can only be made through GO cancellation;
- exclusively limit the means by which a claim can be made about the origin of energy (GO cancellation, tracking of supported energy, residual mix), to prevent the same unit of energy for which a GO has been issued being tracked by another tracking instrument such as another certificate system or by means of contract-based tracking;
- the energy origin represented by GOs is correctly accounted for in the residual energy mix, and the use of the residual mix is mandatory for non-tracked commercial offers;
- prevent claims on more energy than the amount of GOs cancelled, due to an insufficiently precise description of the use in the cancellation statement
- In many EU countries, there is insufficient coordination regarding whether disclosure information relates to the energy product sold, or to the total supplier mix. This leads to significant volumes of double-counting of renewable energy origin. The problem will be corrected by the provisions of the new IEM Directive annexe I.5, which specifically require the disclosure of the electricity provided to the customer (i.e. product mixes) and not the total supplier mix

alone. However, since the problem is so significant, and since the implementation of the IEM requirement needs to be coordinated, there is a need to harmonize procedures relating to the disclosure information that is presented.

Double perception

- Media releases sometimes indicate a lack of consumer trust. This can even happen when all legislative requirements have been fulfilled, and these ensure that the origin of the supplied energy is disclosed on suppliers' invoices, and this is proven by the cancellation of GOs. Consumers in net GO exporting countries sometimes make statements which suggest that all renewable production is consumed in their own country. This causes some consumers in net GO importing countries to be cautious about relying on imported GOs, as they understand that the renewable attributes of the imported GOs have already been claimed in the country of origin.
- This challenge shows the limits of what legislation can do. It requires educational efforts to improve public awareness, especially in net GO exporting countries, that exported renewable attributes cannot be claimed as domestically consumed by any means.
- a clear definition must be introduced, of consumption for which the origin of energy must be disclosed. This also relates to a clear definition of the boundaries of the system to which the GO system applies;
- it should be defined what (level of) supervision is required if the abovementioned requirements are to be met.

System boundaries

- The GO system enables reliable origin tracking as long as the system boundaries are maintained. First of all such boundaries are geographical and political, but also the type of certification / tracking system is in scope.
- Linkages (imports and exports) with another system must mutually incorporate the core principles of the other system. When allowing import and export, the following needs to be taken into account:
  - Export = leakage of attributes must be replaced;
  - Import = make sure quality of the imported GO is maintained, and is not disclosed for use in the exporting country/system;
- Framework containing the conditions on claims on the origin of energy;
- Conditions: there are power connections, AND harmonised GO systems, AND harmonised origin disclosure systems.

Further specific challenges per sector

Gas:

Install disclosure legislation

For gas supply, there is not yet legislation that obliges gas suppliers to use GOs to prove the origin of their claims of renewable gas supply. As there is no system in place that regulates the proof of the origin of renewable gas supply claims, this involves a risk of double claims, as suppliers and consumers might use other channels to make claims on using RES-gas which has been awarded tradeable GOs.

Note: Disclosure legislation surrounding the GO framework cannot be imposed through the standardisation of GOs alone, and requires EU legislative decisions concerning the surrounding framework. A GO scheme will only avoid double disclosure when there is general acceptance that claims cannot be made regarding products from such systems unless GOs have been cancelled (unless it belongs to the residual mix or to a contractual based tracking mechanism set up in a way that it doesn't cause double

counting) since the fundamental underlying principle is that the attributes are represented by the GO.

Heating and cooling: strengthen disclosure legislation

For heating and cooling:
REDII article 24 provides a disclosure framework for renewable heat in district heating/cooling, thus:
"Member States shall ensure that information on the energy performance and the share of renewable energy in their district heating and cooling systems is provided to final consumers in an easily accessible manner, such as on the suppliers' websites, on annual bills or upon request."
This could be strengthened by requiring that the renewable origin should be proven by cancelling a corresponding quantity of guarantees of origin, should these have been issued; and in general by ensuring that the same amount of heat cannot be disclosed more than once.

Corelation with other energy certification systems

Besides the system of guarantees of origin provided by article 19 of REDII, there exist other systems which facilitate claims regarding the consumption of energy from RES.

Some organisations claim to facilitate certificate schemes that have a different purpose than energy disclosure, and such schemes may be interpreted differently by users. E.g. Solarcoin aims to provide support to producers by awarding them "solarcoins", which are subsequently traded on an open market. However, media reports show that solarcoin buyers do make claims about the consumption of renewable energy, even though the solarcoin never expires and even if a GO is issued for the same MWh.

In general, it is of substantial relevance for public trust in the GO system that no claims on the consumption of energy from RES can be made through another mechanism than GOs, if GOs are allowed to be issued for the same MWh.

Renewable energy communities (REDII art. 22)

It must be kept in scope that for the "renewable" energy being transferred within a renewable energy community, then where GOs have been issued for the corresponding amount of production, then these have been cancelled.

Questions for stakeholder consultation

1. Should tradeable GOs be issued for energy that is consumed at the site of the production device?
2. Should it be mandatory for gas suppliers to disclose energy origin on their invoices? If so, should untracked gas be considered to be fossil, or is a residual mix needed?
3. To prevent double counting of non-renewable low-CO2 energy attributes (e.g. for nuclear energy), should GOs be by default available for all energy sources (+require to use for disclosure)?
4. Where are the most prominent risks of double-counting likely to be found?
5. What are the most efficient means to prevent double perception? Open comments are invited.

13. Double disclosure or double perception related to onsite consumption and non-interconnected grids

Electricity: avoid double disclosure of "onsite consumption"

The operators of the guarantee of origin system for electricity have, in most countries, at least 15 years experience in setting up measures which will prevent double counting. A European obligation on electricity suppliers to disclose the origin of their supplied electricity on their invoices, and to prove the renewable origin of this electricity by means of guarantees of origin, gives the GO system a legal underpinning which ensure that "double disclosure" is avoided.

However, there are ongoing discussions on how to remove the risk of double disclosure related to so-called "onsite consumption" (= electricity consumed at the site of the production device without it flowing into the grid).
If onsite consumption is eligible for the issuance of tradeable GOs, it must be clear that electricity consumed onsite cannot be claimed as having green/renewable attributes. One way to establish this is to introduce the principle that tradeable GOs can only be issued for electricity that is made "available to the market for trade". Another way of achieving the same result is by ensuring that only grid-injected electricity qualifies to receive tradeable GOs. Grids here could be defined as distribution systems, transmission systems and closed distribution systems[12] with Third Party Access, in the meaning of the IEM Directive 2019/944.
Either way, in order to avoid double disclosure, the national disclosure framework must incorporate in the residual mix calculation the GOs that were issued for electricity that was not injected into the grid, and for which tradeable GOs have been issued.

On a bigger scale, a similar question arose for electricity injected into island grids, where public opinion sometimes struggles to accept the credibility of export and import to another grid, even if accompanied by solid origin disclosure legislation for electricity suppliers.

Off-grid gas

Like for electricity injected into islands grids, in the opinion of some, it is hard to accept that renewable gases injected into gas grids which are not connected to a gas grid where the gas is consumed, can be sold as renewable gas consumption. GOs however by law facilitate this practice.

Heating grids are not interconnected

Heating grids are not interconnected. This raises the question of whether GOs issued for heating and cooling injected on another heating and cooling grid can be accepted for proving renewable heat supply (see also reasoning in topic 17 on cross border transfer of heating and cooling).

Questions for stakeholder consultation

1. Should tradeable GOs be issued for energy that is consumed at the site of the production device? Y/N

[12] The concept of Closed Distribution Systems is elaborated in art. 38 of the IEM Directive 2019/944/EU.

   a. If yes, what measures should be installed for the avoidance of double counting/double disclosure/double perception?

2. Can GO cancellation be linked to consumption on a grid that is not connected to the grid in which the energy was injected for which the GO was issued? Y/N
   a. If yes, what measures should be installed for the avoidance of double counting/double disclosure/double perception?
   b. If no, how do you explain this in the light of REDII art.19.9[13]?

[13] REDII art.19.9: Member States shall recognise guarantees of origin issued by other Member States in accordance with this Directive exclusively as evidence of the elements referred to in paragraph 1 and points (a) to (f) of the first subparagraph of paragraph 7. A Member State may refuse to recognise a guarantee of origin only where it has well-founded doubts about its accuracy, reliability or veracity. The Member State shall notify the Commission of such a refusal and its justification.

14. Attention points related to GO Cancellation by consumers

Art.19.1 of REDII allows that the GOs may be used by/for suppliers and consumers or their representatives.
Practical experience raises a few points that need attention:

Mitigate the risk of double disclosure

Parties involved in Power Purchase Agreements (PPAs) should cancel GOs in the country of consumption when they claim the greenness of the energy. They do not always do this.
EFET and RE100 promote the cancellation of GOs in connection with claiming green energy consumption and even promote a model PPA template, but not all companies follow this advice. The risks are twofold:

Consumers not cancelling GOs for their claimed RES consumption

Consumers might not cancel GOs for claiming the renewable origin of energy which has been granted GOs. Legislative requirements for cancelling GOs for RES are imposed upon suppliers, but the same level of requirement is not required from consumers.

Failing to involve the Competent Body of the country of consumption

Energy consumption in another Domain may be disclosed without giving notice to the issuing body for the Domain where the energy is consumed. Some traders promote the purchase of GOs in non-AIB member countries, cancelling them there and using them for sustainability reporting. The consequences of this include:

- This may not be included correctly in the statistics of the countries involved. It may not be of similar quality, and there is a risk of double counting, given the lack of assessment of the cancelling issuing body – it is unclear how and whether this would be included in the Residual Mix.
- Consequently, the overall European GO statistics from member state statistics are invalidated along with any residual mix calculations that use them (and the work done in producing these statistics is wasted). This means that policymakers and end-consumers are given the wrong numbers to act upon, which defeats the original purpose of a GO.
- EECS Rule C7.2.1(e)(iii) does not yet prevent a form of double selling, whereby the quality of the electricity is claimed by cancelling GOs, and by the residual mix of the country which unknowingly "imports" it by means of such "ex-domain cancellations".
- However, simply deleting this provision from the EECS Rules will only result in market parties continuing their current practice and recording "disclosure" incorrectly – which would be difficult to detect.

Options for solving the matter

What should happen is for GOs to be moved from the selling country to the consumption country, and then cancelled – this is also required in the EFET PPA contract 3.3.b.
An alternative is to overcome the burden of a multinational company needing to enrol in multiple registries through the centralization, either of the cancellation or of the registries themselves. (see also section 20 IT Infrastructure)

In addition, action must be undertaken in order to:

a. Acknowledge that GOs are cancelled by consumers, and not always by suppliers and to design double-disclosure prevention measures accordingly.

b. This should be done in such a way that the legally-required supervision of GOs by Disclosure Competent Bodies (DCBs) is related to the suppliers' disclosure of the origin of their supplied electricity, and not to consumers' disclosure of this, as that would exceed the responsibility of the DCBs.

Question for consultation

What is your advice for overcoming the concern?

15. Prevention of financial fraud in GO markets

As with many other markets, GO markets are exposed to risks of market abuse that could threaten their integrity and transparency. Market abuse does not only include unlawful operations within the market aimed at influencing other market participants, but also other activities which use the market as a mechanism to commit financial crimes (e.g. VAT fraud, money-laundering, etc.). Effective measures need to be put in place in order to prevent and detect unlawful uses of these markets.

Challenge 1: VAT fraud risk

The AIB has been aware of potential VAT carousel fraud in GO markets for several years. As in CO2 markets, which experienced VAT fraud issues in 2008, VAT fraud in GO markets was typically attempted by traders 'in the middle of the chain'. They would attempt to use trading companies that only exist for short periods to buy GOs and quickly re-sell them. In doing so, they receive VAT on selling their GOs but do not pass on this VAT to the tax authorities. By trading huge volumes of GOs in a short time span and disappearing afterwards, such traders can create significant financial gain from this fraud.

In a basic VAT fraud scheme, a company A (the '*missing trader*') imports goods from another member state. Since these purchases are cross-border, transactions are zero-rated (VAT free). Company A sells these goods locally to company B at a price that includes VAT. Company A becomes liable for the VAT, which it should pay to its tax authority by the end of the relevant VAT period. On the other side of the deal, company B can export these goods exclusive of VAT (or use different buffers before exporting), creating a tax surplus that can be claimed from the tax authority at the end of the VAT period. However, company A fails to pay the tax to the authority and steals the VAT, creating a loss for the Member State.

A VAT carousel fraud is a sophisticated VAT fraud scheme consisting of a chain of transactions where goods are moved around between a series of companies and jurisdictions, creating a cycle that may be repeated multiple times, allowing a significant increase of the volumes of GOs being traded, which both increases the potential harm of such activities and makes them more difficult to detect (layering effect).

Other schemes may involve contra-trading operations, which consist of combining fraudulent and legitimate chains (not necessarily using the same goods) aimed at disguising the fraud and reducing the chance of detection.

The possibility of executing high volumes of transactions in short periods of time within multiple jurisdictions and without the requirement to actually deliver material goods makes certificate systems like GO markets more vulnerable to this type of fraud. This vulnerability is increased by the absence of shared standards on the admission of market participants between different issuing bodies or the harmonisation of methods for detecting potentially fraudulent activities.

Challenge 2: Money laundering risk

In addition to VAT fraud, GO registries are exposed to money-laundering risks. This means that transactions within the registry could be used to introduce money from illicit activities into the economy. This risk might be higher in the GO system where all the trading activity is carried out over-the-counter (OTC), i.e. bilaterally or through the intermediation of brokers. The absence of a central counterparty and regulated market infrastructures reduce transparency and the possibility of detecting fraudulent

schemes. Schemes such as wash trades[14], uneconomical transactions or mechanisms of third-party trading are identified by financial regulators as behaviours that could carry a risk of money-laundering.

Challenge 3: Market manipulation and insider trading

Market manipulation refers to any activity aimed at unlawfully influencing the perception of offer, demand or prices in the market. This may involve trading strategies like collusion between parties, false or misleading prices and dissemination of false information through the medias.

Insider dealing refers to the fact of using inside information (i.e. information not publically available likely to influence prices) in order to execute transactions and take advantage of the information asymmetry.

Affected areas of GO system operation

GO Account holder admission,
GO transfer

Potential options for solving the matter

The AIB has been cooperating with tax authorities and law enforcement authorities at both national and international (e.g. Europol) levels to fight against VAT fraud. Several individual AIB members have contacts with their national tax authorities, and many AIB members have set up procedures for identifying fraudsters, benefiting from the AIB's best practice guide and standard 'know your customer' (KYC) account application form. In addition, the AIB Hub has installed 'alarm signals' based on the systematic analysis of trading activities. Following on from earlier work in developing the best practice guide and KYC form, in 2018 the AIB established its Task Force Fraud Prevention, where AIB members cooperate on VAT fraud prevention measures.
General measures include methods for GO account holder admission and monitoring of the transfers of GOs.

Coordination and standardisation are essential to effectively fight against risks of financial fraud in the GO markets. High admission standards are efficient entry barriers to deter and prevent access from potential fraudsters to the GO system. Additionally, given that financial fraud might involve complex operations not only inter-registry but also cross-border deals, coordinated monitoring involving different jurisdiction is essential. Finally, further cooperation with competent authorities (both locally and at the European level) is crucial to prevent and detect risks of fraud.

Questions for stakeholder consultation

Questions to the market:

- How vulnerable do you consider GO markets are as regards financial fraud? (low, relatively low, mid, relatively high, high)
- In your opinion, what types of financial fraud are the most likely to threaten GO markets? (VAT fraud, money-laundering, market manipulation, insider dealing, none, other – explain-)
- Which of the following are, in your opinion, the most efficient means to prevent financial fraud from taking place in GO markets: a) due diligence during admission (higher barrier to enter the market, Know Your Customer

[14] Transactions where there is no change of beneficial interest or market risk, or where the transfer of beneficial interest or market risk is only between parties acting in concert or collusion

Questionnaire at account holder application), b) efficient surveillance by issuing bodies, c) cooperation with national/international authorities, d) robust contract-based deals, e) education and dissemination, f) changes in tax rules (domestic reverse charge), g), other (specify)

Questions specific to issuing bodies:

- Do you have any procedure in place for refusing the admission (or remove the admission) of suspicious companies?
- Do you have a due diligence procedure (KYC and scoring) when admitting new companies in your registry?
- Do you monitor the activity in your registry on a regular basis?

Questions specific to issuing bodies and tax authorities:

- How many cases of suspected VAT fraud in GO registries have you identified in the last 3 years? (0, 1-5, 6-10, 11-20, 20-50, 50+)
- How many cases of suspected money-laundering in GO registries have you identified in the last 3 years? (0, 1-5, 6-10, 11-20, 20-50, 50+)

- How significant is the level of risk of VAT fraud in the GO market:?
- Open comments

Note: the outcome of the work and input to the consultation on this subject will be confidential/not disclosed other than to the project team and the European Commission.

16. Estimate development of GO market behaviour

Problem Statement / challenge:

The European GO market is untransparent. System operators and market participants, particularly new entrants, lack information about the volumes of renewable energy on the market and the prices of attributes related to different types of renewable energy. This lack of transparency can reduce the confidence of users, observers, and operators of renewable energy markets in Europe. There is also an increased risk of fraud in markets that lack transparency.

In addition, it is currently particularly challenging to estimate the development of GO market behaviour. The translation of the Clean Energy Package into national legislation will impact the GO market to a degree that is difficult to quantify in the middle of an implementation period that runs from January 2019 to July 2021. Article 19 addresses GOs, and makes a number of important changes that will affect the development of GO market behaviour. Not least, the article widens the use of GOs from electricity only, to all forms of renewable energy. The article also makes it mandatory for the first time, for a national issuing body to issue a GO when requested by a producer – in the past this was voluntary. These important changes could alter both the volume of GOs available and their price – impacting the supply and demand dynamic in significant ways that are difficult to predict.

Affected areas of GO system operation

The lack of transparency described above directly affects the transactions of GOs. The lack of publicly available, easily understood and reliable data about the prices and volumes of GOs means that market participants face a number of risks, most importantly whether they will be able to buy or sell the amount of renewable energy they have or want at a price with which they are comfortable. System observers and operators also lack an understanding of how to estimate the development of GO market behaviour – i.e. how prices and volumes are expected to change in the coming months and years.

Potential directions (high level) for solving the matter

Given that the challenge is a lack of data, the clearest solution is the provision of more data. However, if this data is to increase the confidence of market participants and the understanding of market operators and observers, then it must be consistent, reliable, public, comparable and open to examination. This would require that all Member State issuing bodies release information for the same time periods and based on the same definitions of key terms such as 'issued', 'transferred', 'expired', 'withdrawn' and 'cancelled'.

As regards reliable and publicly available price information, this is made particularly challenging by the fact that many GO trades are bilateral, with details that are known only to the parties involved. Some price information is made public, such as that released following national auctions of GOs. However, this data could be made more granular, including the crucial aspect of the difference in prices for different volumes of GOs (buying 100MWh as compared to 10,000MWh).
Mandatory GO price reporting per transaction to the Issuing Body would enable the latter to publish aggregated average prices. This price reporting obligation is currently only available under Flemish legislation, where it results in publicly available monthly statistics[15] on price.

[15] https://www.vreg.be/nl/steuncertificaten-groene-stroom-wkk-en-garanties-van-oorsprong

Questions for stakeholder consultation

1. For issuing bodies:
    a. Do you agree with the definitions of data points as proposed by the project team? Please provide reasons.
    b. Do you think it is feasible for the issuing body you represent to provide data in the manner proposed by the project team? Please provide reasons.
    c. Do you have suggestions for additional data that should be made available by GO issuing bodies? Please provide reasons.
    d. Should there be reporting of price information in transfer? How this could be done in your Member State?
2. For market participants:
    a. Do you agree with the project team's proposals for the provision of data to GO market participants? Please provide reasons.
    b. Should there be reporting of price information in transfer? What level of detail would benefit the market?
    c. Are there additional data on GO markets that you would particularly value? Please provide reasons.

17.Cross-border trade of heating and cooling GOs

Origin disclosure of heating and cooling

The Renewable Energy Directive (2018/2001) stipulates that only GOs shall be issued for the purpose of demonstrating to final customers the share or quantity of energy from renewable sources and that no other form of proof is acceptable. Further, it requires each MS to recognise GOs issued by other MS. This includes GOs for renewable heating and cooling.

However, while Directive 2019/944 on the internal electricity market requires suppliers:

- to disclose the origin of electricity supplied; and
- to use GOs for disclosing the renewable nature of the supplied electricity,

the corresponding requirements in the RED[16] for renewable origin disclosure for the supply of heating and cooling does not relate to GOs.

The question then becomes: how to secure the reliability and credibility of claims made regarding the origin of supply of heat and cold? Since the issuance of GOs for these energy carriers is not linked to a requirement to also cancel them for disclosure, there is a risk of double-counting.

Further, it may be difficult to convince final customers that they were supplied energy with particular attributes where there is no possibility for such energy to actually physically reach them.

Cross-border trade of renewable heating and cooling

REDII art.19 requires Member States to accept heating and cooling GOs for import from other Member States, except where they can substantiate reasons for doubting their accuracy, reliability and veracity. This means that Member States are bound to facilitate cross-border trade of heating and cooling GOs.
The above-mentioned absence of a full-proof disclosure system may, however, make mutual recognition of heating and cooling GOs difficult across national borders.
For the same reasons, it remains to be seen whether there is interest in cross-border trade in renewable heating and cooling.
Low market interest reduces the case for investing in the infrastructure and systems for reliable cross-border trade, which then becomes another reason to question the reliability of the import.
A general question hence is how to carry system development cost for the international exchange of heating and cooling related energy attributes.

Case studies from domains with a legislative GO scheme for heating (and cooling)

In the Netherlands, a GO scheme for renewable heat has already been established. There, GOs for renewable heat can only be used to disclose the origin of heat supplied through a grid to which both the production device *and* the consumer are connected. Our translation of art. 25a, subparagraph b of the Dutch Regulation on guarantees of

[16] REDII article 24. Origin disclosure for heating and cooling: (only for district heating/cooling and only for share of renewable origin):
"Member States shall ensure that information on the energy performance and the share of renewable energy in their district heating and cooling systems is provided to final consumers in an easily accessible manner, such as on the suppliers' websites, on annual bills or upon request."

origin (https://wetten.overheid.nl/BWBR0035971/2020-01-01#Paragraaf6_Artikel25) is as follows:
"For the purpose of art. 77a of the Electricity Act 1998 (as amended) and art. 25, subparagraph 1, a GO for heat produced from renewable energy sources shall only be proof of supply to a final customer **connected to the same grid as that into which the heat was injected.**"
This principle could be applied for cross-border trade, meaning that such trade would be useful for heating and cooling grids that are either situated on multiple sides of the borders of Member States or at least connected across such borders. For the time being, this may limit the extent to which actual heating and cooling GO trade takes place (which may influence MS' willingness to invest in infrastructure that enables such trade). This may change if and when heat and cold grids become interconnected on a larger scale throughout Europe.

In Belgium, Flemish legislation integrated GOs for heating and cooling in spring 2019, and implementation is ongoing. An English translation of the Flemish GO legislation, incorporating GOs for heating and cooling is available at: https://www.vreg.be/sites/default/files/wetgeving_inzake_gos.pdf.
Some of the conditions are:

- the heat or cold must be injected into a grid or a system that supplies more than one consumer.
- Heating and cooling GOs are only issued to production devices with a capacity of 300kW or more. This is the threshold above which an environmental licence of operating is required by law. It avoids also practical administrative problems not incorporating all small household wood pellet stoves.
- Heating and cooling GOs can be used for claiming renewable heat consumption on another heating and cooling grid.
- On the GOs there is data recording on additional fields especially for heating and cooling
    - Type of heat carrier
    - Temperature range of the heating and cooling
- Disclosure legislation is foreseen in two levels:
    - Already in place: "The supply of heating or cooling in the Flemish Region as heating or cooling generated from renewable energy sources shall be permitted where the quantity of heating or cooling supplied in this way corresponds to the corresponding number of MWh of the guarantees of origin for heating and cooling from renewable energy sources having been submitted to the central database, as referred to in Article 7.1/1.1, § 3."
    - In primary legislation but not yet in force and not yet elaborated in secondary legislation:
        - All invoices and printed and electronic promotional material of a heating or cooling supplier supplying heating or cooling via a heating or cooling network shall include the following information:
            1. the percentage of each energy source in the total fuel mix supplied in the preceding calendar year by the heating or cooling supplier via heating or cooling networks in the Flemish Region;
            2. the percentage of each energy source in the heating or cooling product of the customer in question supplied in the previous year by the heating or cooling supplier via heating or cooling networks in the Flemish Region. (…)

The remaining question is: what is required for consumers to trust GOs transferred to them?

Potential solution

Disclosure of heating and cooling from RES needs to be accompanied by the cancellation of GOs.

Consumer trust enhancing

Transparency with extra data fields on the GO could enhance consumer trust, as it allows consumers to make an informed choice. For a heat consumer of 800°C heat, a GO issued for warm water at 60°C has no credible value, as the high-temperature heat has a higher energetic value than the low-temperature heat. When heat temperature intervals are mentioned on the GOs, an industrial consumer of 800°C heat will probably look for GOs issued for a corresponding credible temperature range. Information that influences public opinion on the quality of a GO, in whatever direction, is relevant to be mentioned on a GO. On electricity GOs, a lack of such transparency has given rise to mistrust among consumers and in wider public opinion. By standardising extra data fields on the GOs, relevant for public trust, cross-border trade could be facilitated.
This project cannot oversee whether cross-border trade for heating and cooling GOs will take place, but can look at what is required to enable such trading.

Questions for consultation

- Do you observe market demand for heating and cooling GOs?
- Do you see demand for cross-border trade of heating and cooling GOs?
- Do you see demand for the cross-heating-grid transfer of heating and cooling GOs?

18. Sector coupling and Energy Carrier Conversion => influence on GO market price for different energy carriers

Challenge:

On European markets, we see different orders of magnitude for the prices of GOs of different energy carriers. Electricity GOs being traded in 2019 between 1 and 2 euro, gas certificates often trade at a price which is at least 10, if not 20 types higher.
GOs enhance both the market and consumer awareness. The difference in the price of GOs of various energy carriers might at some point in time become a driver for energy carrier conversion.
As an attention point for issuing GOs for energy carrier conversion, one must be cautious of not interfering with the policy intentions behind existing support systems for a specific energy carrier. In such a way, a specific energy producer might receive windfall profits, and the policy budget for necessary additional investments could be .

Affected areas of operation

Conversion, issuing, transfer, total production counting

Potential directions for solving the matter

Surrounding framework, consciously designed legislation.

Questions for consultation

1) What risks and opportunities for the GO market do you see with regards to energy carrier conversion?
2) Would conditions for issuing GOs after energy carrier conversion, related to the cancelled GOs for proving the origin of the conversion, add value?

4. Cross-border cooperation amongst Competent Bodies for Issuing GOs and for supervising Disclosure

19. Using the Residual mix

The electricity disclosure legislation in the Internal Energy Market Directive obliges electricity suppliers to disclose the origin of their supplied electricity.
For supply not covered by the cancellation of guarantees of origin, the use of the residual mix is advised by REDII art.19.8. The calculation of the residual mix, as advised in the Best Practice Recommendations of the RE-DISS projects, requires aggregating figures on power generation and GO handling across borders to an EU-wide perspective.
After the RE-DISS Projects I and II, the AIB took over the calculation of the Residual mix.

Needing every European country on board for a synchronised practice

In order to keep the disclosure mechanism reliable, in this age with high volumes of cross-border GO trade, it is important that every involved country uses the same method for calculating this residual mix.
The Annex 1.5 of the Internal Energy Market Directive 2019-944 stipulates that every Member State reassures the supervision of this disclosure obligation. There is however no legislative mechanism reassuring these Disclosure Competent Bodies (DCBs) to align their approach on the calculation of the residual mix.
Given problems that have arisen through current practice, the AIB is working to establish an updated residual mix calculation method that it hopes all designated competent bodies (DCBs) will voluntarily agree to adopt.
As there is no formal platform for gathering DCBs (yet), it is challenging to establish this, as the AIB can only facilitate and advise but not require the wide adoption of any new methodology.

The revised RM calculation methodology is available here: https://www.aib-net.org/facts/european-residual-mix.

Note: a webinar will be organised that sets out the Revised methodology for calculating the residual mix. Time and date are available and subscriptions are registered at the above link.

Beyond the current legislative framework

The RE-DIS Best Practice Recommendations start from the legislative framework in place at the time of the RE-DIS project, which ended in 2015. It hence proposes RM figures for individual countries, while sourcing data from a European Attribute Mix (EAM). While EAM calculations are done at pan-European level, there are still calculations for individual countries' residual mixes.
Another way forward could be to calculate the RM on an EU wide basis. This would mean that European consumers buy the European blend rather than the national blend. However, whether this is appropriate depends on the level of participation of all involved countries, which is hard to establish without a legislative framework establishing such.

Questions for consultation:

- Do you have comments on the revised Residual Mix calculation methodology? If so, what are your comments?

- Will your member state use the revised Residual Mix calculation methodology as from the 2020 calculations for 2019 origin disclosure? yes/no/why not?

20.IT Infrastructure

History of EECS Transfer mechanism

The Renewable Energy Certificate System, RECS, was the first international voluntary renewable energy certificate transfer mechanism. As a result of this initiative, the AIB and RECS International were founded in 2002.
The RECS transfer system went live soon after the first registries (the registry shared by the Nordic countries and the Dutch registry) emerged in 2001. In the beginning, transfer of GOs was supported by a data protocol to move XML files over secured emails from one registry to another. As the number of registries grew, peer-to-peer connections became too difficult and the first interconnector hub was introduced in 2007 by the AIB. Since its introduction, the hub has been rebuilt twice; first in 2011 and again in 2016. In its most recent iteration, more centralized elements have been added to the hub to overcome most evident problems of the strongly distributed infrastructure. Such central elements include a centralized account holder database, fraud prevention reports and collection of statistics (being developed at the time of writing this report).

IT infrastructure requirements have grown with the growth of the system

Despite many improvements and the long history, and partly because of it, the current infrastructure – consisting of a hub and separate registries - has weaknesses that need to be addressed to enable the market to develop to the next level. The reasons for the current architecture were partly the result of the organic development of the systems architecture, and partly due to member countries wishing to:

1) exercise direct control over the build, support and operation of their own registries, and encourage competition in software development at a national level;
2) keep investment in software development and operation within their own national boundaries;
3) integrate their systems directly with:
    a. data collection services - e.g. for meter reading and settlements; and
    b. renewable energy support and energy taxation systems;
4) set their own rules for operating an energy certificate system, in a way which offers national flexibility, coordinates with national support mechanisms and reflects national policy initiatives.

The question now is whether to stay with this architecture or to move to one which is partly or fully centralised.

The main challenges are:

1) Inflexibility and high cost of change occasioned by the need to coordinate across many national implementations
2) Harmonisation, due to national subsidiarity and misunderstandings
3) Intransparency on GO trade in the market and for system operators, due to difficulty in obtaining meaningful information about market activity
4) Complex technical dispute resolution
5) Adequacy of market supervision, including fraud detection
6) Barriers of entry due to needs for the specification of system requirements and tendering regulations,
7) Inhibition of free movement of GOs, due to the need for multinationals to register on each registry
8) Speed and integrity of transactions and unnecessary data duplication due to moving GOs from registry to Hub to registry
9) Maturation of the market requiring increasing technical support

10) Costs. The cost of developing and operating the European hub/registry network over a normal lifecycle suggests costs which are disproportionately high compared with those of a mature commodity market.
11) Identification of chain of custody of GOs in support of market supervision (including anti-fraud measures); energy carrier conversion; monitoring and controlling interplay between GOs (REDII art. 19) and sustainability certificates (REDII art. 25-31), and between GOs and EU-ETS; and improved market intelligence.

The timeframe for implementing any answer to this question should take these challenges into account.

Questions for consultation

1. Making abstraction of the timeline of implementation, what would be your preferred level of registry centralisation? Please provide the reasoning behind your preference.
    a. Single European GO registry (such as the EU ETS)
    b. Single European GO registry with a possibility to connect national registry
    c. National/Regional registries and an interconnection hub with centralized transaction log and reporting
    d. National/Regional registries interconntected through a hub
    e. National/Regional registries and standard peer-to-peer connections

2. What is the last time the GO registry of your country was re-build?
3. If a change to the infrastructure would be set-up, and assuming all concerns were overcome, in what year would your country earliest be able to participate?
4. What would be the essential concerns to be overcome for your country to participate in a centralised GO registry (registering ownership and transfer of GOs).
5. What would be the essential concerns to be overcome for your country to participate in a centralised production device registry?
6. Should different energy carriers (power, gas, heating/cooling, and hydrogen) have separate registries/hubs? Yes/no/no opinion/other namely…
7. What are the drivers for your preference? What are your concerns on this subject?
8. Do you have specific suggestions in order to overcome any challenges mentioned here?

21. Compliance and alignment of designated competent bodies for issuance of GOs

The credibility of a GO system in a country also implies credibility of the GOs imported into that country. A country can scrutinise a foreign GO system from which it allows imports. However, when there are many countries from which imports are allowed, such scrutiny becomes a significant burden. This burden is even greater if scrutiny has to be repeated whenever a country updates its systems. Given that every country will have to undertake its own scrutiny, this multiplies the administrative cost for ensuring reliability across all European countries and calls for burden-sharing of such scrutiny activities. On the other hand, countries may have differences in interpretation and different implicit or explicit criteria on reliability.
A Member State has to reassure its consumers regarding the quality of the imported GOs.

Lessons from practice

AIB

Within the AIB, a 'member audit' system has been implemented to ensure that quality is maintained in practice, and this audit is repeated every 3-years. This results in an observation report. Such report facilitates two judgements:

- Compliance with the EECS Rules, the standard to which all AIB members have committed; and
- Individual considerations per country (or region) concerning specific topics, based on the information in the neutral observations.

An AIB audit is performed by a two-person team, consisting of an AIB member and a professional reviewer. The AIB has established a Professional Reviewer Group (PRG), providing a pool of the professional reviewers who take the lead on every audit. In the PRG, the reviewers practice peer-to-peer learning and share knowledge and experience in order to ensure a common approach to, and quality of, audits. The PRG has created systemized processes for conducting member audits, including an audit checklist and a list of good practices. A Member audit is always set up in a constructive atmosphere, as a mutual learning experience for both reviewee and reviewer.

Lessons from this experience are positive. Even with an extensive set of agreements amongst AIB members, almost every member audit brings forward some issues that can be improved. In our experience, issuing bodies find this proves to be useful as it enables them to improve the quality of their operations. From the AIB's perspective, many lessons are learned about on-site practices from member audits. Regularly member audit discussions result in further refinement of the EECS Rules and practices in the respective country.

This also shows the value of having a practical standard in addition to EN16325: an agreement between issuing bodies which is flexibly adaptable to changed circumstances ensures that both the formal standard and the means of its application are enforced, identifying any issues for resolution and improvement, and so promotes the efficient operation of the GO system across Europe.

Further challenges

1. Many issues can be captured in such member audits, but some, however, are not captured, as the audit of an issuing body is designed to be non-disruptive. In view of the volumes concerned, inspection is by sampling, so not all instances of operational activity can be reviewed. Inevitably, this means that some areas of non-compliance may not be detected.

2. When a breach in the agreement between issuing bodies is noted, it is not always easy for a membership-based association like the AIB to take action. Member States have the authority (and responsibility) to set up their own GO schemes, but not to make decisions on those of others -even when they are heavily impacted by them and believe that they could cause reputational damage to the GO system.

CertifHy

CertifHy has solved the compliance issue in another way: a central system was designed, with the CertifHy scheme being centrally managed under a single operator, applicable over many countries. This way, the need for a compliance check by other issuing bodies is redundant, although it does strengthen the need for a rigorous audit of the system operator. Where CertifHy connects to other schemes, this question re-appears on the table.

Ergar

All registries must follow the rules and regulations of the scheme, the set quality requirements and provide for harmonisation of operations.

The registries are admitted to the scheme upon successful initial audit to be carried out by independent auditors following the instructions by ERGaR and the elaborated audit checklists. During operation, yearly production device audits are performed by independent auditors. The complex system of internal and external audits, inspections, risk assessment and sanctions secures the quality of certificates forwarded by every registry.
There is no ongoing cross-registry control system (yet).

Questions for consultation

- Do you value the centralized quality assurance system of the AIB that regularly audits the Issuing Bodies and their Domain Protocols compared to the EECS Rules and reality?
- Do you perceive it to be more efficient than national peer-to-peer checks of the GO Domains from which imports occur?
- Does that relieve your own organisation from doing a lot of work? Or do you have to do these types of checks anyway?
- Or would you simply depend on the reliability of another country's GOs on the basis of them being legal documents?

22.Synchronising discussion fora for gas GO issuing bodies

Synchronising gas GO issuing bodies fora:

For certification and cross-border trade of certificates and GOs in the electricity sector, there has been for many years a common discussion forum within the AIB regarding which currently gathers together 27 officially designated competent bodies for electricity of 24 EU Member States plus some applicants and observer countries. The annual Open Markets Committee, which AIB and RECS International co-organise annually, also provides a forum for market parties and issuing bodies to share concerns and views.

For gas certificate cross-border trade, however, discussion fora are not yet synchronised. Certification bodies for gas from RES are using different methods and standards in their certification systems, and not all of these result in the issuing of guarantees of origin. Some officially designated bodies follow the EECS standard, which consists of a generic energy certificate system with schemes that arrange for energy carrier-specific data, others have carried forward a separate scheme within ERGaR. The hydrogen sector has developed its fundamentals for a GO system under the two FCHJU funded CertifHy projects that Hinicio coordinates.
REDII has for the first time triggered a real need for alignment and provisions for efficient cross-border trade.

Facilitating a joint framework for issuing bodies of GOs of different energy carriers:

Energy will be transferred from one energy carrier to another - gas will be used to fuel electricity production, electricity will be used to produce hydrogen and so on. This calls for the design of a European GO system with a common basis for all GOs. When the GOs for different energy carriers are developed in the same design structure and format, the energy carrier conversion can be accompanied by the conversion of GOs. GOs for a newly generated energy carrier will use the data on the GOs that are cancelled to prove the origin of the converted energy carrier (see sections 7 and 24 on conversion rules and conversion admin).

Question for consultation

- What do you see as necessary measures for synchronising the existing discussion fora for gas issuing bodies?

23.Challenges facing issuing bodies in making collective decisions

The experience of AIB and ERGaR shows that organisations performing the same functions in their home countries can cooperate effectively, independent of their legal status (government agency, TSO, DSO, company, association, etc.).
Also, high value is placed on collaboration between issuing bodies, their harmonised GO handling practices, and the constant updating of the jointly agreed ruleset, flexibly responding to changing circumstances.

AIB now facilitates a market that transfers more than 600 million GOs across national borders in Europe, through an association of TSOs, market operators, energy agencies, environmental agencies, regulators, public companies, … who all have a similar mandate.
Even if Issuing bodies in different countries are assigned exactly the same task, the way such a task is addressed may differ depending on the type of organisation that is mandated to execute it.
In small, immature organisations, this often enriches the value of the jointly created content. Growing big as an association has many advantages of scale. When the highest decision-making body is an organism of >27 members, however, this sometimes challenges the ability of the AIB to be suitably agile. Consisting of many decision-making parties, in addition to the fact that each such party is subject to a different framework of rules, it can be time-consuming to align on ways forward for specific issues. Further, some issuing bodies have time constraints imposed upon them for consultations and approval by ministries etc., which impact the speed at which the association can move, as well as limiting their flexibility. This calls for continuous organisational and process realignment to react to changing market conditions.

Questions for consultation

Do you endorse this observation?
If yes, what options do you see for overcoming it? What would you recommend?

24. Sector coupling & Energy Carrier Conversion => supervision of the issuing process and data management between different organisations

Challenge

Perceived administrative complexity of data handling and checking the monthly amount of GOs cancelled of the input energy carrier.

Affected areas of operation

Issuing, cancellation, synchronising operations of registry operators / Issuing Bodies for various energy carriers.

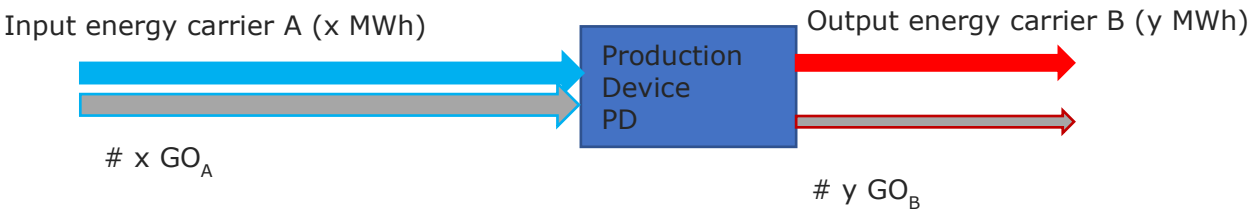
Potential directions for solving the matter

Starting from the proposed rules for the administration of energy carrier conversion in the previous section, the following steps of the GO issuing process are affected when the origin of energy conversion is to be proven using cancelled GOs:

1) The process of GO application: the producer applies for GOs to an issuing body.
2) The data input in the registry of the issuing body (or its agent)
3) The conditions for issuing GOs in the case of conversion (of which the origin is proven with cancelled GOs)
4) The data content on the GOs to be issued in the case of conversion (of which the origin is proven with cancelled GOs)
5) The amount of GOs to be issued containing a specific set of data

Process steps for GO issuing in the case of conversion of which the origin is proven with cancelled GOs:

1) Applying for GOs:
    a. Issuing body /Production registrar handles the application for GOs for fossil production device PD like a normal GO application. Including Inspection of meters, energy flow diagram, ...
    b. Additional in the application: producer's commitment to submit monthly GOs: e.g. by a statement to be signed (issuing body could foresee a template or this).
2) Data Input in the registry of the energy carrier B Issuing Body (or its agent):



    a. The following measurement data is registered in the registry of the issuing body (or its agent):
        i. Measured input: x MWh
        ii. Measured net output y MWh (= that gives entitlement to GOs from energy carrier B on condition #x GOs for energy carrier A are submitted).
    b. In order to enable GO issuing, there must take place some checks:
        i. Have the sufficient GOs been cancelled for the input energy carrier a?
        This check seems easy, but in case of large numbers of conversion devices, the issuing body may meet managerial constraints:

1. Does he have access to the registry where the x GOs of energy carrier A are cancelled?
2. Can he see that these x GOs have been effectively cancelled?
3. Is it confirmed to him that these x GOs of energy carrier A are cancelled for the purpose of the energy conversion in this specific production device PD and for this specific period of production of energy carrier B?

ii. Do the cancelled GOs meet the requirements?
1. Check Parameters of alpha: Energy carrier == A
2. Production period still valid
3. Energy source criteria,
4. ….

In case the GOs of both energy carriers A and B are managed in the same registry, these checks can easily be automated in the software of the registry:

iii. Software rule: "Above measured input can lead to issuing of b GOs for energy carrier B, **if** the producer submits x GOs of type A and characteristics alfa, then y GOs may be awarded for energy carrier B with characteristics beta."

In some countries, for historical reasons, it is not self-evident to organise the issuing of GOs in a single registry per country. In that case, procedures need to be set up for communication between the different registries that hold the GOs for energy carriers A and B respectively. Depending on the allocation of roles to organisations within a country, the organisation of this communication might be different, hence this document does not elaborate in detail on the options on this subject. It should be discussed at a national level whether it is up to the producer to prove the above checks can be confirmed, or up to the different issuing bodies involved for A and B to design a framework. In any case, the system must be designed in such a way that no double counting can occur, and the issuing body for energy carrier B needs to be sure that this is the case.

3) Conditions for actual issuing of GOs of energy carrier B:
   a. Production registrar of energy carrier B has approved an application from production plant PD
   b. Link to measured production y of energy carrier B based on a registered production installation fed with energy carrier A

4) What data to mention on the GO of energy carrier B:
   See Conversion rules under section 7 Energy Carrier conversion: Rules for GO issuing related to energy carrier conversion.
5) GOs of energy carrier A from different installations/production periods => how many GOs of energy carrier B with each data set?

   x> y => Pro rata allocation and completion
   x1 / x = y1 / y GOs with the characteristics of the submitted x1 GOs
   x2 / x = y2 / y GOs with the characteristics of the submitted x2 GOs
   xn / x = yn / y GOs with the characteristics of the submitted xN GOs

   With
   x = measured input, y = measured net output that is entitled to GOs, and
   x = (x1 + x2 + ... + xn)
   y = (y1 + y2 + ... + yn)

   x <y => also pro rata

Consultation

Did your country already consider the above challenge? (yes/no/I don't know).
Would the approach described here, work for your country?
Comments?

What challenges do you see in the data management within a Member State, which are not addressed here?

5. Other

25. Other challenges that exist in the management of the GO systems

Invitation to consulted experts, welcoming descriptions and views on challenges which are not yet mentioned above.

A text formulation clearly describing the challenge and setting out pathways to a potential solution is invited (max 2pages) by 28th of February.