Renewable Gas Tracking Systems

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# Introduction

This document is prepared by the associations EBA (European Biogas Association), WBA (World Biogas Association), RNG coalition (Coalition on Renewable Natural Gas) and ERGaR (European Renewable Gas Registry) as an overview of different biomethane environmental attribute certification systems in the world. The purpose of the paper is to serve as proof of evidence for the SBTi consultation on the effectiveness of environmental attribute certificates (EAC) in corporate climate targets.

Multiple systems of tracking renewable gas certificates currently coexist. The systems differ on aspects such as the characteristics of the gas that they track (e.g. renewable character or sustainability), their chain of custody or their chain of traceability. The latter is normally one of the key differences and there are generally two systems of traceability. The so-called book and claim and mass balancing. In short, the book and claim principle allows the separate trade of the physical gas and the certificate, while the mass balancing system sets rules on trading the certificate together with the physical gas along the supply chain.

There are many varieties of book and claim and mass balance systems which can support a range of outcomes from driving value to producers or structuring support schemes and meeting legal requirements. This paper sets out the legal framework and main types of EACs for biomethane in use in Europe, America and globally. This document is expected to be updated in the coming weeks and any updates will be shared with SBTi.



# 1. Market-based systems in European Union

## 1.1. Guarantee of Origin

## **LEGAL BASIS**



#### • EU legislation

The EU Guarantee of Origin (or GO) is introduced in the Renewable Energy Directive 2009/28/EC. In this directive the GO was only applicable to renewable electricity production. With the second Renewable Energy Directive EU/2018/2001 (RED II) the GO also became applicable to gas including biomethane and hydrogen. In article 19 of the RED II the main requirements regarding the GO are stipulated. It includes requirements on the specifications on the content of the GO and the obligation for Member States to set up a national framework for GOs. It is stated that GOs from outside the EU are not recognized unless there is an agreement with the third country. Furthermore, it is stated that Member States or designated competent bodies shall put in place appropriate mechanisms regarding the GO system. For the appropriate mechanisms there is a reference to the European standard EN 16325 for more detailed requirements to ensure the system is accurate, reliable and fraud-resistant.

A recast of the Renewable Energy Directive has been agreed by the EU institutions and publication is expected soon. There are no major changes on the GO requirements in comparison with the RED II except further clarifications on the Union Database.

#### • European standard

An update of the EN 16326 is currently being prepared by CEN/CENELEC Joint Technical Committee 14. The participants of this working group are coming from national registries, ministries, consumer organisations and industry associations. This standard sets more detailed requirements for the processes regarding GOs. It is expected that the updated version will be published in 2024.

#### • Purpose

The purpose of the GO is consumer disclosure (as opposed to compliance with legislation related to fuel quota obligations etc.). In recital 55 of the RED II is written:

Guarantees of origin issued for the purposes of this Directive have the sole function of showing to a final customer that a given share or quantity of energy was produced from renewable sources.

#### National legislation

In the RED II is written that the Member States shall set rules in national legislation regarding the GO which are in line with the EU legislation. Therefore, all requirements of the RED II are transposed to national legislation. An important part of this transposition is appointing the designated competent bodies (i.e. issuing bodies) that are responsible for the supervision and organization of the system of guarantees of origin. These designated bodies are responsible for the national registries for electricity, biomethane and/or renewable gas.

# **IN PRACTICE**

Since the practical aspects of GOs are set in national legislation these differ between the Member States. However, there are certain general principles and below a description of the general situation in the Member States.

#### • Obtaining a GO

To obtain a GO as a producer of biomethane the producer needs an account at the national biomethane (GO) registry. This includes an administrative process to request this account and an audit to validate that the company or operator and plant meet the legal requirements. After having access to the producer account the producer needs to submit a production declaration which is checked with the meter data from the network operator. After verifying the producer. This means the producer has a certain amount of biomethane GOs on his producer account.

#### • Trading

The trading principle behind the GO system is book and claim. This principle means that a certificate is traded separately from the physical gas. A producer can reach a commercial agreement to trade the GO with a trader or an end-user and another commercial agreement to supply the physical gas. If there is a commercial agreement for the GO between the producer and a trader or end-user, the producer can connect to the biomethane registry and transfer the GO from the producer account to the trader/end-user account.

For cross-border trading there are several options within Europe. The European Renewable Gas Registry (ERGaR) manages a platform that makes it easy for its system participants to trade the GOs (and other certificates) cross-border. At the moment the Netherlands, Denmark and Slovakia are the issuing bodies connected to the scheme. Moreover, the Association of Issuing Bodies (AIB) will provide a similar scheme to facilitate cross-border trade for gas with an increasing number of their members issuing Gas GOs as part of the transposition of RED II into national law. Additionally, there is the option for a bilateral agreement between two registries. It is the expectation that these will cease to exist with all registries being connected to a cross-border scheme.

#### • Retiring (or cancellation)

At the end of the process the end-user wants to make use of the GO for its own disclosure. At this stage the end-user will retire the GO in the national biomethane registry. A retired GO cannot be traded anymore and can only be used for the disclosure of the one company for which it was retired. A GO is valid for 12 months after the production of the biomethane as set in the RED II.

#### • How is the quality ensured?

Each national registry has its own processes to safeguard the quality and avoid double counting. Examples are:

- Each plan/company is audited before it can join a biomethane registry.
- The production declaration is checked with the meter data from the neutral distribution system operator.
- The registry ensures that each GO can only be owned by one party to avoid double counting.
- There are fixed procedures where a GO cannot be traded when it is in the process of being traded cross-border.
- Others.

# **1.2.** Proof of Sustainability

# **LEGAL BASIS**



#### • EU legislation

A Proof of Sustainability (PoS) is a certificate that is not explicitly mentioned in the EU legislation. It is a result of the requirements set in article 25 to 31 of the EU Renewable Energy Directive. In these articles the sustainability criteria for biomethane are stipulated and the process to prove compliance with these sustainability criteria. If a certain consignment of biomethane meets the sustainability criteria set in the legislation a PoS can be issued for this consignment. Sustainability criteria are for example greenhouse gas emission criteria.

#### • Voluntary schemes

The so-called voluntary schemes play an important role in the process to issue and trade a PoS. The voluntary schemes are approved by the European Commission to establish a scheme regarding a proof of sustainability. Only if a producer is recognised by a voluntary scheme it can issue a PoS for its consignment of biomethane or a trader can trade biomethane with a PoS. The basis for the rules of a voluntary scheme are all based on the EU legislation, the practical details are all worked out in the different scheme rules. Examples of voluntary schemes for biomethane are ISCC, REDCert, BetterBiomass and 2BS.

#### • Purpose

The purpose of a PoS is to show that a certain consignment of biomethane is compliant with the sustainability criteria in the EU Renewable Energy Directive. Consequently, this biomethane consignment can be used to meet the different quotas and targets set in the EU legislation. Biomethane with only a GO cannot be used for meeting the EU targets.

### HOW DOES IT WORK IN PRACTICE

#### • Obtaining an PoS

The first step of the process is the recognition of the voluntary scheme. A voluntary scheme needs to meet the legal requirements and if this is sufficient it will be approved by the European Commission. Afterwards the voluntary scheme can allow producers to issue a PoS and traders to trade a PoS.

A producer can be approved by a voluntary scheme. This happens after a positive assessment by an external auditor that verifies if the producer meets the criteria of a voluntary scheme. If approved, the producer of biomethane can issue itself a PoS for the biomethane consignment. On the PoS there are several pieces of information such as the owner, producer and GHG calculations.

#### • Trading

When a PoS is issued it can be sold to another party such as a trader. The PoS itself is easily transferred by filling in a simple document with the seller and buyer. However, the other part of the transaction is the joint sales with the physical biomethane. PoS trading follows the principle of mass balancing. Roughly

speaking, this means that the gas and certificate are traded together and follow the same supply chain. For biomethane this is practically not possible as the gas grid is used and the molecules cannot be tracked, but the principle stands that physical gas and the PoS are sold together and also bought together by the end user.

In the intermediate steps a trader can trade the PoS and the biomethane. This is done by selling and buying the physical gas and transferring a relatively simple document. These traders are also audited by the voluntary scheme to verify the mass balancing system.

At the final phase of the process the end user will have a PoS that it can use for target counting.

#### • Union Database

The process to trade a PoS is expected to change significantly next year. The European Commission is setting up a Union Database that serves as mass balancing database for all PoS in Europe. At the moment, not all details are known and therefore, it is only mentioned here as something that will change in the future.

#### • Differences between GO and PoS

There are several differences between a GO and a PoS. The main ones are:

- Biomethane with a PoS needs to meet sustainability criteria and for a GO it just needs to be biomethane.
- The GO follows the book and claim principle, which means that the certificate can be traded separately from the physical gas. For a PoS it is the mass balancing principle where the biomethane and certificate are traded together.
- GOs are issued by a GO registry and a PoS is issued by an approved producer.
- A GO is traded by using a GO registry and a PoS can be traded by approved traders and producers without an external party.

# **1.3.** Non-official certificates (e.g. dena, AGCS)

# **LEGAL BASIS**



In the RED II there is only an explicit reference to Guarantees of Origin and implicitly to Proofs of Sustainability. However, there are biomethane registries within Europe that are issuing certificates that are similar, but not exactly the same. Examples are the AGCS biogas registry in Austria and DENA's biogas registry in Germany. These can be based on national legislation and can have started before there was EU legislation on biomethane certificates available. Even though they are not based on EU legislation they still have similar characteristics and quality assurance procedures. However, there are also differences as these registries can have functions other than consumer disclosure. They can be used for target accounting and eligibility proof for financial support as well. Furthermore, they can make use of the mass-balance principle as explained in the previous chapter.

Since there is no harmonised legislation or rules on the practical side of these other European certificates, there are some differences in the organization of the schemes for these other certificates. However, it can be said that the scheme rules for these certificates follow similar quality assurance principles as for the GO and PoS. To obtain the certificate it is still needed to make a producer account and the information is audited before an account is created. Furthermore, trading between producers, traders and end-users is possible. An, it is the national registry that keeps track of the ownership of these other certificates to avoid double counting. For cross-border trading, the ERGaR scheme with Certificates or Origin can be used as the ERGaR scheme rules also allow the transfer of other certificates than official GOs. One difference which is applicable to the German biogas register is the need to prove that also physical gas flows from the producer to the end-user according to the mass balancing principle.

# 2. Market-based systems in the USA

## **LEGAL BASIS**



The US currently employs multiple tracking methodologies that are generally specific to the market in which a given unit of biomethane is being used. The primary compliance markets and their legal basis for the use of biomethane tracking are as follows:

- M-RETS Tracking System A independently operated, non-profit platform used for tracking Renewable Thermal Certificates (RTC) in both voluntary and compliance markets. M-RETS is the only renewable tracking system in North America which covers multiple use-cases. Use of the platform continues to grow with an increasing number of voluntary renewable gas transactions in the US, as well as a growing number of programs which use the tracking system for RNG procurement. This is the most comparable to the European tracking systems, however, this system is not government operated; there is no legal basis for its creation, but there is legal basis for its use in various programs (see below).
- California Renewable Gas Standard <u>SB 1440</u> (2019) Required the California Public Utilities Commission (CPUC) and California Air Resources Board (CARB) to consider adopting RNG procurement targets for each gas company, resulting in a 2025 target of 17.6 BCF/yr and a 2030 target of 72.8 BCF/yr (approximately 12.2%) for IOU core gas customers statewide. CPUC's adopted decision, which specifies the use of M-RETS tracking system, can be found <u>here</u>.
- Oregon Renewable Gas Standard <u>SB 98</u> (2019) Required the Oregon Public Utility Commission to adopt by rule a renewable natural gas program for gas utilities which allows for cost recovery and targets RNG procurement for utility customers. Includes non-binding targets of 5% (2020-2024), 10% (2025-2029), 15% (2030-2034), 20% (2035-2039), 25% (2040-2044), and 30% (2045-2050). The 2020 Order in Docket AR 362, found <u>here</u>, establishes a legal basis for the use of M-RETS.
- Oregon Clean Fuels Program <u>SB 324</u> (2016) Requires a 20% reduction in fuel carbon intensity by 2030 and a 37% reduction by 2035. This program requires the use of M-RETS for RNG procurement, which is described <u>here</u>.
- Washington Clean Fuel Standard <u>HB 1091</u> (2021) Created a clean fuel standard in Washington which includes the use of RNG and other renewable gases. Its regulation, found <u>here</u>, requires the use of M-RETS "or another approved and recognized tracking system" for RNG.
- US Federal Renewable Fuel Standard Created by the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007, the Renewable Fuel Standard regulations can be found in <u>40 CFR Part 80, Subpart M</u>. The program requires 3<sup>rd</sup> party verification and attestations to certify RNG transactions. Credits are generated and retired in the Environmental Protection Agency's EMTS system.
- California Low Carbon Fuel Standard <u>AB 32</u> (2006) The LCFS <u>regulation</u> created pursuant to California's GHG reduction mandates which includes the use of RNG and other renewable gases. The program requires 3<sup>rd</sup> party verification and attestations to certify RNG transactions. Credits are generated and retired in CARB's LRT system.

# FOR WHAT IS IT USED?

Apart from the various frameworks which are program-specific to three transportation decarbonization policies, M-RETS serves as the most widely used renewable gas tracking system in North America. Importantly, M-RETS has the ability to cover transactions in both the voluntary and compliance markets, with safeguards against double-counting of renewable gas used in non-covered programs. M-RETS also has the ability to cover hydrogen and transactions of other renewable thermal technologies.

# HOW DOES IT WORK IN PRACTICE?

#### • Obtaining the certificate

In M-RETS, RTCs must include all environmental attributes, and can optionally include full or partial lifecycle emissions data. Generators first upload information proving that a certain amount of renewable gas was injected into the pipeline. Qualified Generation will receive one RTC per Dth of energy.

• Trading

Users of M-RETS may transfer active RTCs to another organization or another active account. Users are responsible for initiating and completing all certificate retirements. Retirement is the final disposition of the certificate, once retired, certificates cannot be transferred. Retirement is done to make a claim on the certificate.

#### • How is the quality ensured?

The M-RETS RTC system has established a rigorous verification protocol that fulfils two critical functions: firstly, it safeguards the authenticity of the RTCs by confirming that the originating generator is real and operational. This confirmation is achieved through the review of mandatory Professional Engineering Reports, Interconnection documentation, LCA reports, and other requisite paperwork.

Secondly, the protocol serves as a preventative measure against double-counting by conducting a meticulous cross-reference with other tracking systems, which encompasses carbon offset registries. Furthermore, M-RETS generators must report 100% of gas injected, even if part of that volume is to be used outside of M-RETS. Such volumes are considered Non-Qualified Generation and will not be awarded certificates within the M-RETS system.

# 3. International market-based systems

# **3.1. International Renewable Energy Certificates (I-REC)**

## **OFFICIAL BASIS**



International Renewable Energy Certificates (I-RECs) are a type of environmental attribute certificate (EAC) which certifies the production of energy along with details of its generation. The International REC Standard Foundation is an internationally standardized, locally implemented non-profit organization that does not distribute I-RECs itself but governs the system through the International Attribute Tracking Standard. The I-REC Standard has been acknowledged as a reliable tool in the creation of credible and auditable tracking instruments by the Greenhouse Gas Protocol, CDP, and RE100. The Standard was created by board members consisting of industry experts from around the world who specialize in the use and creation of attribute tracking certificates and systems.

The Standard is a set of requirements that ensures a high-quality attribute tracking system which meets the rigorous expectations of the industry. As such, the Standard guarantees that all products adhere to the same requirements, and it organizes both tracking systems and their associated markets. The Standard was created by design to describe the tools to make a highly functional attribute system, but it is not limited to a specific commodity. Rather, it is applicable to any commodity (for example, biomethane) that may benefit from attribute tracking and offers a unified means of doing so. By consequence, the International Attribute Tracking Standard can be implemented anywhere, and it requires local stakeholders and government authorities to facilitate the national or regional establishment of the system in adherence to local/regional/national regulations.

The I-REC Standard most notably incorporates two key elements:

- 1) A list of rules, regulations, and best practices to be used by attribute tracking systems, which combine to make the I-REC Code. The Code provides the blueprints which allow a standardized tracking system to be implemented in any country or region.
- 2) An operational attribute tracking system, based on the I-REC Code, that can be made available in countries without a reliable tracking system in place already.

a. While a system can be implemented on a voluntary basis, the I-REC Standard prefers implementation in collaboration with national/regional regulation or policy-making authorities. The Standard supports compliance both with government requirements and with voluntary consumers that wish to track or verify their progress.

## HOW DOES IT WORK IN PRACTICE?

Purchasing an I-REC allows a user to claim consumption of renewable energy, granting them the ability to assert reliably their usage of clean energy. Because I-RECs can originate from many types of renewable energy, end-users are provided with a choice of energy product. Each I-REC serves as EAC that is transferable proof of renewable energy, evidencing the production of that energy. They offer reliable

reporting to a number of requirements, including Scope 2 reporting of the Greenhouse Gas Protocol, national energy reporting, general end-user claims, and support mechanisms.

As of 2023, there are 62 active countries where the I-REC Standard is implemented. Most of these countries are in Africa, South America, and Asia; some examples include China, Australia, Japan, India, Brazil, Mexico, and South Africa.

#### • Implementation and Obtaining I-RECs

The Standard identifies several key players in the tracking system.

- **Market Facilitators** are organizations that have recognized the need for an attribute tracking system and therefore used the Standard to develop a product market.
- Code Managers facilitate the roles of products and ensure reliable implementation through rules.
- Issuers are organizations, such as a government agency or independent entity acting with governmental support, that control registration of facilities, oversee and verify data, and issue I-RECs.
  - Issuers are established either a) as a result of a governmental order, appointment, or decree, or b) through the I-REC standard as elected by market players.
  - All Issuers must sign the Issuer Agreement, wherein they pledge their independence, reliability, and transparency.
- **Participants** are those who wish to hold or trade I-RECs with an account on the I-REC registry.
- **Registrants** are energy generating facilities that register their production stations and request I-REC issuance either on their own behalf or on behalf of a third party.

Upon establishing a tracking system, Market Facilitators are checked to ensure they meet expectations and follow Standard requirements. The I-RECs accreditation process is upfront and ongoing. Participants involved can track attributes of renewable energy production from its location of generation to its place of consumption. These attributes are factual, auditable statements of generating facilities and generating events. The resulting Digital Statement (certificate) is equivalent to 1MWh of energy produced from a single facility.

All Registrants that produce energy must adhere to local/national/regional regulations of production, bearing in mind that local/national/regional markets may have different regulations (i.e., permits, frequency management, grid balancing, etc.). The Issuer distributing the certificates must audit that the attributes declared by the Registrant are both true and factual. After third-party verified information has been received by the Issuer, it then reviews the request and issues the I-REC for the production facility using the electronic I-REC registry.

Each individual I-REC must always be contained in an account akin to a bank account, so the Registrant must declare which account will receive their issued I-RECs. Each issuance request may go to a different account; the centralized registry allows for the easy monitoring and auditing of this process.

#### • Trading and Quality Assurance

The trading principle behind the I-RECs standard is book-and-claim, meaning that a certificate is traded separately from the physical gas. Participants in the attribute tracking system may have two types of I-REC accounts: trade accounts and redemption accounts. Trade accounts allow certificates to be transferred between Participants or to clients. Redemption accounts allow Participants to redeem the attributes contained within an I-REC. An energy generator can open a trade account and become a Participant to hold, trade, or redeem issued I-RECs. Issued I-RECs can only exist in a single trade or

redemption account at any time. Individual certificates can never be in two accounts simultaneously. The standardization of the I-REC Code leads to simpler consumer claims and eliminates any chances of double claims, counts, or certificate issuance.

Owners of trade accounts have the right to move, trade, or sell certificates as they wish. That person is the owner of all the I-RECs in their trade account. Participants maintain the right to claim or use consumption of the renewable energy corresponding to the amount stated by the I-REC(s) in their redemption account. When an I-REC is transferred to a redemption account, the certificate is redeemed. A redeemed certificate can never be transferred to another trade or redemption account. At this point, the attributes of the I-REC are redeemed on behalf of the redemption account's authorized user or owner, allowing for easy auditing or a certification of mandatory compliance.

# 3.2. United Kingdom - RGGOs and PoS use

The UK has left the European Union, but similar systems are in place either as a legacy of being in the EU or because of market demand for consumer disclosure of biomethane.

## **LEGAL BASIS**

The legal basis for market-based reporting of biomethane via the grid is provided for in the Renewable Transport Fuel Obligation - <u>The Renewable Transport Fuel Obligations Order 2007</u> (legislation.gov.uk) and the Green Gas Support Scheme - <u>The Green Gas Support Scheme</u> Regulations 2021 (legislation.gov.uk).

As the UK is no longer a member of the European Union it has not implemented the RED II Article 19 legal basis for issuing of Guarantees of Origin although such a GoO system is in place and has been established for over 10 years.

## FOR WHAT ARE POS AND RGGOS USED

#### • Allocation of biomethane to transport users to fulfil the biofuel quota

Proof of Sustainability (PoS) documents are used to show the allocation of sustainably biomethane to transport users. A full set of requirements is provided by the UK department for transport here - Renewable Transport Fuel Obligation (RTFO): compliance, reporting and verification - GOV.UK (www.gov.uk). The PoS documents required have been described in the above sections related to the EU framework.

RTFO statistics show that over 500GWh of biomethane production was supported in 2022 via this system for market-based reporting. <u>Renewable fuel statistics 2022</u>: Fifth provisional release - GOV.UK (www.gov.uk)

#### • Allocation of biomethane for consumer disclosure

RGGOs are used to allocate biomethane injected in the UK gas grid to grid connected consumers in the UK and in neighbouring European countries.

Consumers may be using gas for heat, power or transport and will have a variety or reporting requirements that apply to them.

# HOW DOES IT WORK IN PRACTICE

#### • For GoOs

*Obtaining the certificate* - Biomethane producers join the Green Gas Certification Scheme (GGCS). The GGCS is a private registry that has been recognised by the UK government as an approved certification scheme for particular functions. Once RGGOs have been issued to a producer they can be transferred to a trader account. They can then be transferred onwards to other trader accounts or retired and allocated to a gas consumer. The RGGO lifecycle is shown here- <u>Flow Diagram - Scheme - Green Gas Certification</u> <u>Scheme</u>.

RGGOs can be exported and imported with other registries via the ERGaR Certificate of Origin Scheme – <u>ERGaR CoC Scheme – ERGaR</u>.

*Quality is assured in the following way;* The rules of the scheme are published here - <u>Scheme Rules -</u> <u>Governance - Green Gas Certification Scheme</u> and the scheme is externally audited every year to check that those rules have been followed. That audit is available on request to relevant stakeholders (contact the scheme here - <u>Contact - Green Gas Certification Scheme</u>).

All biomethane producers must provide the GGCS with an independent audit which assesses if the correct RGGOs were issued. This includes checks on primary data such as TSO/DSO injection data and feedstock inputs.

All EACs (RGGOs) are issued, transferred, and retired within a secure electronic database.

#### • For Proof of Sustainability EAC

*Proof of Sustainability documents are administered in the following way* - UK based producers and traders of biomethane become Certified under a Voluntary Scheme. The most common scheme is ISCC - <u>ISCC</u> <u>System – Solutions for sustainable and deforestation free supply chains (iscc-system.org)</u>.

To become certified, they must employ a certification body who will conduct an audit of their activity each year, including which PoS EAC's they issued. These audits check for any double counting and that the information regarding biomass inputs and GHG emissions was correctly recorded.

# Annex: Potential market impacts on action/inaction and additionality driven by certificates

The system of certificates as described above has been a key driver of the production of biomethane in the European Union, the United Kingdom and the USA.

Below are some sample pricing data collected from independent parties being Argus Media, Cornwall Insights and S&P Platts.

Note that biomethane certificates are not a fully standardised product across UK and EU and depending on the type of certificates and if an associated Proof of Sustainability has been issued, they are either only for voluntary carbon reporting or may have a value in a compliance market e.g. the EU ETS. For example, UK RGGOs may be used in voluntary markets but a Dutch GO may have a PoS attached and be valid in the German transport market.

At the same time some reported prices reflect the highest prices on the spot market while others reflect longer term agreements that may be part of border negotiations between two parties.

The values shown below should be taken as indicative and the data suppliers will be able to provide more details of which prices they reflect in which markets. The industry as a whole is at the beginning of journey to analyse the trends in the certificate market (both in price and volume), and we anticipate updating this Annex in 2024.

# **1.** Certificates provide significant additional income vital to the business case for biomethane production

#### 1. Prices of Guarantees of Origin in the U.K. (RGGO) have been above €5/MWh for several years now.

Taking the U.K. as an example, average RGGO prices have been above €5/MWh since at least 2018, reaching around €9/MWh in 2022, according to data reported by Cornwall<sup>1</sup> (see Figure 1). For biomethane produced exclusively from waste, Argus reported prices between €18 and €18.9/MWh from 2022 to 2023<sup>2</sup>. This higher price may be explained by the regulation-driven interest of motor fuel suppliers to procure more and more biomethane considered "advanced" by the legislation and that carries higher GHG emissions savings compared to conventional oil-based fuels.

This income is additional to British government support for domestic biomethane production and is a recognised part of the support system<sup>3</sup>.

<sup>&</sup>lt;sup>1</sup> Cornwall's data are based on surveys of industry stakeholders using RGGO. RGGO Prices across vintages are based on a survey carried here in July 2021. Under the scheme operated by the Green Gas Certification Scheme, RGGOs have expiry dates 3 years and 3 months (39 months) after issue.

<sup>&</sup>lt;sup>2</sup> Argus' methodology is based on surveys and direct industry data from trades, bids or offers for a minimum of 1 MWh. Wastebased RGGO assessed by Argus are certified to be compliant with the RED Sustainability requirements. To know more about their methodology: <u>https://www.argusmedia.com/-/media/Files/methodology/argus-european-natural-gas.ashx</u>. Conversion from GBP to EUR was based on the rate of 30/12/2022, GBP = 1,13071 EUR.

<sup>&</sup>lt;sup>3</sup> See the Final Impact Assessment of the Green Gas Support Scheme / Green Gas Levy as published by the Department for Business, Energy and Industrial Strategy (BEIS):

https://assets.publishing.service.gov.uk/media/61422e36d3bf7f05aa5f92d8/green-gas-impact-assessment.pdf



Figure 1. Average RGGO Prices in the UK (2018-2023)

2. Prices of Guarantees of Origin or Certificates of Origin account for a significant share of the average production costs in several European countries.

- A report of the Biomethane Industrial Partnership<sup>4</sup> calculated average production costs based on real industry data. It estimated the average production cost for medium-sized anaerobic digestion units (500-1,300 Nm<sup>3</sup>/h) to be €84/MWh<sup>5</sup>.
- Average 2022 spot prices were compared against this average product cost for the U.K., the Netherlands and Germany. GO/CoO from these countries can be traded over the counter from one of these countries to another, through the ERGaR CoO Scheme commissioned in late 2021. The sale of certificates could cover from 27.4 to 55% of an average production cost of €84/MWh (see Figure 2 and Figure 3). The average spot prices used here are based on assessments by Platts of the daily spot market from 23/02/2022 to 30/12/2022. Their "spot assessment reflects transactions for immediate delivery where contracts have a minimum validity of three months from the date of transaction"<sup>6</sup>. For the Netherlands and Germany, prices reflect guarantees or certificates of origin for certified biomethane volumes (environmental sustainability certified as per the RED Framework) which explains the higher spot prices compared to the ones assessed in the U.K.

	€/MWh	Share of production cost
Average RGGO Spot Price in UK. (Platts)	23.0	27.4%
Average GO Spot Price in NL (Platts)	41.6	49.5%
Average DENA's certificate Spot Price in DE (Platts)	46.1	54.9%

Figure 2. Average spot prices of certificates in 2022 and theoretical share of average production costs

<sup>&</sup>lt;sup>4</sup> "The BIP is "an industrial partnership in which policy makers, industry and other stakeholders team up with the goal to support the achievement of the target of 35 billion cubic metres annual production and use of sustainable biomethane by 2030, and to create the preconditions for a further ramp-up of its potential towards 2050." It is a public-private initiative officially launched by the European Commission and the European biomethane industry in September 2022. Read more on the BIP and its Task Forces: https://bip-europe.eu/.

<sup>&</sup>lt;sup>5</sup> To know more about the analytical methodology, access the report: https://bip-europe.eu/downloads/.

<sup>&</sup>lt;sup>6</sup> Platts' assessments reflect bids, offers and transactions of a minimum of 1GWh of Biomethane GOs and RGGOs, as reported in either the Platts Market on Close assessment process, in the brokered market, or on trading and exchange instruments. Assessments are timestamped to 16:30 London time and are published according to the Platts London holiday calendar. Read more on their methodology:

https://www.spglobal.com/commodityinsights/PlattsContent/ assets/ files/en/our-methodology/methodologyspecifications/low\_carbon\_gas.pdf



Figure 3. Average spot prices of certificates in 2022 and theoretical share of average production costs

#### 3. Certificates for biomethane produced exclusively from waste are traded at higher prices.

Average "waste RGGO" in the U.K. was assessed by Argus to be €12.8/MWh on average in 2022, while energy crop based RGGO was assessed at €8.6/MWh. Manure-based certified biomethane GO in Denmark hit a very high price of €70/MWh in 2022, covering much the average production costs as reported by BIP.

	€/MWh	Share of production cost
Average Crop RGGO in the U.K. (Argus)	8.6	10.2%
Average Waste RGGO in the U.K. (Argus)	12.8	15.2%
Average Waste GO in DK (Argus)	24.2	28.8%
Average Manure-based GO in DK (Platts)	70.0	83.3%

Figure 4. Average certificate prices for waste-based and manure-based biomethane (2022)

4. Based on price assessments by Platts, the total value of the national GO markets is estimated to be beyond €80 million euro in 2022.

Total value of the market in 2022	Average price (€/MWh)	Certificates issued in 2022	Total value (€)
United Kingdom - Average RGGO Spot Price (Platts)	23.0	3.900.000	89.700.000
Netherlands - Average GO Spot Price (Platts)	41.6	2.068.182	86.036.371
Denmark - Average GO Spot Price (Platts)	41.6	6.900.000	287.040.000

Figure 5. Estimated total value of the certificate market in UK, Netherlands and Denmark in 2022<sup>7</sup>

<sup>&</sup>lt;sup>7</sup> Sources: Plaats, Green Gas Certificate Scheme, Energinet (Danish issuing body for gas GO), Verticert (Dutch issuing body for gas GO).

#### 2. Demand-side public support relying on certificates drives additional production capacity

Public support for biomethane/RNG demand usually relies on certificates of origin/sustainability. In some countries, this demand-side support has been instrumental to the growth of the biomethane market. A location-based only approach in international GHG emission reporting frameworks *would create a mismatch with these regulatory incentives*. Companies would not be able to make progress on their decarbonisation commitments – according to the GHGP and the SBTi – despite using the compulsory certificates according to the local regulation (driven by the EU legislation).

#### Tax exemption in Sweden

A tax exemption for biomethane consumption in Sweden drove an increasing transfer of Danish biomethane certificates.

- In Sweden, biomethane was exempted from carbon and excise duty from 2011 to 2023 for transport and heat production (including CHP). Natural gas as a motor fuel was exempted from carbon tax only. These measures sustained a strong move towards biomethane in road freight transport, coaches and buses, so much so that more than 95% of gaseous fuels in transport was actually biomethane in 2022.
- Biomethane production started in Sweden in the 2000's. From 2011, a tax exemption considerably expanded the market for biomethane, especially in the transport sector, contributing to a 80% production growth in production over 7 years (2011-2017, see Figure 6). Biomethane production in Sweden was not supported by any other means, except some investment subsidies, therefore the demand drive created by the tax exemption led to imports of biomethane from Denmark as soon as the Danish production was significant enough and could be traced by means of certificates. In Denmark, biomethane production began in 2012 but markedly increased only from 2015 (see Figure 6).
- In Denmark, transmission grid operator Energinet set-up a voluntary registry of certificates of origin in 2011 and has operated it since then. Biomethane's green value was thus recognised very early in the emergence of this new national market. A direct link between the export of Danish biomethane to Sweden and the tax exemption is clear in the number of certificates exported to Sweden according to Registry of Certificates of Origin (Guarantees of Origin from 2021) (see Figure 7)<sup>8</sup>.



Figure 6. Danish and Swedish biomethane production (2011-2021). Source: European Biogas Association.

<sup>&</sup>lt;sup>8</sup> Energinet now operates a government-mandated registry of Guarantees of Origin based on the Renewable Energy Directive 2018/2001. Energinet entered into bilateral agreements with other issuing bodies in Europe, for instance with German DENA's voluntary biogas registry in 2017, which created new marketing opportunities for producers.



Figure 7. Number of certificates of origin sold. Source: Energinet<sup>9</sup>

#### **Compliance markets in Germany**

In Germany, regulatory programs based on certificates led to additional production capacities.

On one hand, in 2015, German motor fuel suppliers came under an obligation of achieving GHG reduction of their fuel mix, instead of an renewable energy obligation. The GHG reduction obligation increases each year (see Figure 8). Failure to comply results in penalties (€600/tCO<sub>2</sub>). The German transport sector is also under the national Emission Trading Scheme. On the other hand, the EU's Renewable Energy Directive 2018/2001<sup>10</sup> rewards the avoidance of GHG emissions from manure management through anaerobic: the higher GHG emissions savings achieved by using manure is included in the calculation of the climate performance of biomethane and is certified by recognised schemes.



Figure 8. Increasing GHG emission reduction for German motor fuel suppliers. Source: German Biogas Association

This has progressively led to increasing consumption of German biomethane in the transport sector (see Figure 9 and Figure 10). 1,168 GWh of the biomethane produced in 2022 was used as transport fuel, representing 9% of the total production in that year. In comparison, only 380 GWh biomethane was used in transport in 2017 and 884 GWh in 2020.

<sup>&</sup>lt;sup>9</sup> The numbers are based on cancelled guarantees of origin in Energinet's registry. Statistics updated with data covering up to and including October 31, 2023.

<sup>&</sup>lt;sup>10</sup> Published in the EU Official Journal in December 2018, with a transposition deadline in Member States' legislation by 30 June 2021.



*Figure 9.* Consumption of biomethane in German per end-use. Source: German Biogas Association.

Year	Biomethane Feed-in [GWh]	Fuel utilisation [GWh]
2022	10,580	1,168
2021	10,395	1,062
2020	10,285	972
2019	10,167	700
2018	10,410	389
2017	10,220	380
2016	9,690	379



A second consequence has been the upward price of certificates of manure-based biomethane issued by the voluntary register DENA's Biogas Register (see Figure 2).

As a result, manure-based biomethane production plants have become more financially attractive. While the number of new biomethane plants commissioned each year is low since 2017 (Figure 11), most of these new plants are based on the digestion of manure and waste<sup>11</sup>.



Figure 11. Consumption of biomethane as a motor fuel in German (2016-2022). Source: German Biogas Association.

<sup>&</sup>lt;sup>11</sup> According to the German Biogas Association.

# **3.** End-use sectors rely on biomethane certificates to decarbonise their energy consumption: Sectoral cases

COMPANY OF THE PULP AND PAPER INDUSTRY		
<b>1.</b> Use of the GHG Protocol for the accounting of emissions	"[The company is] committed to a carbon reduction target using the Science Based Target Initiative (SBTi). The SBTi uses the GHGP as the reporting framework and for defining what are valid emissions to be reported under Scope 1, including if market-based reporting can be used to achieve their targets."	
<b>2.</b> Plans to procure biomethane from the gas grids as a decarbonisation solution	"They are interested in investing in new biomethane production which could use some of the paper production wastes/residues as feedstock and mean they had a source of biomethane to use for heat and power or transport fuel in their operations. In order for the project to be viable it would need to be built off site where there was land availability and planning permission. Being an energy intensive industry, onsite locations are potentially already occupied with other decarbonisation projects. They also need to inject into the grid to ensure a security of off take and to access government support for the production."	
<b>3.</b> Need for market-based approach to reporting	"Considering they will inject into the grid they need to be confident that they can purchase this biomethane via GO and/or PoS methods and that it can be reported for both voluntary and compliance reasons e.g.:	
	<ul> <li>EU ETS –to show a reduction in emissions (this is allowed in some member states but not others).</li> </ul>	
	<ul> <li>Transport Subsidy/Support – to access markets for biofuel tickets across the EU.</li> </ul>	
	<ul> <li>Voluntary Carbon Targets (with links to the EU ESRS rules) - they currently have massive uncertainty around the rules because of the changes being proposed to the GHGP."</li> </ul>	
<b>4.</b> Perceived Risks associated with a location-based only approach in the GHG Protocol for biomethane	"With this kind of internal conflict, they will be delayed or will not be able to make any positive decision to invest in this additional biomethane production. It will also be unlikely that they would source biomethane on the open market from existing or future plants developed by others."	

COMPANY OF THE BEVERAGE INDUSTRY		
<ol> <li>Use of the GHG Protocol for the accounting of emissions</li> </ol>	<ul> <li>The company has set the ambition to reach Net Zero by 2040. This includes a near-term science-based target to reach Net Zero in Scopes 1 &amp; 2 by 2030. Our 2022 global baseline for Scope 1 and 2 emissions are as follows: <ul> <li>Scope 1: 1,2 million tons CO<sub>2</sub>e</li> <li>Scope 2: 0,5 million tons CO<sub>2</sub>e</li> </ul> </li> </ul>	

2. Plans to procure biomethane from the gas grids as a decarbonisation solution	"Most of our Scope 1 emissions (70%) arise from the thermal energy required for beverage production and distribution. While we have established ambitious roadmaps to pinpoint the optimal renewable heat solutions, in many markets, we encounter significant cost and technical challenges in accessing these solutions. Biomethane has been recognized as a pivotal sourcing solution to help decarbonise our breweries and other production and logistics sites this decade. In certain markets, it stands as the most feasible solution to achieve our goals with the necessary scale and urgency. Planned investments by the company include entering into long-term thermal purchase agreements (TPAs) with off-site biomethane facilities. The success of these investments will hinge on our ability to use renewable gas certificates to make a legal claim to this off-site biomethane generation."
<b>3.</b> Need for market-based approach to reporting	Such investments are expected to lead to substantial reductions in Scope 1 emissions. As a case in point, the French subsidiary entered into a biomethane supply contract, backed by Guarantees of Origin, from 2022 to 2024 which is projected to result in an emissions reduction of 34,1 ktCO <sub>2</sub> e.
<b>4.</b> Perceived Risks associated with a location-based only approach in the GHG Protocol for biomethane	Without this sourcing option, the French subsidiary would face significant decarbonisation setbacks in this decade.

#### About the EBA

The European Biogas Association is the voice of renewable gas in Europe. Founded in February 2009, the association is committed to the active promotion of sustainable biogas and biomethane production and their use across the continent. The EBA today counts on a wellestablished network of 290 national organisations, scientific institutes and companies from Europe and beyond. <u>www.europeanbiogas.eu</u>

#### About ERGaR

The European Renewable Gas Registry is a Brussels-based association that aims at enabling cross-border transfers of certificates for renewable gases. Today we represent 34 members from 13 European countries and from a wide range of activities in the gas sector, such as renewable gas registries and associations, energy commodity traders and gas DSOs/TSOs. ERGaR operates the ERGaR CoO Scheme, which facilitates cross-border transfers of gas Guarantees of Origin as well as other types of renewable gas certificates. We also strive for ERGaR to become a Europe-wide recognised organisation for administering the mass balancing of biomethane distributed along the European gas network. www.ergar.org

#### **About RNG Coalition**

The Coalition for Renewable Natural Gas is the non-profit association providing public policy advocacy and education for the sustainable development, deployment, and utilisation of renewable natural gas. RNG Coalition membership is comprised of 380+ leading companies, municipalities, ports and airports, colleges, and universities throughout the United States and Canada. <u>www.rngcoalition.com</u>

#### **About WBA**

The World Biogas Association is the global trade association for the biogas, landfill gas and anaerobic digestion sectors, dedicated to facilitating the capture, treatment and recycling of the 105bn tonnes of methane-emitting organic wastes generated by humans every year through biogas. We seek to support all organisations working in the biogas industry at the international level across the world to achieve this, including: national associations; biogas operators and developers; supply chain; water companies; the agricultural sector; waste companies; and academic & research institutions.

www.worldbiogasassociation.org



European Biogas

Association



