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Eidgenössisches Departement für Umwelt, Verkehr, Energie und  
Kommunikation UVEK

**Bundesamt für Energie BFE**  
Sektion Energieversorgung und Monitoring

**Bundesamt für Umwelt BAFU**  
Sektion Klimapolitik

**Bericht** vom 29. Juli 2022

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# State of Play in the cross-border exchange of renewable gases in non-segregated supply chains in Europe

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**ASSMANNPEIFFER  
RECHTSANWÄLTE**

**Datum:** 29.07.2022

**Ort:** Bern

**Auftraggeber/in:**

Bundesamt für Energie BFE  
CH-3003 Bern  
[www.bfe.admin.ch](http://www.bfe.admin.ch)

Bundesamt für Umwelt, BAFU  
CH-3003 Bern  
[www.bafu.admin.ch](http://www.bafu.admin.ch)

Swisspower Green Gas AG  
Schweizerhof-Passage 7  
CH-3011 Bern  
<https://swisspower.ch/ueber-uns/swisspower-green-gas-ag/>

Verband der Schweizerischen Gasindustrie (VSG)  
Grütlistrasse 44  
Postfach  
8027 Zürich  
<https://gazenergie.ch/>

**Auftragnehmer/in:**

Hinicio  
Boulevard Saint-Lazare 4, B-1210 Brussels  
[www.hinicio.com](http://www.hinicio.com)

AGCS  
Alserbachstrasse 14-16, A-1090 Vienna  
[www.agcs.at/de](http://www.agcs.at/de)

Assmann Peiffer Rechtsanwälte  
Amalienstrasse 67, D-80799 München  
[www.assmann-peiffer.de](http://www.assmann-peiffer.de)

**Autor/in:**

Vic Peeters, Hinicio, vic.peeters@hinicio.com  
Kaja Tegtmeier, Hinicio  
Matthieu Boisson, Hinicio  
Diana Barbu, Hinicio  
Stefanie Königsberger, AGCS  
Max Peiffer, Assmann Peiffer Rechtsanwälte

**Projektbegleitung:** Marine Pasquier, BFE, [marine.pasquier@bfe.admin.ch](mailto:marine.pasquier@bfe.admin.ch)  
Tobias Scheurer, BAFU, [tobias.scheurer@bafu.admin.ch](mailto:tobias.scheurer@bafu.admin.ch)

**Begleitgruppe:** Thomas Peyer, Swisspower Green Gas AG  
Alain Schilli, Swisspower Green Gas AG  
Michael Schmid, VSG

**BFE-Vertragsnummer:** SI/200354-01

**Für den Inhalt und die Schlussfolgerungen sind ausschliesslich die Autoren dieses Berichts verantwortlich.**

**Bundesamt für Energie BFE**

Pulverstrasse 13, CH-3063 Ittigen; Postadresse: Bundesamt für Energie BFE, CH-3003 Bern  
Tel. +41 58 462 56 11 · Fax +41 58 463 25 00 · [contact@bfe.admin.ch](mailto:contact@bfe.admin.ch) · [www.bfe.admin.ch](http://www.bfe.admin.ch)

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## Glossary

AD	Activity Data
AIB	Association Of Issuing Bodies
B&C	Book And Claim
BCS	Biofertilizer Certification Scheme
BLE	Bundesanstalt Für Landwirtschaft Und Ernährung
BMCS	Biomethane Certification Scheme
CEN-EN	European Committee for Standardization
CHP	Combined Heat And Power
CIB	Consorzio Italiano Biogas
CIC	Certificati Di Immissione In Consumo
CoO	Certificate Of Origin
COP	Conference of the Parties
CPB	Certificat De Production De Biométhane
dena	Deutsche Energie Agentur
DVS	Data Verification Statement
EAG	Erneuerbaren Ausbau Gesetz
EC	European Commission
EECS	European Energy Certification System
EEG	Erneuerbare Energien Gesetz
EF	Emmission Factor
ERGaR	European Renewable Gas Registry
ETS	Emissions Trading System
EU	European Union

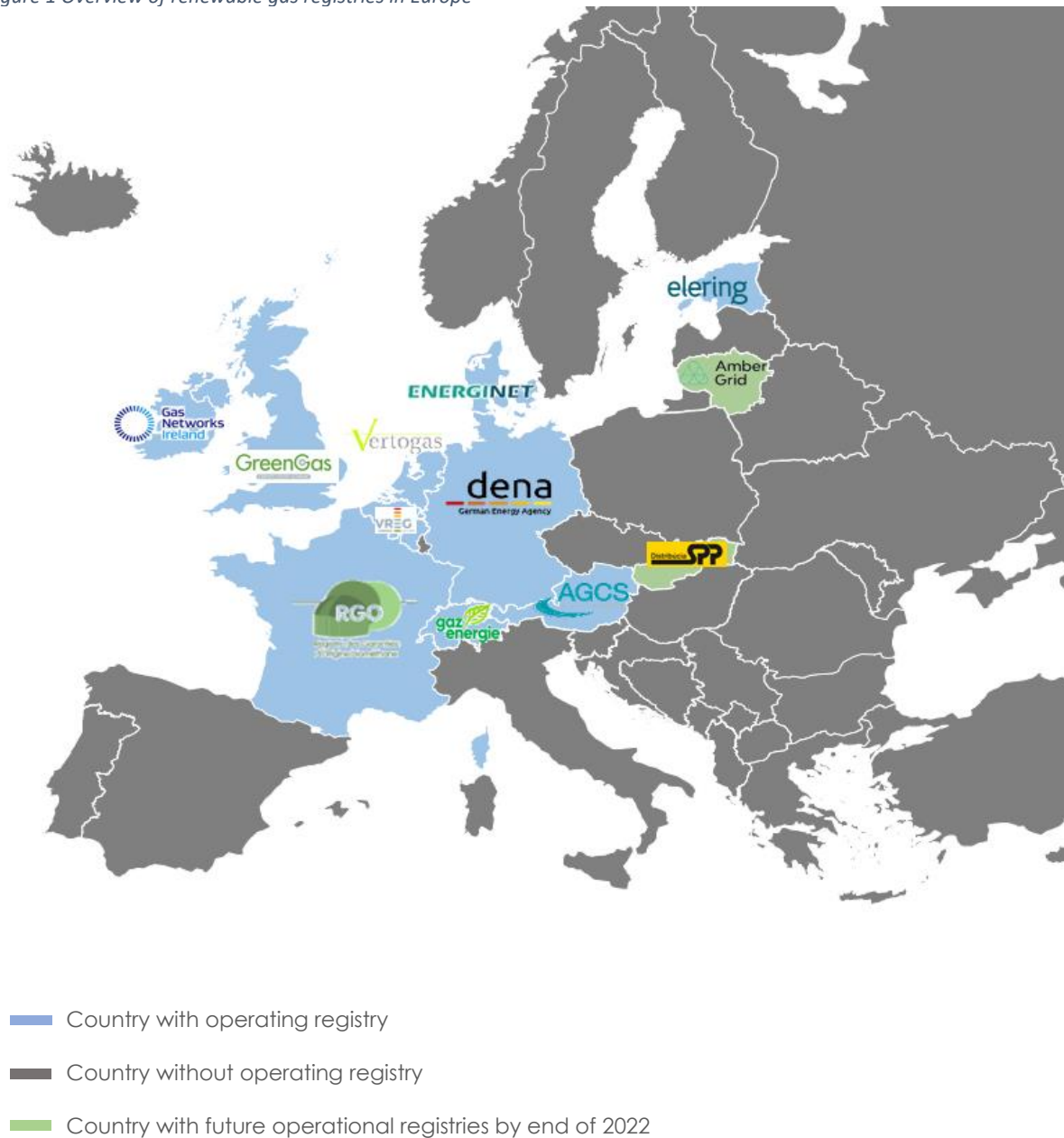
FIP	Feed in Premium
FIT	Feed-In-Tariff
GGCS	Green Gas Certification Scheme
GHG	Greenhouse Gas
GOs	Guarantees Of Origin
GRDF	Gaz Réseau Distribution France
GSE	Gestore Servizi Elettrici
HBE	Hernieuwbare Brandstofeenheid
IEA	International Energy Agency
IPCC	Intergovernmental Panel On Climate Change
ISCC	International Sustainability And Carbon Certification
MB	Mass Balance
MS	Member State
NaBiSy	Nachhaltige-Biomasse-Systeme
NDRHI	Non-Domestic Renewable Heat Incentive
NG	Natural Gas
NIR	National Inventory Report
ÖSG	Ökostromgesetz
OTC	Over The Counter
PoS	Proof Of Sustainability
RED II	Renewable Energy Directive II
RFNBO	Renewable Fuels Of Non-Biological Origin
RGGO	Renewable Gas Guarantees Of Origin
RGO	Registre Des Garanties Des Origines Biomethane
RHI	Renewable Heat Incentive
RTFC	Renewable Transport Fuel Certificates
RTFO	Renewable Transport Fuel Obligation
SDE	Subsidieregeling Duurzame Energietransitie
SEA	Swedish Energy Agency
TSO	Transmission System Operator
UDB	Union Database



## 1. Executive summary

Renewable gas production and its cross-border ownership transfers within Europe have been increasing significantly in the past decade driven by increasingly ambitious targets set by the EU and Member States. To develop a reliable renewable gas market, certification is vital to prove the quantity and quality of renewable gases. Considering this, several market actors and European countries have established national renewable gas registries and certification bodies in the past decade. *Figure 1* displays the renewable gas registries in operation in Europe.

*Figure 1 Overview of renewable gas registries in Europe*



Since the implementation of the Renewable Energy Directive II (RED II) in 2018, a European framework for certification of renewable gas was created which defines rules and standards for certification of renewable gas that have to be implemented by the EU Member States. This was done by extending:







- The purpose of Guarantees of Origin (GOs) for consumer disclosure to gas (Article 19) and refers to CEN EN 16325 for the rules of certification of renewable gas, and
- The purpose of sustainability certification for liquid biofuels in the transport sector (Article 25) to also cover advanced transport fuels with specific sub-targets for advanced biofuels and biogas, and
- The Union target (Article 3) concerning “Member State's gross final consumption of energy” to also cover advanced biofuels.

As describe above, the purposes of the certification of renewable gas include [disclosure](#) of renewable attributes of a product to reliably inform a consumer about the share or quantity of energy from renewable sources in a supplier's energy mix or [compliance](#) with EU-targets, such as achieving a minimum renewable share in energy consumption overall and in specific sectors such as transport, as described in section 3.2 of this report. In order to claim the renewable aspect of energy, for either purpose, certificates must be issued.

[Guarantees of Origin](#) (GOs) are energy certificates for renewable electricity and renewable gas (cf. Art. 19 para. 7 lit. b RED II) and are used for disclosure purposes. GOs are administered by the [Book & Claim](#) System and issued by each Member State's mandated Issuing Body. Once issued, these documents can be traded nationally and, in some cases as described in section 4, internationally. Their purpose is consumer disclosure as they are not applicable for proving the Member State's compliance with national targets on renewable energy. To prove compliance, a [Proof of Sustainability](#) certificate is necessary. It is used to prove that the principle of [Mass Balancing](#) as well as Sustainability Criteria, defined by article 30(1) RED II , including the GHG emission savings threshold, have been fulfilled. This document was implemented to suit the purpose of compliance, originally with the biofuel quota/target of RED I and now RED II, but it can also be used on a purely voluntary basis.

The previously mentioned Book and Claim system allows electricity producers to “book” the electricity they have produced as renewable in their systems while their customers can “claim” the green value they have bought as renewable. This way, the claim on consuming renewable electricity is separated from the physical flow and clearly stated on the GO. In contrast, Mass Balancing requires physical traceability of the produced energy carrier along the whole chain of custody. This is done by keeping a physical link between the production and consumption of green energy and its consignment through the Proof of Sustainability certificate. As summarized in *table 1*, some countries use biomethane certificates for disclosure, while others use them to prove compliance with RED II targets as well. Furthermore, some countries allow to use certificates to prove EU ETS compliance, as described in section 7.2. Details on each individual country can be found in section 8.

Table 1 Country overview on use of domestic certificates

	Country	Registry	Chain of custody model	Certification purpose Disclosure (D) Compliance (C)	Certificates allowed for RED II target compliance	Certificates allowed for EU ETS compliance	Main support mechanisms for biomethane
<b>Domestic</b>	Germany		B&C MB	D+C	☑	☑	<ul style="list-style-type: none"> <li>• FIT for electricity generation</li> <li>• Renewable fuel quota</li> <li>• Blending obligation in transport</li> <li>• Tax reductions</li> </ul>
	Denmark		B&C	D+C	☑	☑	<ul style="list-style-type: none"> <li>• FIP</li> <li>• Tax exemption</li> </ul>
	United Kingdom		B&C MB- requires additional audit	D	✗	✗	<ul style="list-style-type: none"> <li>• FIT</li> <li>• Transport fuel obligation</li> </ul>
	Netherlands		B&C	D+C	☑	☑	<ul style="list-style-type: none"> <li>• FIP</li> </ul>
	France		B&C	D	✗	Under development	<ul style="list-style-type: none"> <li>• FIT</li> </ul>
	Sweden	✗	MB	D+C	☑	✗	<ul style="list-style-type: none"> <li>• Tax exemptions</li> </ul>
	Austria		B&C MB	D+C	☑	✗	<ul style="list-style-type: none"> <li>• Fit for power production</li> <li>• Biomethane (phased out)</li> </ul>
	Italy	✗	✗	D	✗	✗	<ul style="list-style-type: none"> <li>• Green certificates</li> </ul>
✗ = not possible      ☑ = possible							

Cross-border ownership transfer of renewable gas is facilitated through more than twelve existing domestic gas registries in European countries, as a governmental mandate has been given for establishing an Issuing Body for renewable gas certificates. However, there are several challenges linked to cross-border exchange of renewable gases:

- **Different actors involved:** In some countries, there are several registries for renewable gas, while in others, there are none. Registry operators range from subsidiaries of gas transmission system operators (TSOs) to operators derived from market initiatives and government bodies.
- **Different systems:** In some countries, a Mass Balancing principle is applied to prove the renewability of gas in the grid by proof of injection and withdrawal

- of renewable gas into and from the national grid, which is considered one single logistical facility. Other countries do not accept this approach.
- **Difference in certificates:** Certificates apply different data fields and different specifications of these data fields.
  - **Different purpose of certificates:** Certification is used for different purposes such as disclosure and target compliance. In Denmark, Germany and the Netherlands certificates (similar to GOs) are even used to show compliance for the EU ETS.
  - **Different application purposes are covered by different pieces of legislation:** Often responsibilities lie within different ministries or on EU level with different Directorate Generals. For example, energy lies with DG ENER while biofuels are with DG CLIMA.
  - **Different application purposes pose different quality criteria on the energy carriers:** For example, target compliance requires sustainability certification and mass balance while consumer disclosure does not have these requirements.
  - **Different stages of development for Issuing Body of GOs for renewable gas:** Several EU Member States have yet to implement an Issuing Body for biomethane GOs. Meanwhile, there is only one country that has established a hydrogen GO Issuing Body, namely Vertogas in the Netherlands.
  - **Lack of IT interfaces and standard communication protocols:** Domestic registries are historically developed independently, satisfying needs for national subsidy schemes and certification purposes, resulting in a lack of (standardization of) communication protocols between registries. This is being tackled by several international organizations.

This lack of standardization and harmonization across European renewable gas registries induces a risk of:

- **Double counting:** Several countries may acknowledge and consider the same amount of renewable gas in their energy statistics. **Potential remedy:** To avoid such double counting, exporting countries shall cancel the environmental benefits of their domestic production once it is exported and to allow counting towards another country's targets. Or importing countries may not claim the environmental benefits and not recognize the imported energy as renewable.
- **Double marketing:** Several producers, consumers or intermediaries claim the environmental benefits of the same amount of renewable gas. **Potential remedy:** To avoid this, only the end-user that cancels the certificate may claim the environmental benefit of the energy.
- **Double subsidies:** Several domestic schemes of supporting and acknowledging green energy may be applicable to the same quantity of green energy. This induces a risk of fraudulent activities in international transactions for example to benefit from domestic support schemes in different countries. **Potential remedy:** To avoid this, there should be interfaces between the schemes or the schemes should implement a cooperation agreement which allows them to exchange data and information on a regular basis.

This study has concluded that a harmonized and well-aligned European system for ownership transfer of renewable gas certificates can help avoid double counting, double marketing and double subsidies and is deemed necessary in achieving a robust system.

For an integrated Europe-wide renewable gas market which reliably facilitates higher trade volumes in the future, **renewable gas production volumes need to increase and Issuing Bodies and gas registries must continue to be established and developed. A holistic (European and national) legal framework for renewable gas, the standardization of certificates (and their quality requirements) and harmonization of business processes are prerequisites to achieve a higher market uptake.**

Table 2 shows which European countries are currently (i.e., June 2022) involved in cross-border exchange of renewable gas certificates and recognize imported certificates for disclosure. Today, imported certificates cannot be used for RED II target compliance yet as per RED II, a *Union Database (UDB)* should be put in place to ensure transparency and traceability of renewable fuels. While Member States will be allowed to continue to use or establish national databases, those national databases should be linked to the Union database, in order to ensure instant data transfers and harmonization of data flows to avoid double counting. The details of the UDB will be defined in the Implementing Act for Voluntary Schemes for Gaseous Value chains, which is still under development. Following the publication of this Implementing Act, the IT Infrastructure of the UDB will still have to be implemented, hence the finalization of the UDB is not expected before end of 2023.

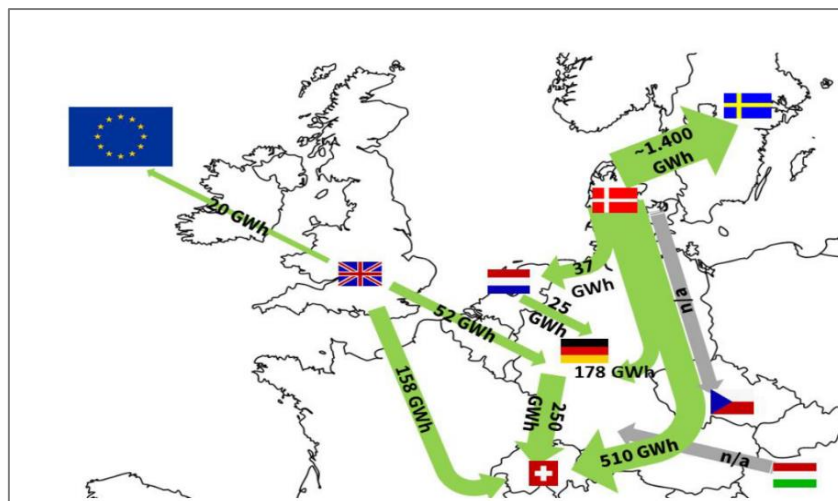
Table 2 Country overview on possibility of cross-border trade and subsequent use of imported certificates

	Country	Possibility to engage in cross-border exchange of certificates			Use of imported certificates			
		Import of certificates	Export of certificates	Trading partners	Certificate can be used for disclosure	Certificates can be used for EU ETS compliance	Certificates can be used for RED II target compliance	Certificates can be used to receive support
<b>Cross-border</b>	Germany	☑	☑	ERGaR + DK+SE	☑	☑	✗	✗
	Denmark	✗	☑	SE, CH, DE	N.A	N.A	N.A	N.A
	United kingdom	☑	☑	ERGaR	☑	✗	✗	✗
	Netherlands	✗	☑	ERGaR	N.A	N.A	N.A	N.A
	France	✗	✗	N.A	N.A	N.A	N.A	N.A
	Sweden	☑	☑	DK+DE	☑	✗	✗	☑
	Austria	☑	☑	ERGaR	☑	✗	✗	✗
	Italy	✗	✗	N.A	N.A	N.A	N.A	N.A

✗ = not possible      ☑ = possible      N.A = not applicable

The largest exporters of biomethane today are Denmark, Germany and the United Kingdom while Sweden and Switzerland are the largest importers, as shown in figure 2. This is mainly driven by (energy) tax exemptions that can be achieved for the consumption of biomethane in Sweden. In Switzerland, the import is mainly driven by high demand in the voluntary market in combination with low domestic production. Many European countries such as France and Belgium are not involved in cross-border exchange (yet).

Figure 2 Cross-border exchange of renewable gas certificates through non-segregated supply chains in 2020



Source: dena

With the purpose of facilitating this exchange, several organizations created initiatives to standardize certificates. In the past, many of these initiatives took the form of bilateral agreements between registries, for example, the Germany – Austria bilateral agreement between the registries of dena and AGCS. However, developing such bilateral agreements is time-intensive, especially the implementation of several bilateral agreements by one registry operator, while more European countries and market participants want to engage in cross-border exchange. To avoid each registry having to develop its own bilateral agreements, there are several organizations - such as AIB, CertifHy and ERGaR - that have, or are currently in the process of, defining rules and creating a standardized process that would facilitate this exchange.

Once the exchange has taken place, the renewable gas attributes must be tracked in order to check compliance with the overarching regulation, RED II. The link between renewable gas certificates and emissions reporting under the EU Emissions Trading System (ETS) and the National Inventory Reports (NIR) under guidelines of the Intergovernmental Panel on Climate Change (IPCC) is therefore highly relevant in this context. **Today, it is not possible to include volumes of imported renewable gas certificates with a low emission factor for emission reporting purposes within the National Inventory Reports within the framework of the UNFCCC.** This is because emission reporting is based on a territorial principle, restricting reported data to national activities as captured within national energy statistics. Imports of renewable gas typically do not enter these statistics as they are based on physical flows and typically rely on data of the customs authorities, which is based on physical flows, too. This leads to a purely physical approach, under which green gases are only considered "green", when green molecules are combusted.

The current lack of harmonization on a European level is a major defining factor in the cross-border trade of ownership of certificates. The country level differences contribute to several issues within the system, and the opportunity of harmonizing trade presents clear benefits. Furthermore, in light of the ambitious RED II targets, an unified system can help countries achieve their national renewable energy goals and fulfil their obligations across all sectors of production and consumption.

## 1.1 Zusammenfassung

Die Erzeugung von Gas aus erneuerbaren Energien und der grenzüberschreitende Handel der damit verbundenen Zertifikate haben in den letzten zehn Jahren innerhalb Europa erheblich zugenommen, was auf die zunehmend ehrgeizigen Ziele der EU und der Mitgliedstaaten zurückzuführen ist. Um einen zuverlässigen Markt für Gas aus erneuerbaren Energien zu entwickeln, ist eine Zertifizierung zum Nachweis der Menge und Qualität von Gas aus erneuerbaren Energien unerlässlich. In Anbetracht dessen haben mehrere Marktakteure und europäische Länder in den letzten zehn Jahren nationale Register für erneuerbare Gase und Zertifizierungsstellen eingerichtet. Abbildung 1 zeigt die Register für erneuerbare Gase, die es in Europa gibt.

Figure 1 Überblick über die Register für erneuerbare Gase in Europa



Mit der Umsetzung der Erneuerbare-Energien-Richtlinie II (RED II) im Jahr 2018 wurde ein europäischer Rahmen für die Zertifizierung von erneuerbarem Gas geschaffen, der



Regeln und Standards für die Zertifizierung von erneuerbarem Gas definiert, die von den EU-Mitgliedstaaten umgesetzt werden müssen. Dies geschah mittels folgenden Punkten:

- Der Zweck von Herkunftsnachweisen (HKNs) für die Verbraucherinformation wurde auf Gas erweitert (Artikel 19) und verweist auf CEN EN 16325 für die Regeln der Zertifizierung von erneuerbarem Gas, und
- Der Zweck der Nachhaltigkeitszertifizierung wurde auf flüssige Biokraftstoffe im Verkehrssektor (Artikel 25) erweitert, um auch fortschrittliche Verkehrskraftstoffe mit spezifischen Unterzielen für fortschrittliche Biokraftstoffe und Biogas zu erfassen, und
- Das Unionsziel (Artikel 3) für den "Bruttoendenergieverbrauch der Mitgliedstaaten" wurde etabliert, welches auch fortschrittliche Biokraftstoffe abdeckt.







Wie oben beschrieben, umfasst der Zweck der Zertifizierung von erneuerbarem Gas die Offenlegung der erneuerbaren Eigenschaften eines Produkt, um den Endkunden zuverlässig über den Anteil oder die Menge an Energie aus erneuerbaren Quellen im Energiemix eines Lieferanten oder die Einhaltung von EU-Zielen zu informieren, wie z. B. das Erreichen eines Mindestanteils erneuerbarer Energien am Energieverbrauch insgesamt und in bestimmten Sektoren (z.B. im Verkehrssektor). Um den Anteil an erneuerbarer Energie für beide Zwecke geltend machen zu können, müssen Zertifikate ausgestellt werden.

[Herkunftsnachweise \(HKNs\)](#) sind Energiezertifikate für erneuerbaren Strom und erneuerbares Gas (vgl. Art. 19 Abs. 7, RED II) und dienen der Verbraucherinformation. HKNs werden über das [„Book & Claim“ System](#) verwaltet und von der beauftragten Ausgabestelle des jeweiligen Mitgliedstaates ausgestellt. Einmal ausgestellt, können diese Dokumente national und, in einigen Fällen, international gehandelt werden. Ihr Zweck ist die Information der Verbraucher, da sie nicht für den Nachweis der Einhaltung der nationalen Ziele für erneuerbare Energien durch den Mitgliedstaat geeignet sind. Zum Nachweis der Einhaltung von nationalen Zielen ist ein [Nachhaltigkeitsnachweis](#) erforderlich. Er dient dem Nachweis darüber, dass das [Prinzip der Massenbilanz](#), sowie die Nachhaltigkeitskriterien gemäß Artikel 30(1) RED II, einschließlich der Schwelle für die Einsparung von Treibhausgasemissionen, erfüllt wurden. Dieses Dokument wurde ursprünglich für den Zweck der Einhaltung der Biokraftstoffquote/des Biokraftstoffziels der RED I und jetzt der RED II eingeführt, kann aber auch auf freiwilliger Basis verwendet werden.

Das bereits erwähnte „Book and Claim“-System ermöglicht es den Stromerzeugern, den von ihnen erzeugten Strom in ihren Anlagen als erneuerbar zu "buchen", während ihre Kunden den von ihnen gekauften grünen Wert des Stroms als erneuerbar "einfordern" können. Auf diese Weise wird der Anspruch auf den Verbrauch von Strom aus

erneuerbaren Energiequellen vom physischen Stromfluss getrennt und in der HKN klar ausgewiesen.

Tabelle 1 Länderübersicht über die Verwendung inländischer Zertifikate

	Land	Register	Nachweissysteme	Zweck der Zertifizierung Verbraucherinformation (V) Zielerfüllung (Z)	Zertifikate können für die Einhaltung der RED II-Ziele verwendet werden	Zertifikate können für die Einhaltung des EU ETS verwendet werden	Die wichtigsten Fördermechanismen für Biomethan
Inländische Übersicht	Deutschland		Book & Claim, Massenbilanz	V + Z	☑	☑	<ul style="list-style-type: none"> <li>• Einspeisetarif für Stromerzeugung aus Biomethan</li> <li>• Quote für erneuerbare Kraftstoffe</li> <li>• Beimischungsverpflichtung im Verkehr</li> <li>• Steuererleichterungen</li> </ul>
	Dänemark		Book & Claim	V + Z	☑	☑	<ul style="list-style-type: none"> <li>• Einspeiseprämie</li> <li>• Steuererleichterungen</li> </ul>
	Vereinigtes Königreich		Book & Claim, Massenbilanz erfordert zusätzl. Prüfung	V	✗	✗	<ul style="list-style-type: none"> <li>• Einspeisetarif</li> <li>• Transport fuel obligation</li> </ul>
	Niederlande		Book & Claim	V + Z	☑	☑	<ul style="list-style-type: none"> <li>• Einspeiseprämie</li> </ul>
	Frankreich		Book & Claim	V	✗	In der Entwicklung	<ul style="list-style-type: none"> <li>• Einspeisetarif</li> </ul>
	Schweden	✗	Massenbilanz	V + Z	☑	✗	<ul style="list-style-type: none"> <li>• Steuererleichterungen</li> </ul>
	Österreich		Book & Claim Massenbilanz	V + Z	☑	✗	<ul style="list-style-type: none"> <li>• Einspeisetarif für die Stromerzeugung aus Biomethan (auslaufend)</li> </ul>
	Italien	✗	✗	V	✗	✗	<ul style="list-style-type: none"> <li>• Green certificates</li> </ul>
✗ = nicht möglich      ☑ = möglich							

Im Gegensatz dazu erfordert die Massenbilanzierung die physische Rückverfolgbarkeit des erzeugten Energieträgers entlang der gesamten Lieferkette. Dies geschieht, indem eine physische Verbindung zwischen der Erzeugung und dem Verbrauch von Ökostrom und seiner Lieferung durch das Nachhaltigkeitszertifikat hergestellt wird. Wie in Tabelle 1 zusammengefasst, verwenden einige Länder Biomethanzertifikate zur Information von Verbrauchern, während andere sie auch zum Nachweis der Einhaltung der RED II-Ziele verwenden. Darüber hinaus erlauben einige Länder die Verwendung von Zertifikaten zum Nachweis der Einhaltung des EU-Emissionshandels.

Die grenzüberschreitende Übertragung von Eigentumsrechten an Zertifikaten für erneuerbares Gas wird durch mehr als zwölf bestehende inländische Gasregister in europäischen Ländern erleichtert, da ein staatlicher Auftrag zur Einrichtung einer Ausgabestelle für Zertifikate für erneuerbares Gas erteilt wurde. Der grenzüberschreitende Austausch von erneuerbaren Gasen ist jedoch mit mehreren Herausforderungen verbunden:

- **Verschiedene Akteure sind beteiligt:** In einigen Ländern gibt es mehrere Register für erneuerbares Gas, während es in anderen Ländern keine gibt. Die Betreiber der Register reichen von Tochtergesellschaften der Gasfernleitungsnetzbetreiber (TSO) bis hin zu Betreibern, die aus Marktinitiativen und staatlichen Stellen hervorgegangen sind.
- **Unterschiedliche Nachweissysteme:** In einigen Ländern wird das Prinzip der Massenbilanz angewandt, um die Erneuerbarkeit von Gas im Netz durch den Nachweis der Ein- und Ausspeisung von erneuerbarem Gas in das bzw. aus dem nationalen Netz zu belegen, welches als eine einzige logistische Einrichtung betrachtet wird. Andere Länder akzeptieren diesen Ansatz nicht.
- **Unterschiedliche Zertifikate:** In den Zertifikaten werden unterschiedliche Datenfelder und unterschiedliche Spezifikationen dieser Datenfelder verwendet.
- **Unterschiedlicher Zweck der Zertifikate:** Die Zertifizierung wird zu unterschiedlichen Zwecken verwendet, z. B. zur Information von Endkunden und zur Einhaltung von nationalen Zielen. In Dänemark, Deutschland und den Niederlanden werden Zertifikate (ähnlich wie HKNs) sogar zum Nachweis der Einhaltung des EU-Emissionshandelsystems verwendet.
- **Die verschiedenen Anwendungszwecke werden durch unterschiedliche Rechtsvorschriften abgedeckt:** Oft liegen die Zuständigkeiten bei verschiedenen Ministerien oder auf EU-Ebene bei verschiedenen Generaldirektionen. So fällt beispielsweise Energie in den Zuständigkeitsbereich der GD ENER, während Biokraftstoffe in den Zuständigkeitsbereich der GD CLIMA fallen.
- **Unterschiedliche Anwendungszwecke stellen unterschiedliche Qualitätskriterien an die Energieträger:** Die Einhaltung von Zielvorgaben erfordert beispielsweise eine Nachhaltigkeitszertifizierung und eine Massenbilanz, während für die Offenlegung gegenüber dem Verbraucher diese Anforderungen nicht gelten.

- **Unterschiedliche Entwicklungsstadien bei der Ausgabestelle von HKNs für erneuerbares Gas:** Mehrere EU-Mitgliedstaaten haben noch keine Ausgabestelle für Biomethan-HKNs eingerichtet. In der Zwischenzeit gibt es mit den Niederlanden nur ein Land, das eine Ausgabestelle für Wasserstoff-HKNs (Vertogas) eingerichtet hat.
- **Fehlen von IT-Schnittstellen und Standard-Kommunikationsprotokollen:** Die nationalen Register wurden in der Vergangenheit unabhängig voneinander entwickelt, um den Anforderungen nationaler Subventionsprogrammen und Zertifizierungszwecken gerecht zu werden, was zu einem Mangel an (standardisierten) Kommunikationsprotokollen zwischen den Registern führte. Mehrere internationale Organisationen befassen sich mit diesem Problem.

Dieser Mangel an Standardisierung und Harmonisierung zwischen den europäischen Registern für erneuerbare Gase birgt Risiken:

- **Doppelte Erfassung:** Mehrere Länder können in ihren Energiestatistiken die gleiche Menge an erneuerbarem Gas anerkennen und berücksichtigen. **Mögliche Abhilfe:** Um eine solche Doppelerfassung zu vermeiden, müssen exportierende Länder den Umweltnutzen eines Teils ihrer Produktion streichen, sobald dieser exportiert wird, und eine Anrechnung auf die Ziele eines anderen Landes ermöglichen. Alternativ können die importierenden Länder den Umweltnutzen nicht geltend machen und die importierte Energie nicht als erneuerbar anerkennen.
- **Doppelte Vermarktung:** Mehrere Erzeuger, Verbraucher oder Zwischenhändler beanspruchen den Umweltnutzen der gleichen Menge an erneuerbarem Gas. **Mögliche Abhilfe:** Um dies zu vermeiden, kann nur der Endverbraucher, der das Zertifikat annulliert, den Umweltnutzen der Energie geltend machen.
- **Doppelte Subventionen:** Für dieselbe Menge an erneuerbarer Energie können mehrere nationale Regelungen zur Förderung und Anerkennung von erneuerbarer Energie gelten. Dies birgt die Gefahr von betrügerischen Aktivitäten bei internationalen Transaktionen, um beispielsweise von nationalen Förderregelungen in verschiedenen Ländern zu profitieren. **Mögliche Abhilfe:** Um dies zu vermeiden, sollte es Schnittstellen zwischen den Regelungen geben oder die Gesetzgeber sollten eine Kooperationsvereinbarung treffen, die einen regelmäßigen Daten- und Informationsaustausch ermöglicht.

**Diese Studie kommt zu dem Schluss, dass ein harmonisiertes europäisches System für die Eigentumsübertragung von Zertifikaten für erneuerbares Gas dazu beitragen kann, Doppelerfassungen, Doppelvermarktung und Doppelsubventionen zu vermeiden, und dass es als notwendig erachtet wird, ein solches robustes System zu schaffen.**

Für einen integrierten europaweiten Markt für Gas aus erneuerbaren Energien, der in Zukunft zuverlässig höhere Handelsvolumina ermöglicht, müssen **die Produktionsmengen von Gas aus erneuerbaren Energien steigen und die Emissionsstellen und Gasregister müssen weiter auf- und ausgebaut werden. Ein ganzheitlicher (europäischer und**

**nationaler) Rechtsrahmen für erneuerbares Gas, die Standardisierung von Zertifikaten (und deren Qualitätsanforderungen) und die Harmonisierung von Geschäftsprozessen sind Voraussetzungen, um eine höhere Marktakzeptanz zu erreichen.**

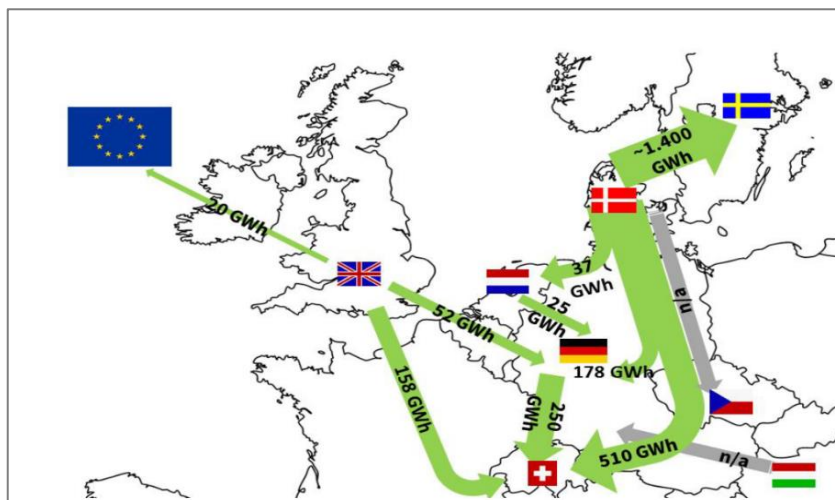
Tabelle 2 zeigt, welche europäischen Länder derzeit (Stand Juni 2022) am grenzüberschreitenden Austausch von Zertifikaten für erneuerbare Gase beteiligt sind und importierte Zertifikate für die Offenlegung anerkennen. Heute können importierte Zertifikate nicht für die Einhaltung der RED II-Ziele verwendet werden, doch gemäß RED II sollte eine Unionsdatenbank (UDB) eingerichtet werden, um die Transparenz und Rückverfolgbarkeit von erneuerbaren Kraftstoffen zu gewährleisten. Während die Mitgliedstaaten weiterhin nationale Datenbanken verwenden oder einrichten dürfen, sollten diese nationalen Datenbanken mit der Unionsdatenbank verknüpft werden, um einen sofortigen Datentransfer und eine Harmonisierung der Datenflüsse zu gewährleisten und Doppelerfassungen zu vermeiden. Die Einzelheiten der UDB werden in der Durchführungsverordnung für freiwillige Systeme für gasförmige Wertschöpfungsketten festgelegt, die sich noch in der Entwicklung befindet. Nach der Veröffentlichung dieses Durchführungsgesetzes muss die IT-Infrastruktur der UDB noch implementiert werden, daher wird die Fertigstellung der UDB nicht vor Ende 2023 erwartet.

Tabelle 2 Länderübersicht über die grenzüberschreitende Handelbarkeit und der anschließenden Verwendung importierter Zertifikate

	Land	Möglichkeit zur grenzüberschreitenden Handelbarkeit von Zertifikaten			Verwendung von importierten Zertifikaten			
		Import von Zertifikaten	Export von Zertifikaten	Akteure im Handel	Zertifikat kann für Offenlegung gegenüber Endkunden verwendet werden	Zertifikate können für die Einhaltung des EU ETS verwendet werden	Zertifikate können für die Einhaltung der RED II-Ziele verwendet werden	Zertifikate können für den Erhalt von Förderungen verwendet werden
<b>Grenzüberschreitend</b>	Deutschland	☑	☑	ERGaR + DK+SE	☑	☑	✗	✗
	Dänemark	✗	☑	SE, CH, DE	N.A	N.A	N.A	N.A
	Vereinigtes Königreich	☑	☑	ERGaR	☑	✗	✗	✗
	Niederlande	✗	☑	ERGaR	N.A	N.A	N.A	N.A
	Frankreich	✗	✗	N.A	N.A	N.A	N.A	N.A
	Schweden	☑	☑	DK+DE	☑	✗	✗	☑
	Österreich	☑	☑	ERGaR	☑	✗	✗	✗
	Italien	✗	✗	N.A	N.A	N.A	N.A	N.A
✗ = nicht möglich      ☑ = möglich      N.A = nicht anwendbar								

Die größten Exporteure von Biomethan sind heute Dänemark, Deutschland und das Vereinigte Königreich, während Schweden und die Schweiz die größten Importeure sind, wie in Abbildung 2 dargestellt ist. Dies ist vor allem auf Steuerbefreiungen von Energieprodukten zurückzuführen, die für den Verbrauch von Biomethan in Schweden gewährt werden. In der Schweiz ist der Import vor

Figure 2 Grenzüberschreitender Austausch von Zertifikaten für erneuerbares Gas über nicht segregierte Lieferketten im Jahr 2020



Quelle: dena

allem auf die hohe Nachfrage auf dem freiwilligen Markt in Kombination mit der geringen inländischen Produktion zurückzuführen. Viele europäische Länder wie Frankreich und Belgien sind (noch) nicht an einem grenzüberschreitenden Austausch beteiligt.

Um diesen Austausch zu erleichtern, haben mehrere Organisationen Initiativen zur Standardisierung von Zertifikaten ins Leben gerufen. In der Vergangenheit hatten viele dieser Initiativen die Form von bilateralen Abkommen zwischen Registerstellen, wie z. B. das bilaterale Abkommen zwischen Deutschland und Österreich, zwischen den Registern der dena und AGCS. Die Entwicklung solcher bilateralen Abkommen ist jedoch zeitintensiv, insbesondere die Umsetzung mehrerer bilateralen Abkommen durch einen Registerbetreiber, während mehr europäische Länder und Marktteilnehmer einen grenzüberschreitenden Austausch wünschen. Um zu vermeiden, dass jedes Register seine eigenen bilateralen Vereinbarungen entwickeln muss, gibt es mehrere Organisationen - wie AIB, CertifHy und ERGaR - die Regeln und ein standardisiertes Verfahren zur Erleichterung dieses Austauschs festgelegt haben oder derzeit daran arbeiten.

Sobald ein Zertifikate-Handel stattgefunden hat, müssen die Attribute für erneuerbares Gas nachverfolgt werden, um die Einhaltung der übergreifenden Verordnung der RED II zu überprüfen. Die Verbindung zwischen den Zertifikaten für erneuerbare Gase und der Emissionsberichterstattung im Rahmen des EU-Emissionshandelssystems (ETS) und der Nationalen Inventarberichte (NIR) gemäß den Leitlinien der IPCC ist daher in diesem Zusammenhang von großer Bedeutung. **Derzeit ist es nicht möglich, Mengen importierter Zertifikate für erneuerbare Gase mit einem niedrigen Emissionsfaktor für die Emissionsberichterstattung in den Nationalen Inventarberichten im Rahmen des UNFCCC zu berücksichtigen.** Dies liegt daran, dass die Emissionsberichterstattung auf einem territorialen Prinzip basiert, dass die gemeldeten Daten auf nationale Aktivitäten beschränkt, so wie sie in den nationalen Energiestatistiken erfasst werden. Importe von Gas aus erneuerbaren Energiequellen fließen in der Regel nicht in diese Statistiken ein, da sie auf physischen Strömen beruhen und sich in der Regel auf Daten der Zollbehörden

stützen, die ebenfalls auf physischen Strömen beruhen. Dies führt zu einem rein physikalischen Ansatz, bei dem grüne Gase nur dann als "grün" gelten, wenn grüne Moleküle verbrannt werden.

Der derzeitige Mangel an Harmonisierung auf europäischer Ebene ist ein wichtiger Faktor für den grenzüberschreitenden Handel mit Zertifikaten. Die Unterschiede auf Länderebene tragen zu verschiedenen Problemen innerhalb des Systems bei, und die Möglichkeit, den Handel zu harmonisieren, bietet klare Vorteile. Darüber hinaus kann ein einheitliches System angesichts der ehrgeizigen RED II-Ziele den Ländern helfen, ihre nationalen Ziele für erneuerbare Energien zu erreichen und ihre Verpflichtungen in allen Produktions- und Verbrauchssektoren zu erfüllen.

## 1.2 Résumé

Durant les 10 dernières années, la production de gaz renouvelable et ainsi que les échanges transfrontaliers au sein de l'Europe ont augmenté de manière importante, poussés par des objectifs toujours plus ambitieux imposés par l'Europe et les Etats membres. Pour développer un marché fiable du gaz renouvelable, un mécanisme de certification est essentiel pour authentifier la quantité et la qualité des produits proposés. Dès lors, plusieurs acteurs et pays Européens ont établi des registres nationaux de gaz renouvelables ainsi que des organismes agréés de certification au sein de l'Europe (Figure 1).

Figure 1 Aperçu des registres de gaz renouvelables en Europe



Depuis la mise en place de la Directive sur les énergies renouvelables II (RED II) en 2018, un cadre Européen pour la certification de gaz renouvelables fut créé, définissant ainsi



les règles et standards de certification à suivre par les Etats Membres de l'UE. RED II a notamment défini ce nouveau cadre en :

- Elargissant le cadre de l'utilisation des Garanties d'Origines (GOs) comme moyen de divulgation et de transparence pour les consommateurs de gaz (Article 19), et faisant référence au CEN EN 16325 sur les règles de certification des gaz renouvelables par des Garanties d'Origine,
- Incluant les biocarburants « avancés » dans le cadre de la certification des biocarburants liquides dans le secteur des transports, en précisant des sous-objectifs spécifiques pour les carburants « avancés » et le biogaz,
- Incluant les biocarburants « avancés » dans l'objectif de l'UE (Article 3) concernant la consommation d'énergie brute finale des Etats membres.






Comme précédemment décrit, les objectifs de la certification des gaz renouvelables portent sur la divulgation des aspects renouvelables d'un produit en vue d'informer de manière fiable un consommateur à propos de la proportion ou de la quantité d'énergie provenant de sources renouvelables dans le mix énergétique d'un fournisseur, ou sur la conformité ou non d'un produit avec les objectifs Européens; comme par exemple la proportion minimum d'énergie renouvelable utilisée de manière globale, ainsi que dans certains secteur d'activités comme le transport (cf partie 3.2). En vue de réclamer de l'aspect renouvelable de l'énergie utilisée, des certificats doivent être émis, quel que soit l'objectif initial.

**Les Garanties d'Origines (GOs)** sont des certificats d'énergie pour l'électricité renouvelable et le gaz renouvelable (cf. Art. 19 para. 7 lit. b RED II) et sont utilisés pour la publication et la déclaration d'informations. Les GOs sont gérées par un système de **Book & Claim** et sont décernées par des organismes de certifications mandatés par chacun des Etats membres. Une fois décernés, ces documents peuvent être vendus nationalement, voire internationalement dans certains cas (cf section 4). Leur utilisation sont cependant contenue à des seules fins de divulgation et d'identification pour le consommateur. Ils ne sauraient être utilisés pour prouver une quelconque conformité des Etats membres envers leurs objectifs nationaux sur les énergies renouvelables. Pour prouver une telle conformité, un certificat de **Preuve de Durabilité** est nécessaire. Celui-ci est utilisé pour prouver que le principe de **bilan massique** ainsi que les Critères de Durabilité, définis par l'article 30(1) RED II incluant les paliers de réductions d'émissions de GES, ont bien été respectés. Initialement, ce mode de certification fut mis en place pour servir cet objectif de conformité, en lien avec les quotas de biocarburant fixés par la RED I (maintenant RED II), mais peut également être utilisé dans une approche purement volontaire.

Le système de Book and Claim précédemment évoqué permet aux producteurs d'électricité de « déclarer » (book) et d'identifier l'électricité qu'ils ont produites comme renouvelable, tandis que les consommateurs peuvent « revendiquer » (claim) le caractère renouvelable du produit qu'ils ont acheté en tant qu'énergie renouvelable. Ainsi, la déclaration sur la consommation d'électricité renouvelable est séparée du flux

réel d'approvisionnement, et cela est clairement spécifié sur la GO. A l'inverse, le bilan massique requiert une traçabilité physique du vecteur d'énergie produit tout au long de la chaîne logistique. Ceci est fait en gardant un lien physique entre la production et la consommation d'énergie verte, et par la livraison au travers de certificats de Preuve de Durabilité (proof of sustainability certificate). Comme expliqué dans le tableau 1, certains pays utilisent des certificats pour le biométhane pour informer les consommateurs, tandis que d'autres les utilisent pour prouver la conformité de leurs activités avec les objectifs de la RED II. De plus, certains pays autorisent l'utilisation de certificats pour prouver une conformité au système EU-ETS (cf partie 7.2). Des détails sur chaque pays peuvent être consultés dans la partie 8.

Tableau 1 Aperçu de l'utilisation par pays de certificats nationaux

Utilisation échelle nationale	Pays	Registre	Modèle de traçabilité	Objectif certification Déclaration (D) Conformité (C)	Certificats autorisés pour conformité objectifs RED II	Certificats autorisés pour conformité EUETS	Principaux mécanismes de support pour biométhane
	Allemagne		B&C MB	D+C	☑	☑	<ul style="list-style-type: none"> <li>• FIT for electricity generation</li> <li>• Renewable fuel quota</li> <li>• Blending obligation in transport</li> <li>• Tax reductions</li> </ul>
	Danemark		B&C	D+C	☑	☑	<ul style="list-style-type: none"> <li>• FIP</li> <li>• Tax exemption</li> </ul>
	Royaume-Uni		B&C MB + audit spécifique	D	✗	✗	<ul style="list-style-type: none"> <li>• FIT</li> <li>• Transport fuel obligation</li> </ul>
	Pays-Bas		B&C	D+C	☑	☑	<ul style="list-style-type: none"> <li>• FIP</li> </ul>
	France		B&C	D	✗	En développement	<ul style="list-style-type: none"> <li>• FIT</li> </ul>
	Suède	✗	MB	D+C	☑	✗	<ul style="list-style-type: none"> <li>• Tax exemptions</li> </ul>

Les échanges transfrontaliers de gaz renouvelables sont facilités par l'existence de plus d'une douzaine de registres nationaux pour le gaz renouvelable au sein des pays Européens, qui chacun chargé une entité de délivrance de certificats de gaz renouvelables. Cependant, il y a plusieurs défis liés aux échanges transfrontaliers de gaz renouvelables :

- **Différents acteurs impliqués:** Dans certains pays, il y a parfois plusieurs registres pour le gaz

- renouvelable, tandis que dans d'autres, il n'y en a aucun. Les opérateurs de registre vont des filiales d'opérateurs de systèmes de transmission de gaz (GRT) aux opérateurs de marché en passant par des organismes gouvernementaux.
- **Différents systèmes:** Dans certains pays, un principe de bilan massique est appliqué pour prouver le caractère renouvelable d'un gaz sur le réseau via des preuves d'injection et de retrait de gaz renouvelable dans et depuis le réseau national, ce qui n'est pas accepté dans d'autres pays.
  - **Différence dans les certificats:** Les certificats contiennent des informations différentes dans des formats différents.
  - **Différents objectifs des certificats:** La certification est utilisée pour différents objectifs (divulgaration ou conformité). Au Danemark, en Allemagne et aux Pays-Bas, les certificats (comparables à des GOs) sont même utilisés pour prouver une conformité au système EU ETS.
  - **Différents objectifs d'application sont couverts par différentes législations:** Souvent, les responsabilités résident au sein de différents ministères, ou différentes Directions pour l'UE (DG). Par exemple, l'énergie est sous l'autorité de DG ENER, tandis que les biocarburants sont sous l'autorité de DG CLIMA.
  - **Différents objectifs d'application posent différents critères de qualité sur les vecteurs:** Par exemple, la conformité aux objectifs fixés requiert une certification de la durabilité et un bilan massique, tandis que la divulgation au consommateur ne présente pas tous ces requis.
  - **Différentes étapes de développement pour les organismes émetteurs de GOs de gaz renouvelables:** Plusieurs États membres de l'UE doivent encore désigner un organisme émetteur de GOs pour le biométhane. Pendant ce temps, il n'y a qu'un seul pays qui a établi un organisme émetteur de GOs pour l'hydrogène (Vertogas aux Pays-Bas).
  - **Un manque d'interfaces IT et de protocoles de communication standardisés:** Les registres domestiques sont historiquement développés de manière indépendante, satisfaisant des besoins de schémas de subventions nationaux et d'objectifs de certification, résultant en un manque dans la standardisation des protocoles de communication entre les registres. Ceci a été montré du doublet par différentes organisations internationales.

Ce manque de standardisation et d'harmonisation entre les registres de gaz renouvelables Européens induisent un risque de :

- **Double comptage:** Plusieurs pays pourraient reconnaître and considérer la même quantité de gaz renouvelable dans leurs statistiques énergétiques. **Potentiel remède:** Pour éviter un tel double comptage, les pays exportateurs ne devraient pas prendre en compte les bénéfices environnementaux de leur production domestique une fois que celle-ci a été exportée, et permettre la prise en compte de ces bénéfices pour les objectifs d'un autre pays. Ou bien, les pays importateurs pourraient ne pas revendiquer les bénéfices environnementaux et ne pas reconnaître l'énergie importée comme renouvelable.

- **Double marketing:** Plusieurs producteurs, consommateurs ou intermédiaires revendiquent les bénéfices environnementaux d'une même quantité de gaz renouvelable. **Potentiel remède:** Pour éviter cela, seul le consommateur final qui annule le certificat peut revendiquer le bénéfice environnemental de l'énergie.
- **Double subventions:** Plusieurs schémas nationaux de soutien et de reconnaissance des énergies renouvelables peuvent être appliqués à la même quantité d'énergie verte. Cela induit par exemple un risque d'activités frauduleuses dans les transactions internationales en bénéficiant de différents schémas de soutien dans différents pays. **Potentiel remède:** Pour éviter cela, il devrait y avoir des interfaces entre les schémas de soutien ou ces schémas devraient mettre en place un accord de coopération qui les autoriseraient à échanger des données et des informations régulièrement.

Cette étude a permis de conclure qu'un système Européen harmonisé pour l'échange et la vente de certificats de gaz renouvelable pourrait aider à éviter des problèmes tels que le double comptage, le double marketing et la double subvention, et qu'il était nécessaire de construire un système qui soit particulièrement robuste.

Pour qu'un marché intégré du gaz renouvelable à l'échelle Européenne puisse faciliter de manière fiable de plus gros volumes de ventes dans le futur, les volumes de production de gaz renouvelables doivent d'une part croître, et d'autre part, les organismes émetteurs ainsi que les registres de gaz doivent continuer d'être développés. Un cadre légal (Européen et national) holistique pour le gaz renouvelable, une standardisation des certificats (et des conditions requises concernant leur qualité) et une harmonisation des processus sont des prérequis pour permettre un meilleur développement du marché.

Le tableau 2 montre quels pays Européens participent actuellement (en Juin 2022) à des échanges transfrontaliers de certificats de gaz renouvelables et qui reconnaissent les certificats importés pour des fins de divulgation (disclosure purpose). Aujourd'hui, les certificats importés ne peuvent pas encore être utilisés pour prouver une conformité avec les objectifs RED II, car sous la RED II, une Union Database (UDB) devrait être mise en place pour assurer transparence et traçabilité des carburants renouvelables. Alors que les Etats membres seront autorisés à continuer d'utiliser ou d'établir des bases de données nationales, celles-ci devront être liées à l'Union Database, en vue d'assurer un transfert instantané des données et une harmonisation des flux de données pour éviter un double comptage. Les détails de l'UDB seront définis dans l'Implementing Act pour les schémas volontaires sur les chaînes de valeur des gaz, qui est actuellement toujours en cours de développement. Après la publication de cet Implementing Act, l'infrastructure IT de l'UDB devra toujours être définie et mise en place, d'où une finalisation de l'UDB qui n'est pas attendue avant fin 2023.

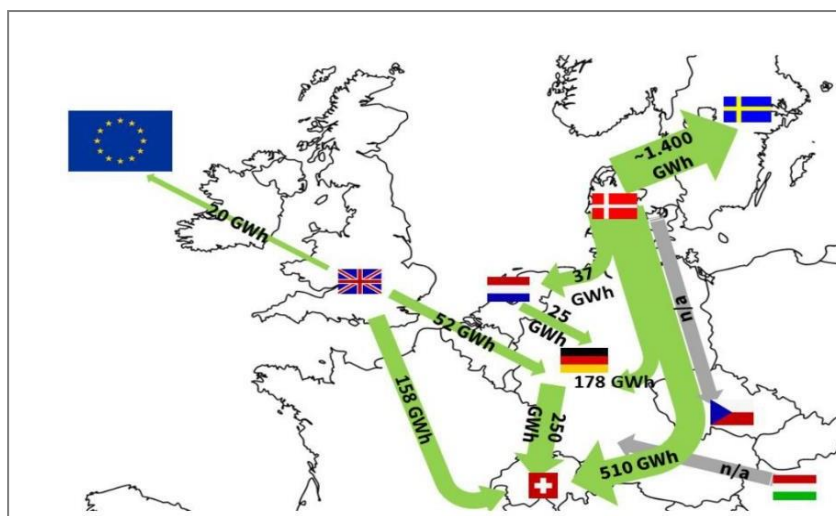
Tableau 2 Aperçu par pays sur la possibilité d'échanges commerciaux transfrontaliers et d'un usage des certificats importés

	Pays	Possibilité d'effectuer des échanges transfrontaliers de certificats			Utilisation des certificats importés			
		Importation de certificats	Exportation de certificats	Acteurs du commerce	Certificat pour des fins de divulgation	Certificats pour conformité EU ETS	Certificats pour conformité objectifs RED II	Certificats permettant soutien/subventions
Echanges transfrontaliers	Allemagne	☑	☑	ERGaR + DK+SE	☑	☑	✗	✗
	Danemark	✗	☑	SE, CH, DE	N.A	N.A	N.A	N.A
	Royaume-Uni	☑	☑	ERGaR	☑	✗	✗	✗
	Pays-Bas	✗	☑	ERGaR	N.A	N.A	N.A	N.A
	France	✗	✗	N.A	N.A	N.A	N.A	N.A
	Suède	☑	☑	DK+DE	☑	✗	✗	☑
	Autriche	☑	☑	ERGaR	☑	✗	✗	✗
	Italie	✗	✗	N.A	N.A	N.A	N.A	N.A

✗ = pas possible    ☑ = possible    N.A = pas applicable

Les plus gros exportateurs de biométhane aujourd'hui sont le Danemark, l'Allemagne et le Royaume-Uni, tandis que la Suède et la Suisse sont les plus gros importateurs (cf fig.2). Cette tendance est principalement le fruit des exemptions de taxes (énergie) qui peuvent être appliquées sur la consommation de biométhane en Suède. En Suisse, l'importation est principalement favorisée par une forte demande du marché volontaire, en lien avec une faible production domestique. Beaucoup de pays Européens comme la France et la Belgique ne sont à date pas impliqués dans de tels échanges transfrontaliers.

Figure 2 Echange transfrontalier de certificate de gaz renouvelable via des chaînes



Source: dena

Avec pour objectif de faciliter ces échanges, plusieurs organisations ont créé des

initiatives pour standardiser l'échange de certificats. Par le passé, un grand nombre de ces initiatives ont pris la forme d'accords bilatéraux entre registres, via l'exemple notamment de l'accord bilatéral Autriche-Allemagne entre les registres dena et AGCS. Cependant, développer de tels accords bilatéraux requiert beaucoup de temps, surtout en ce qui concerne la mise en place de plusieurs accords bilatéraux par un seul opérateur de registre, tandis que de plus en plus de pays Européens et d'acteurs de marché veulent s'engager dans des échanges transfrontaliers. En vue d'éviter que chaque registre ait à développer ses propres accords bilatéraux, plusieurs organisations (i.e. AIB, Certifhy et ERGaR) ont ou sont en train de définir des règles pour créer un processus standardisé qui faciliterait ces échanges.

Une fois que ces échanges ont eu lieu, les propriétés des gaz renouvelables doivent être parfaitement tracées pour rester en conformité avec une réglementation RED II dont la complexité grandit. Le lien entre les certificats de gaz renouvelables et les rapports d'émissions de gaz à effet de serre sous le système d'échange d'émissions de l'UE (ETS) et les Rapports d'Inventaires Nationaux (NIR) sous les consignes du Groupe d'experts Intergouvernemental sur l'Evolution du Climat (GIEC) est ainsi extrêmement important dans ce contexte. Aujourd'hui, il n'est pas possible d'inclure des certificats de volumes importés de gaz renouvelables ayant un facteur d'émission faible pour faire des rapports d'émissions classés NIR au sein de l'UNFCCC. La raison étant que des rapports d'émissions sont basés sur un principe territorial, restreignant de facto les données rapportées à des activités nationales, car établies selon les statistiques énergétiques du pays en question. Les importations de gaz renouvelables ne peuvent typiquement pas être prises en compte dans ces statistiques car elles sont basées sur des flux physiques reposant sur des données des autorités douanières, basées elles-mêmes aussi sur des flux physiques. Cela conduit à une approche purement physique sous laquelle des gaz verts ne sont considérés « verts » que si les molécules sont utilisées par combustion.

Le manque d'harmonisation aujourd'hui à l'échelle Européenne est un facteur déterminant pour les échanges commerciaux transfrontaliers de certificats. Les différences à l'échelle d'un pays contribuent à plusieurs problèmes importants au sein de ce système, et l'opportunités d'harmoniser les échanges commerciaux présentent de réels avantages. De plus, à la lumière des objectifs ambitieux de la RED II, un système unifié pourrait aider les pays à atteindre leurs objectifs nationaux d'énergie renouvelable, et à remplir leurs obligations au service de multiples secteurs de production et de consommation.

## 2 Introduction

This report was written by Hinicio, AGCS and AssmannPeiffer for the Swiss Federal Office of Energy (Bundesamt für Energie, BFE), the Swiss Federal Office for the Environment (Bundesamt für Umwelt, BAFU), Swisspower Green Gas AG and VSG (Verband der Schweizerischen Gasindustrie).

The goal of this report is to map the state-of-play of cross-border exchange of renewable gaseous energy carriers through non-segregated supply chains in Europe. The countries investigated are those European countries with the most developed renewable gas production industry and regulatory framework: Germany, Denmark, The Netherlands, France, United Kingdom, Austria, Italy, and Sweden. This report was elaborated based on desk research in addition to interviews with key experts on the European renewable gas sector, such as representatives of renewable gas registries, certification bodies and international bodies dealing with cross-border exchange of renewable gas.

### 2.1 Document structure

[Section 3](#) of the report introduces the most important EU regulation and terminology with regards to tracking & reporting of renewable gaseous fuels in the EU. This includes the definition of the most relevant terms, such as Guarantees of Origin, Proofs of Sustainability, Book & Claim, Mass Balance, Sustainability Criteria, etc.

[Section 4](#) and [section 5](#) present an overview on the cross-border exchange of renewable gas certificates through non-segregated supply chains in Europe and the organizations involved in cross-border ownership exchange. This covers an overview of the import and export of renewable gas for each country in the study scope, while [section 6](#) covers the state-of-play of support mechanisms.

[Section 7](#) elaborates on the European (EU ETS) and global (National Inventory Report) framework regarding emissions monitoring and the link with biomethane certificates and emissions accounting.

Lastly, [section 8](#) presents an in-depth analyses on each targeted country included in the study scope, describing the country context (registry in place, certification scheme, etc.), available support mechanisms for renewable gas and state-of-play of cross-border ownership exchange of renewable gas.

## 3. Definitions and regulation

### 3.1 Introduction

This section describes the relevant regulatory framework in Europe with regards to renewable gas. The focus lays on the Renewable Energy Directive II (RED II), as this is the most important directive for renewable energy in Europe. It sets targets on the use of renewable energy in addition to dictating rules for the certification of that renewable energy. Furthermore, it defines important concepts, definitions, rules, and organizations that have to be implemented by all EU Member States.

### 3.2 RED II Targets

The binding targets represent the core of the RED II, as it aims at creating a European framework for energy carriers from renewable sources. Consequently, it facilitates the process of tracking production and consumption of energy.

In accordance with the RED II, renewable gas which is sustainably certified including Mass Balancing (see section 3.6) can be counted towards national targets. Alternatively, it can be claimed as renewable through the Book & Claim system for disclosure purposes, which will be further detailed in section 3.4 of this report.

RED II sets the following overarching targets:

- A Minimum of **32%** EU gross energy consumption shall come from **renewable energy sources by 2030**;
- **The Heating and Cooling sector** must reach a **1.3% annual increase** of shares of renewable energy;
- **Road and Rail transport sector** is bound to a **14% share of renewable energy by 2030**.

In the context of biofuels, including biogas/biomethane under RED II, fulfillment of the sustainability criteria, GHG emissions savings (Article 29(2) to (7)), and mass balancing are to reach eligibility for accounting towards targets. To prove compliance with these criteria, a Mass Balancing system must be used by economic operators to receive a Proof of Sustainability, defined in article 30(1) RED II. For cross-border trade, certificates must additionally be registered in the Union Database, which is further described in section 0. Moreover, the share of biofuels and liquid biofuels from food and feed crops used in transport shall be no more than one percentage point higher than the national share of said fuels in 2020. Their maximum consumption in this sector capped at 7%.

### 3.3 Certification Purpose

Certification can be used for the following three purposes:

- **Disclosure** of renewable attributes of a product to reliably inform a consumer about the share or quantity of energy from renewable sources in a supplier's energy mix. In practice, this constitutes the share of renewable and fossil energy to be disclosed by the energy supplier on the annual energy bill. According to RED II, Guarantees of Origin (GOs) are used for demonstrating disclosure.
- **Compliance** with EU-targets, such as achieving a minimum renewable share in energy consumption overall and in specific sectors, as described in section 3.2. Certification for target compliance is necessary in order to qualify for tax exemptions, quota obligations or emission-reduction obligations.
- **Monitoring** the share of renewable energy in order to assess whether countries need to increase the domestic share of renewable energy (RED II) or to reduce the domestic or company GHG-emissions according to international targets.



This is used for management and controlling purposes regarding the fulfillment of national and international targets.

### 3.4 Guarantee of Origin

Guarantees of origin (GOs) are an energy certificate for renewable electricity and renewable gas (cf. Art. 19 para. 7 lit. b RED II). GOs are administered by the Book & Claim System and issued by each Member State's mandated Issuing Body. Once issued, these documents can be traded nationally and internationally. Their purpose is [consumer disclosure](#) as they are not applicable for proving the Member State's compliance with national targets on renewable energy as per Art.55 RED II and Art 19 (2) RED II.

With the implementation of RED II, some changes have been made to the GO system. RED I allowed Member States to decide whether they would recognize GOs from Non-EU countries and the Economic European Area. Once RED II was implemented, Member States may recognize GOs only from non-EU Member States, with which the European Union has concluded a specific agreement on the mutual recognition of GOs, as per Art 19 (11) RED II. Currently, this only includes countries of the European Economic Area and of the European Energy Community (Switzerland is not included). Furthermore, the system is with RED II applicable not only to renewable electricity, but also to renewable gas, hydrogen, heating and cooling.

In line with EECS, national issuing bodies for power have enabled automation-supported cross-border ownership transfers of national Guarantees of Origin, enabling the connection of national markets into one common European market.

AIB has recently adapted its EECS rules to cover gas Guarantees or Origins as well.

In June 2021, ERGaR European Renewable Gas Registry aisbl has launched the ERGaR Certificate of Origin Scheme which enables cross-border ownership transfers of renewable gas certificates. ERGaR has adopted the term CoO (Certificate of Origin), to describe documentation of renewable gas injections, that may hold the same information as a GO under Article 19 RED II but may not have been created by a national biomethane registry who has been appointed as a "issuing body" via governmental mandate. A CoO may also include additional information compared to a GO, for example information on greenhouse gas emission intensity or a PoS issued by complying with the rules of a recognized voluntary scheme. If interacting national registries do hold the governmental mandate as issuing body for Guarantees of Origin, they may transfer gas Guarantees of Origin using this system.

### 3.5 Proof of Sustainability

Proof of Sustainability (PoS) is a certificate type. It is used as a vehicle to proof that the principle of Mass Balancing as well as sustainability criteria, including the GHG emission mitigation value, have been fulfilled. This certificate type / document was implemented to suit the purpose of [compliance, originally with the biofuel quota/target of RED I and now RED II](#), while it can also be used on a purely voluntary basis. It is also extended to prove compliance with the Union Target (Art 3 RED II) and for EU ETS purposes, since the Monitoring and Reporting Regulation refers to the requirement of fulfilling sustainability

criteria according to RED II. Since this certificate type and the underlying mass balancing principle is considered to be the highest possible standard of certification and has thus gained popularity recently, it is also more and more used to fulfil voluntary purposes as agreed between market parties or applied by voluntary standards (e.g., the ISCC+ scheme which does neither hold recognition under RED I nor under RED II by the European Commission).

This certificate type is used for gaseous and liquid biomass fuels as well as renewable fuels of non-biological origin (RFNBOs). This system is applied by the Economic Operators (cf. Art. 30 para. 1 RED II), who shall apply certain standards regarding auditing and control of the production, transportation and consumption of energy carriers. Economic Operators may also rely on Voluntary Schemes recognized by the European Commission in order to certify their production (cf. Art. 30 para. 4 RED).

Similar to GOs, the PoS system has also changed due to the coming of effect of RED II. Furthermore, the legal uncertainties regarding gaseous fuels in the grid were clarified by the RED II (123), as the RED I referred only to liquid fuels. According to RED II article 123, a Mass Balance system and the implementation of the Union database intend to address issues regarding appropriate accounting and avoidance of double counting of biomethane across borders. The directive states that the European interconnected gas grid is considered one integral Mass Balancing system and gaseous fuels produced and/or consumed off the grid or transported through local distribution systems will be considered as separate Mass Balancing systems.

### 3.6 Book & Claim

The Book & Claim (B&C) model functions based on the concept of a renewable claim being separated from the physical flow of an energy carrier. For the past 20 years, the Book & Claim system has been used for booking and claiming the renewable value of electricity. As there are no physical differences between electricity produced with renewables or fossil fuels, it is not possible to track the physical attributes of electricity once injected into the grid.

To solve this problem, Book & Claim systems were developed to allow electricity producers to “book” the electricity they have produced as renewable in their systems while their customers can “claim” the green value they have bought as renewable. This way, the claim on consuming renewable electricity is separated from the physical flow.

A comparable challenge exists for renewable gas too, as once it is injected into the gas grid, the renewable and fossil parts are blended, and the renewability can no longer be distinguished. Therefore, Book & Claims systems can also be interesting for renewable gas, however, there are several difficulties regarding the recognition of renewable gas transported across borders through the interconnected European gas grid, which is elaborated in section 4.2.

The Book & Claim system is applied on transfers (nationally and cross-border) of Guarantees of Origin for which Renewable Energy Directive I provided the legal framework in the case of electricity. Renewable Energy Directive II extends this system to

also cover hydrocarbon gas, hydrogen and heating and cooling. The European standard CEN - EN 16325 specifies requirements for Guarantees of Origin related to electricity, called Guarantees of Origin for Electricity. As is requested by Art 19 (6) RED II, the standard is currently being further developed to also cover Guarantees of Origin for hydrocarbon gas, hydrogen and heating and cooling too.

### 3.7 Mass Balance

Mass Balancing is a system commonly used for biofuels which was first implemented in accordance with Article 18 RED I. In contrast to Book & Claim, Mass Balancing requires physical traceability of the produced energy carrier along the whole chain of custody. This is done by keeping a physical link between the production and consumption of green energy and its "consignment" (to be understood as a defined "unit" of the energy carrier). This strict physical traceability was especially important for the production of biofuels for the transport sector to ensure actual sustainability along the whole chain of custody going beyond the European Union. With this concept, the EU works on effectively preventing land use change measures in areas of rain forests and other/similar areas worthy of protection.

There are several gradations of Mass Balancing with varying levels of strictness, dependent on the association, certification system or application it is used for. As per RED II, Mass Balancing requirements are based on physical transactions between economic operators.

Mass balancing has to be applied at each step in the chain of custody. The "steps" within the chain of custody refer to a closed setting, which can also be understood as a "logistical facility" (or simply said "container") holding the respective energy carrier during production, transport or storage. One "consignment" is held in such a "logistical facility". As liquid biofuels are usually transported in containers via shipping and road transport, the understanding of a "consignment" for liquid biofuels is quite clear. However, when it comes to the production, transport or storage of gaseous biofuels, the understanding of their "consignments" might become more complex, since the biogenic product is blended with fossil products in the gas grid. While Europe has an interconnected gas infrastructure, its maintenance and operation is managed by different legal entities - distribution system operators, transmission system operators, gas storage operators, gas grid managers – and different grid levels exist.

The draft Implementing Regulation on Art 30 (8) RED II defines that the "sustainability and greenhouse gas emissions saving characteristics" for which a mixture of raw materials is categorized as a consignment can be used. Specific requirements need to be met for accounting within one consignment. Consequently, a consignment can be injected into and transported via the interconnected, European natural gas grid. Consequently, the European Commission allows for transport of renewable gases via the grid which includes the transport of the renewable value with regard to the Renewable Energy Directive 2018/2001 in a gas blend. Recital number 5 of the implementation regulation states that "In case of gaseous fuels, the EU interconnected grid is considered as one single mass balancing system."

Currently, there are different interpretations of the “logistical facility” or a “closed mass balancing system” in the gas sector, for example:”

- Specifically defined geographical region
- National borders
- Gas market area
- Interconnected, European gas grid

This report applies the Mass Balancing methodology, as defined by the RED II. In accordance with RED II, the Mass Balancing system allows mixing of biofuels with different sustainability characteristics, while requiring necessary information about these characteristics and the size of the consignments.

### 3.8 Difference Mass Balance and Book & Claim system

The main differences between Book & Claim (B&C) and Mass Balance (MB) Systems are graphically shown in *figure 3* and summarized in *table 3*. Within the Book & Claim system, GOs are issued at production and cancelled later on, after consumption, as they can be bought and traded independently from the physical gas. Contrary, the Mass Balancing system requires the Proof of Sustainability (PoS) and the physical product to be traded together, as they must be certified at every step in the chain of custody. Mass Balancing is closed only at the point of use of the physical product and the cancellation of the certificate.

Figure 3 Differences between B&C and MB

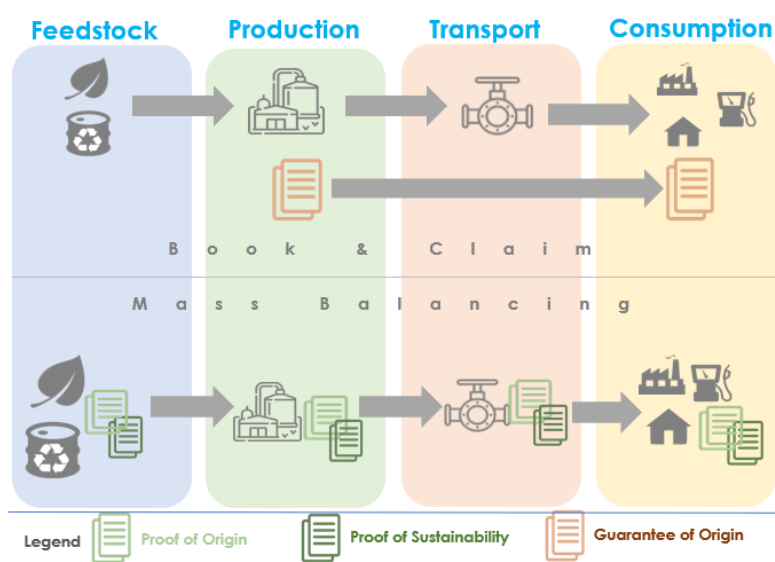


Table 3 Differences between Mass Balance and Book & Claim

Requirements	Mass balance	Book & Claim
<b>Physical connection between production and consumption</b>	<p>Physical connection required.</p> <p>Physical product and certificates (Proof of Sustainability) must be transferred together.</p>	<p>Physical connection not required.</p> <p>Physical product and certificate (Guarantee of Origin) may be transferred independently.</p> <p>However, GO registries may impose specific requirements, e.g. that producer and consumer are in the same geographical region (e.g. Europe) or have a physical connection (e.g. exclude Iceland).</p> <p>As such, Book &amp; Claim may be used without difficulties for trading renewable gas via the gas grid network.</p>
<b>Expiry period</b>	<p>Maximum of 3 months between production and consumption defined by voluntary scheme (ISCC rules). Positive balances can be carried forward into the following 3-month period.</p>	<p>GOs have a validity of 1 year.</p>
<b>Accounting for transportation losses</b>	<p>Required.</p> <p>Losses from transport must be accounted for, this may apply to transports via gas grid, referring to grid leakages.</p>	<p>Not required.</p> <p>One GO issued per unit of product produced and one GO used/cancelled per unit of product consumed. Transport is not considered.</p>
<b>Evidence for consumption / withdrawal</b>	<p>Evidence of gas withdrawn is required (break-down on different levels possible).</p> <p>Consumed quantity must be booked out of balance at the last economic operator (supplier).</p>	<p>Gas withdrawal is assumed, but no evidence is required to cancel a GO.</p> <p>GO needs to be cancelled and allocated to a consumer.</p>

### 3.9 Union Database

RED II recognizes the challenges linked to cross-border ownership transfer and foresees a solution in the form of a Union Database (UDB), as per article 28 RED II. Therefore, liquid and gaseous fuels that comply with both Article 25(1) and Article 3 (1), is planned to be traced through a database set up by the European Commission in the future. The aim of this data tracing system would be to facilitate international trade of such fuels and ensure the traceability and net balancing of the system as injected sustainable capacity of gases needs to match the consumed amount. Furthermore, it would contribute to efforts of avoiding double counting of liquid and gaseous biofuels, RFNBOs and recycled carbon fuels (RCFs). However, there is high uncertainty of the implementation of the Union Database, specifically regarding its scope, governance and design features.

If implemented, the responsibility of the accuracy and transparency of this database falls on economic operators. National databases can be created and coexist with the Union Database. Aside from technical information, the content of the database should include:

- Information on the product from the point of origin up to point of fuel production, covering the full upstream supply chain.
- All energy end-uses (applicable only in the case of biomethane).

However, the details of the Union Database will be defined in the RED II Implementing Act for Voluntary Schemes for gas value chains. The Implementing Act is currently being developed by the European Commission and thus a lot of uncertainty exists around its implementation. UDB implementation is not expected before 2025, because following approval of the implementing Act, the UDB needs to be developed and integrated with national registries.

### 3.10 Certification schemes and Voluntary schemes

Certification bodies are responsible for the control and audit of certification in order to ensure the methodology defined by the certification scheme is followed. For RED II compliance, certification schemes need to be recognized at the EU MS level, the relationships between different actors are shown graphically in *figure 4*. There are several options:

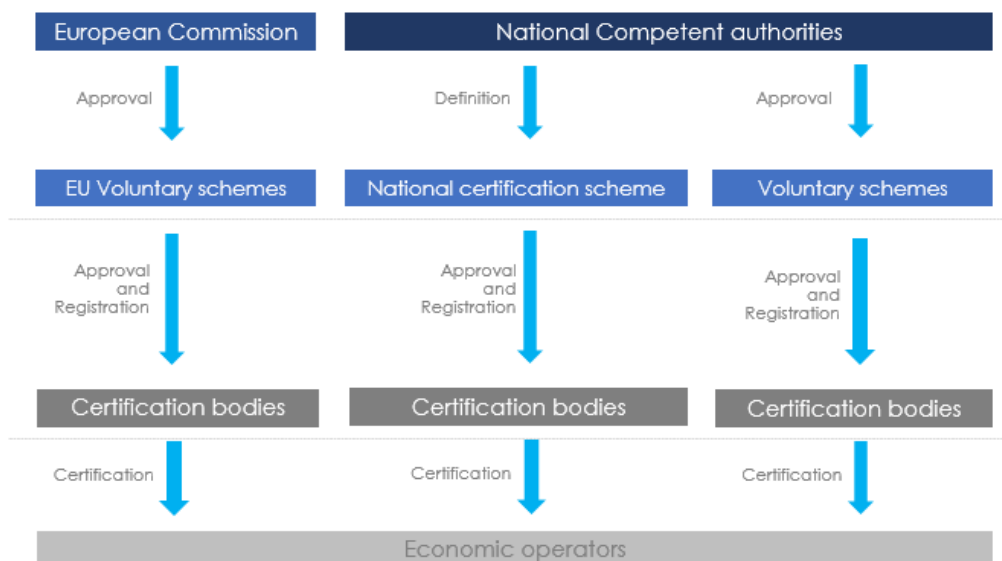
- MS can approve a Voluntary Scheme at the national level
- MS can define a national certification scheme
- Economic operators may rely on one or several EU Voluntary Scheme – a scheme recognized and approved by the EU Commission
- Combination of above-mentioned options

There are several [Voluntary Schemes](#) at international level. However, the Voluntary Schemes currently recognized by the EC do not cover Mass Balancing along the gas grid.

One or multiple certification bodies can be approved and registered by national or Voluntary Schemes. Each certification body also needs to be approved by the national

accreditation body. No Voluntary Scheme has been recognized under RED II yet, however, all schemes certified under RED I are in the process of seeking recognition.

Figure 4 Certification Schemes and Voluntary Schemes implementation process



### 3.11 Issuing bodies

Each Member State has to appoint an Issuing Body for GOs for each energy carrier as (power, green gas, heating and cooling and hydrogen), as mandated by the RED II. Some countries have a separate Issuing Body for each energy carrier, while others have appointed Issuing Bodies responsible of multiple energy carriers (e.g., the Swiss issuing body Pronovo is responsible for power, green gas and hydrogen GOs).

Figure 5 Illustration of appointing different issuing bodies for different types of energy carriers



## 4. Cross-border certificate exchange in non-segregated supply chains in Europe

### 4.1 Introduction

In this section, the historical evolution of renewable gas certification in Europe is introduced in addition to the associated challenges related to cross-border exchange of said certificates. This is followed by an overview of the main organizations involved in the facilitation of cross-border ownership transfer of renewable gas certificates in addition to their support schemes and standards. Finally, an overview of the current state-of-play of import and export of renewable gas certificates is provided for each country included in the study scope, i.e., Germany, Denmark, France, the Netherlands, United Kingdom, Austria, Sweden and Italy.

### 4.2 Context of cross-border exchange and main challenges

Certification is vital to prove the quantity and quality of renewable gases and develop a reliable renewable gas market. Considering this, several market actors and European countries have established national renewable gas registries and certification bodies in the past decade. *Figure 6* displays the renewable gas registries in operation in Europe. The countries within this study's scope that have an operating registry are presented in blue. The states in light grey will not be covered in this report. Some of these registries were established on voluntary basis deriving from market initiatives, while others from a governmental mandate.

Figure 6 Overview of renewable gas registries in Europe





The Renewable Energy Directive II (RED II) has extended the purpose of Guarantees of Origin to gas, according to Article 19, and refers to CEN EN 16325 for the rules of certification of renewable gas that are now used as guideline by the national registries. Before the implementation of RED II, there was no (international) regulation or international standard in place for certifying renewable gas. As a consequence, the current gas certification markets and involved actors differ across European countries. The lack of harmonization and standardization makes it challenging to engage in cross-border ownership exchange of renewable gas certificates due to multiple factors:

- **Different actors involved:** In some countries, there are several registries for renewable gas covering different application purposes, while in others, there are none. Registry operators range from subsidiaries of gas transmission system operators (TSOs) to operators derived from market initiatives and government bodies.
- **Different systems:** In some countries, a Mass Balancing principle is applied to prove the renewability of gas in the grid by proof of injection and withdrawal of renewable gas into and from the national grid, which is considered one single logistical facility. Other countries do not accept this approach.
- **Difference in certificates:** Certificates apply different data fields and different specifications of these data fields. The information compiled on a certificate is usually highly specific to national requirements and harmonization to a European system is performed at a later stage.
- **Different purposes of certificates:** Certification is used for different purposes such as disclosure and target compliance or national subsidy schemes and national tax exemption/rebate systems. In Denmark, Germany and the Netherlands certificates (similar to GOs) are even used to show compliance for EU ETS as further described in the section on emission reporting.
- **Different application purposes are covered by different pieces of legislation:** Often responsibilities lie within different ministries or on EU level with different Directorate Generals. For example, Energy lies with DG ENER while biofuels are with DG CLIMA.
- **Different application purposes pose different quality criteria on the energy carriers.** For example, target compliance requires sustainability certification and mass balance while consumer disclosure does not have these requirements.
- **Different stages of development for Issuing Body of GOs for renewable gas:** Several EU Member States have yet to implement an Issuing Body for biomethane GOs. Meanwhile, there is only one country that has established a hydrogen GO Issuing Body, namely Vertogas in the Netherlands.
- **Lack of IT interfaces and standard communication protocols (business and settlement processes):** Domestic registries are historically developed independently, satisfying needs for national subsidy schemes and certification purposes, resulting in a lack of (standardization of) communication protocols between registries. This is being tackled by several international organizations, as further detailed in the section below.

This lack of standardization and harmonization across European renewable gas registries induces a risk of:

- **Double counting:** several countries may acknowledge and consider the same amount of renewable gas in their energy statistics. **Potential remedy:** To avoid such double counting, exporting countries shall cancel the environmental benefits of their domestic production once it is exported and to allow counting towards another country's targets. Or importing countries may not claim the environmental benefits and not recognize the imported energy as renewable.
- **Double marketing:** several producers, consumers or intermediaries claim the environmental benefits of the same amount of renewable gas. **Potential remedy:** To avoid this, only the end-user that cancels the certificate may claim the environmental benefit of the energy.
- **Double subsidies:** several domestic schemes of supporting and acknowledging green energy may be applicable to the same quantity of green energy. This induces a risk of fraudulent activities in international transactions for example to benefit from domestic support schemes in different countries. **Potential remedy:** To avoid this, there should be interfaces between the schemes or the schemes should implement a cooperation agreement which allows them to exchange data and information on a regular basis.

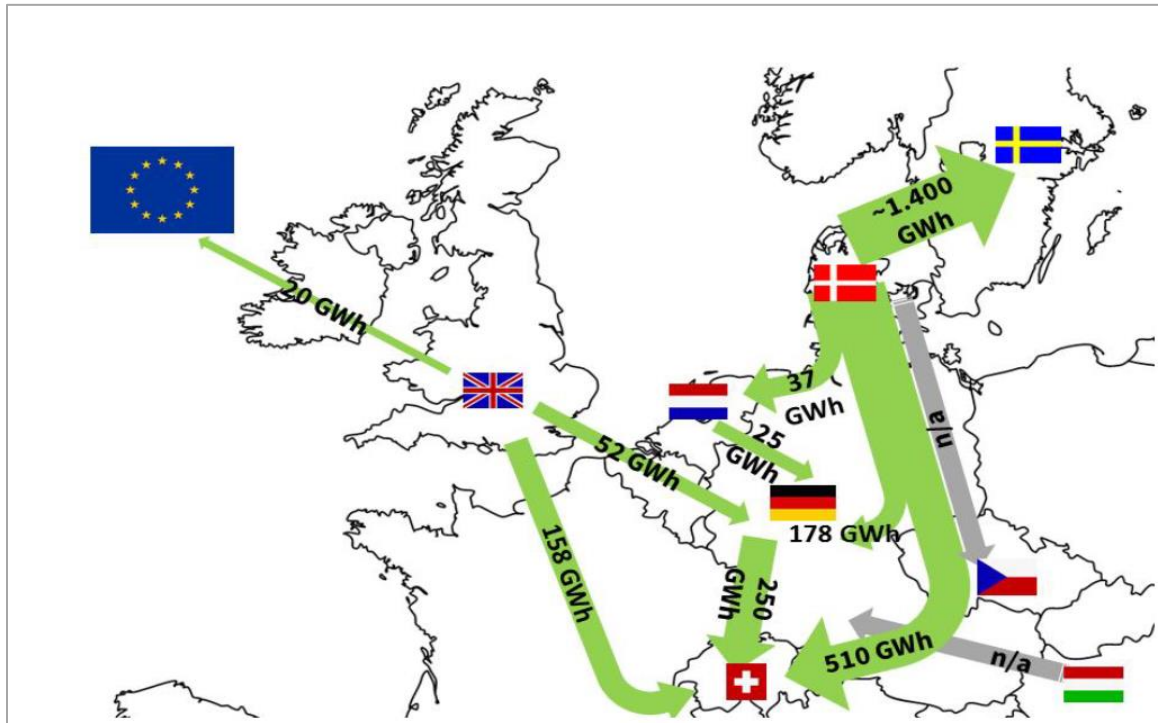
To avoid double counting, double marketing and double subsidies, it is vital that the national registries and regulatory frameworks are well aligned allowing to mitigate aforementioned challenges.

Figure 7 Possibility to exchange renewable gas certificates

Figure 7 describes in which European countries it is currently (i.e., June 2022) possible to exchange renewable gas certificates internationally and have these certificates recognized for disclosure and/or target compliance. A more detailed overview of the possibility to exchange renewable gas certificates through international trade is presented in section 8 for each of the countries within this study's scope.

	Imports of renewable gas		Exports of renewable gas	
Germany	✓	(ERGaR, Energinet)	✓	(ERGaR, Energinet)
Denmark	✗		✓	(dena ex-domain SE)
United Kingdom	✓	(ERGaR)	✓	(ERGaR)
Netherlands	✗		✓	(ERGaR)
France	✗		✗	
Sweden	✓	(Energinet, dena)	✗	
Austria	✓	(ERGaR)	✓	(ERGaR)
Italy	✗		✗	
Spain	✗		✗	
Estonia	✗		✗	
Slovakia	✗		✗	
Lithuania	✗		✗	
Switzerland	✓	(GGCS, Energinet, Dena, AGCS)	✗	
Ireland	✗		✗	

Figure 8 Cross-border exchange of renewable gas certificates through non-segregated supply chains in 2020



Source: dena 2021

Note that several countries/registries intend to facilitate and allow cross-border exchange of certificates in the near future. A description of the expected regulatory evolutions at state level can be found in section 8.

Figure 8 shows an overview of the cross-border exchange of ownership of renewable gas certificates in non-segregated supply chains in 2020. This is mainly driven by (energy) tax exemptions that can be achieved for the consumption of biomethane in Sweden. In Switzerland, the import is mainly driven by high demand in the voluntary market in combination with low domestic production. Many European countries such as France and Belgium are not involved in cross-border exchange (yet).

## 5. International organizations involved in cross-border trade of renewable gas certificates

### 5.1 Introduction

There are several initiatives and organizations that aim to harmonize and standardize certificates to facilitate cross-border exchange of renewable gas certificates. In the past, many of these initiatives took the form of bilateral agreements between registries, for example, the dena (Germany) - AGCS (Austria) bilateral agreement. However, developing such bilateral agreements is time-intensive, especially the implementation of several bilateral agreements by one registry operator, while more European countries and market participants want to engage in cross-border exchange. To avoid that each registry has to develop its own bilateral agreements, there are several organizations that

have defined, or are currently defining, rules and standards aiming to replace bilateral agreements in Europe. In the following section, the main organizations are described in addition to their standards and schemes.

## 5.2 AIB

AIB is the Association of Issuing Bodies aisbl, a non-profit, Brussels-based international association, founded in 2002. It gathers the Issuing Bodies of energy certificates and operates the European Energy Certificate System (EECS®), a voluntary standard that proposes rules for cross border transfer of energy certificates. AIB facilitates the operation and maintenance of EECS® (European Energy Certificate System), including its IT supportive mechanisms (AIB hub) and a discussion forum with a robust decision-making structure that enables continuous development of this voluntary standard, for its members.

The principles of EECS® were applied to the EN16325 standard for Guarantees of Origin in 2013, while EECS® comprises harmonization of more detailed protocols to ensure efficiency in cross border transfers while still allowing the flexibility to adapt to changing circumstances.

Historically, AIB comprises all Issuing Bodies for electricity Guarantees of Origin, while some Issuing Bodies for gas Guarantees of Origin have recently joined too. In 2019, AIB also expanded its activities from exclusively power to include all renewable gases, including hydrogen as well as heating and cooling. In February 2020, 30 issuing bodies were members of AIB, from 27 European countries. In 2020, AIB revised its articles of association to facilitate independent decision making by issuing bodies for electricity respectively for gas, for energy-carrier-specific topics.

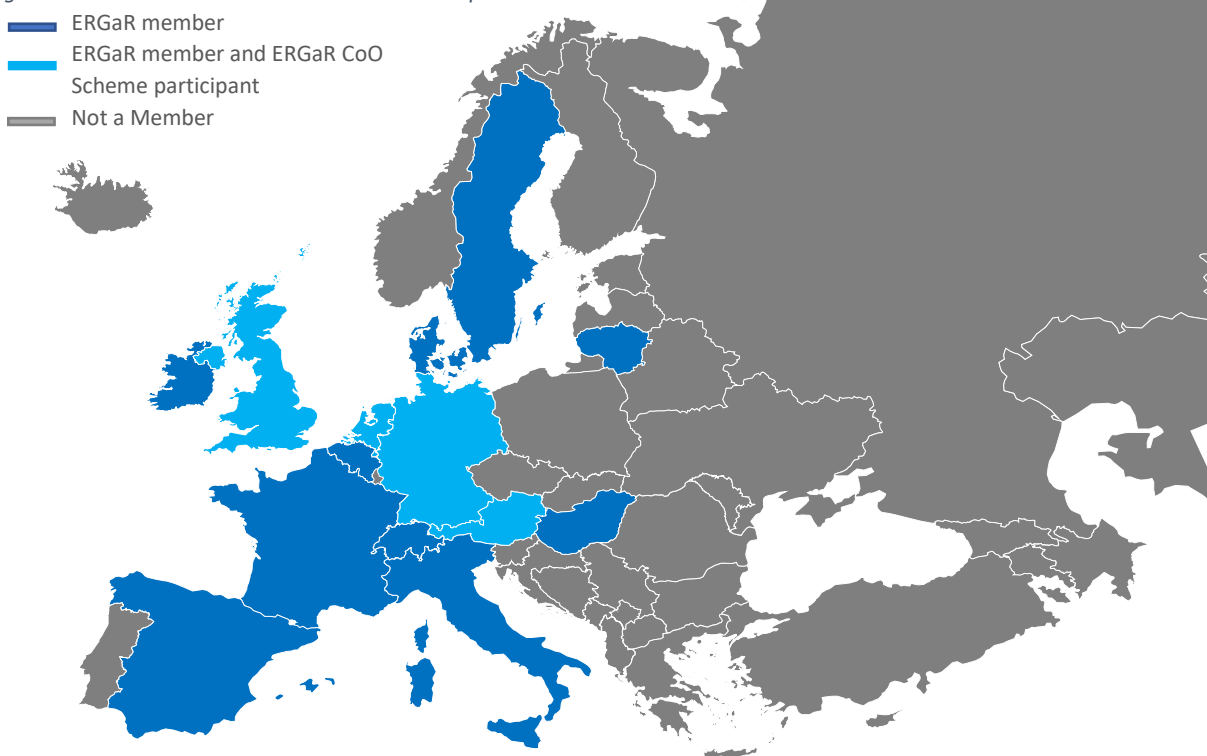
## 5.3 ERGaR

ERGaR is the acronym for the European Renewable Gas Registry aisbl, an international, non-governmental, non-profit organization, founded in 2016. ERGaR has 29 members from 14 European countries, as shown in *figure 9*, in dark blue. This includes nine national biomethane registries (AT, CH, DE, DK, FR, IE, LT, NL, UK), some of which have been appointed as Issuing Bodies for gas GOs (such as the Netherlands, Denmark, Lithuania and Ireland). ERGaR's objective is to facilitate the Europe-wide cross-border certificate ownership transfer of renewable gas by establishing an independent, trustworthy, and transparent documentation system for renewable gas that is distributed via the European interconnected gas network. This is done by providing documentation for cross-border transfer of sustainable biomethane / renewable gas Certificates of Origin and enabling transfer processes via the IT-system ExtraVert Platform, developed and maintained by Vertogas B.V.

RGaR has developed a voluntary standard for cross-border exchange of renewable gas GOs, the ERGaR CoO scheme. ERGaR has adopted the term CoO (Certificate of Origin), to describe documentation of renewable gas injections, that may hold the same information as a GO under Article 19 RED II but may not have been created by a national biomethane registry who has been appointed as a "issuing body" via governmental mandate. A CoO may also include additional information compared to a GO, for

example information on greenhouse gas emission intensity or a PoS issued by complying with the rules of a recognized voluntary scheme.

Figure 9 ERGaR members and CoO Scheme Participants



The ERGaR CoO Scheme was primarily designed to meet the demand of consumers for a method of disclosing their use of renewable gas which, depending on the countries and the reporting methodology, can have various benefits. These benefits are largely related to corporate emissions reporting and statutory uses. The Scheme is designed to evolve as the market develops and as the implementation of RED II takes place across Europe and other sectors, e.g., the EU ETS. The CoO Scheme participants are displayed in figure 9 in light blue. The grey countries are not (yet) members of ERGaR.

#### 5.4 CertifHy

CertifHy represents a project consortium founded in 2014. It has been initiated by request of the European Commission and is financed through the Clean Hydrogen Partnership. It consists of a consortium led by Hincio, composed of Grexel, Ludwig Bolkow Systemtechnik (LBST), AIB, CEA and TÜV Süd. The CertifHy Scheme document sets out the general guidelines and governance of the CertifHy Scheme – a European Certification Scheme for hydrogen fulfilling specific environmental criteria. At this stage, the scheme covers hydrogen for disclosure, but the framework leaves room for additional purposes. CertifHy's mission is to define the conditions for production of green and low carbon hydrogen and to facilitate the production, procurement and consumption of hydrogen fulfilling these ambitious environmental criteria. CertifHy does so together with

its over 60, and growing, industry partners. CertifHy certificates for green and low-carbon hydrogen are being issued as part of a pilot project, and can be traded Europe-wide.

## 6. Support mechanisms

### 6.1 Introduction

In this section, the different types of support schemes in place for renewable gas in Europe are described. A distinction is made between support schemes for production and support schemes for consumption of renewable gas. Next to support schemes, market instruments that induce price premiums for renewable and low-carbon content of renewable gas are also described.

There are several types of support schemes for biomethane production in Europe. Support mechanisms on the production side are summarized in *table 4* and consumption support options are described in *table 5*.

*Table 4 Support schemes for biomethane production in Europe*

Production Support	Type	Description
Feed-in tariff	Support scheme	Financial support granted for the generation of renewable energy.  Feed-in tariff can either be paid by the state (tax financed) or by the energy consumers (privately financed by way of an energy levy).  Financial support shall compensate the additional costs for producing energy out of (having received financial support the green energy may be traded on the same free market with fossil energy).
Feed-in premium	Support scheme	Similar mechanism to feed-in-tariff, while not a fix tariff is paid but a premium price/amount on top of the prevailing market price. Premium prices can be designed as fixed premium prices or sliding premium prices, etc.
Tax exemptions	Support scheme	Granting a financial benefit for producing renewable energy in the form of tax exemptions.
Investment support	Support scheme	An investment support is a fixed amount received before, during or shortly after the construction phase of the plant. It is independent of the amount of renewable energy production

<p>Quota/green certificate scheme</p>	<p>Support scheme</p>	<p>In a quota/green certificate system, the production of renewable energy is encouraged by an obligatory target stating a specific share of renewable energy in the mix of producers, consumers or distributors. Often compliance is tracked by the trade of renewable energy certificates, which provide an additional supplementary revenue to energy sales. Renewable energy generators benefit by selling their energy to the grid at market price and additionally selling certificates on the green certificates market.</p>
<p>Market premium</p>	<p>Market instrument</p>	<p>The environmental and climate benefits of renewable energy will create market premium prices compared to conventional energy. These premiums are voluntarily paid by the consumer for receiving a premium value product.</p>
<p>CO<sub>2</sub> emission allowances</p>	<p>Market instrument</p>	<p>Emitting market actors subject to the EU ETS must acquire "emission allowances" (EU ETS allowances, EUA or EUAA) (usually a certificate) entitling the holder to emit one ton of carbon dioxide equivalent within a given time period.</p> <p>Only the purchase or holding of ownership of such a certificate allows the release of fossil energy carriers or CO<sub>2</sub> emission into the free market.</p> <p>Emission allowances make fossil energy sources more expensive and allow higher realizable market prices for renewable energy.</p>

Table 5 Support schemes biomethane consumption in Europe

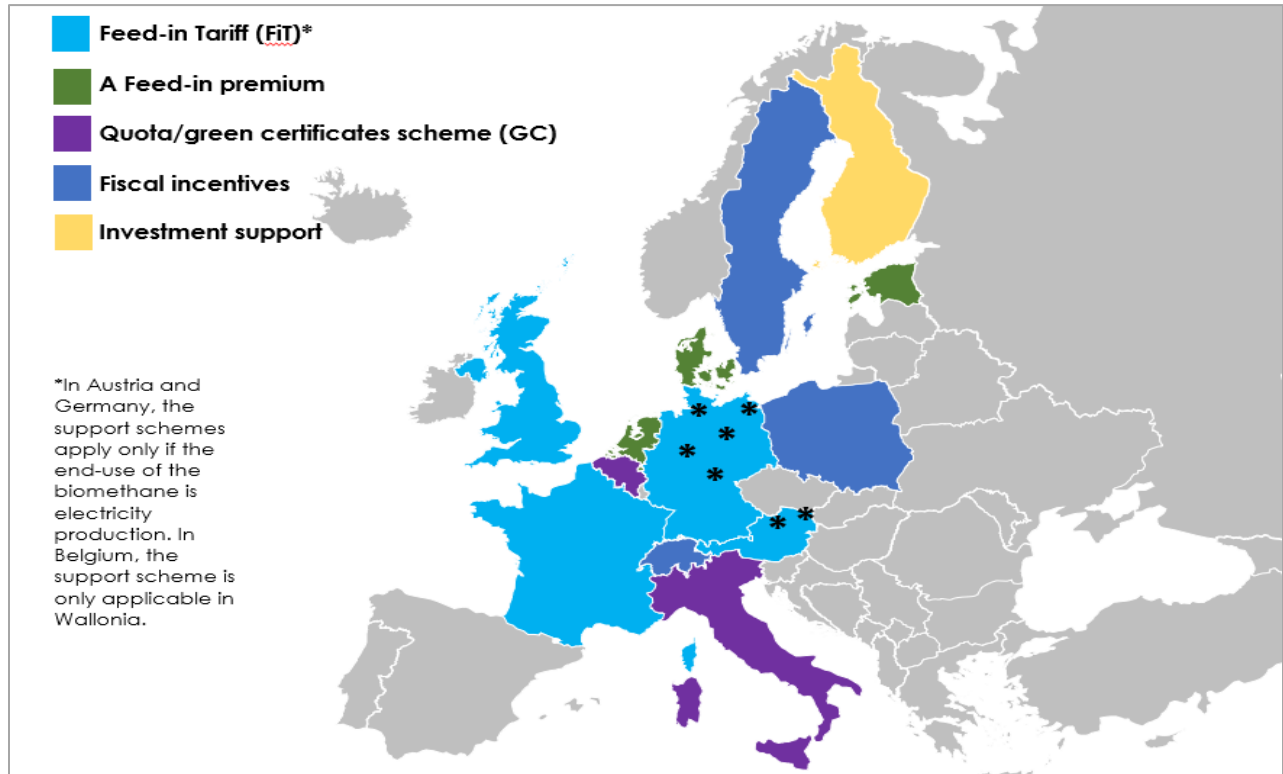
Support Consumption	Type	Description
Tax exemptions or tax rebate	Support scheme	Granting a financial benefit for using renewable energy. This enables consumers to pay a higher price for renewable energy.
Emission reduction obligations	Support scheme	Emission-based scheme with the intention of creating a market for renewable energy and a price competition between the options for reducing greenhouse gas emissions.
Blending obligations	Support scheme	Quantity-based scheme with the intention to ensure a minimum share of renewable energy consumption in a specific sector.
CO <sub>2</sub> emission allowances	Market instrument	<p>Emitting market actors subject to the ETS must acquire "emission allowances" (EU ETS allowances, EUA or EUAA) (usually a certificate) entitling the holder to emit one ton of carbon dioxide equivalent within a given time period.</p> <p>Only the purchase or holding of ownership of such a certificate allows the release of fossil energy carriers or CO<sub>2</sub> emission into the free market.</p> <p>Emission allowances make fossil energy sources more expensive and induce higher prices for renewable energy.</p>

## 6.2 Overview of support mechanism for biomethane in Europe

In figure 10, the most important national support mechanisms for biomethane in Europe are mapped (source: REGATRACE, 2020). Often, there are several types of support mechanisms in place in a single country with differing levels of uptake. A detailed description of the support mechanisms for biomethane production and consumption for each country can be found in section 8 certification and cross-border exchange of renewable gases across Europe.



Figure 10 Support mechanisms for biomethane in Europe



Source: REGATRACE

## 7. Renewable gas emission reporting

### 7.1 Introduction

This section describes the link between biomethane certificates and emissions reporting under the EU Emissions Trading System (ETS) and within the National Inventory Reports (NIR) according to the legal framework of the Paris Agreement on Climate Change.

### 7.2 EU ETS

The EU Emissions Trading System (ETS) works on the principle of 'cap-and-trade'. It sets an absolute limit or 'cap' on the total amount of certain greenhouse gases that can be emitted each year by the entities covered by the system. This cap is reduced over time so that total emissions fall. The sectors covered by the existing EU ETS includes power and heat generation, energy-intensive industrial sectors such as cement and steel and aviation within Europe.

Under the EU ETS, regulated entities buy or receive emissions allowances, which they can trade with one another as needed. At the end of each year, regulated entities must surrender enough allowances to cover all their emissions. If a regulated entity reduces its emissions, it can keep the "saved" allowances to cover its future needs or sell them to another entities.

EU Member States have the possibility to allow entities covered by EU ETS to use biomethane certificates to prove that their natural gas consumption fully or partially does not have CO<sub>2</sub> emissions if specific requirements are met. These requirements have been defined by the Commission Implementing Regulation (EU) 2020/2085<sup>1</sup>, by which the Implementing Regulation (EU) 2018/2066 on the Monitoring and Reporting of Greenhouse Gases ("Monitoring Regulation")<sup>2</sup> has been modified. According to Article 38 para. 5 and Article 39 para. 4 Monitoring Regulation biomethane must fulfill the following requirements in order to be accounted as emission neutral under the EU ETS:

- The biomethane must fulfill the **sustainability criteria** according to Article 29 of RED II (cf. Article 38 para. 5 Monitoring Regulation);
- Compliance with the sustainability criteria may be verified and documented in line with Articles 30 and 31 (1) of RED II;
- In the alternative, Article 39 para. 4 Monitoring Regulation enables a simplified standard of proof if the consumer and the producer of the biogas are connected to the **same gas grid**. If this requirement is fulfilled it is sufficient for the consumer to provide purchase records of biogas of the equivalent energy content and demonstrate, i.a. by Biomethane GOs in the sense of Article 2 No. 12 of RED II that the biogas purchased will not be used by anyone else.

**Summary:** Within the European legal framework of the EU ETS it is admissible to import green gases via the gas grid ("non-segregated import") and to account such imported green gases as emission neutral. Member states however are not obliged to implement this possibility into their domestic legislation.

In fact, as illustrated in *figure 11*, only the Netherlands, Denmark and Germany currently allow the use of biomethane certificates for EU ETS reporting while France intends to allow it as of 2023.

While Germany accepts biomethane certificates issued in other Member States for EU ETS purposes, the Netherlands and Denmark currently only accept biomethane certificates issued domestically.

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<sup>1</sup> Commission Implementing Regulation (EU) 2020/2085 of 14 December 2020 amending and correcting Implementing Regulation (EU) 2018/2066 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council

<sup>2</sup> Commission Implementing Regulation (EU) 2018/2066 of 19 December 2018 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council and amending Commission Regulation (EU) No 601/2012

Figure 11 Use of biomethane certificates for EU ETS reporting

	Use of National Biomethane Certificates for EU ETS reporting	Use of imported Biomethane Certificates for EU ETS reporting
Germany	✓	✓
Denmark	✓	✗
United Kingdom	✗	✗
Netherlands	✓	✗
France	✗ (under development)	✗
Sweden	✗	✗
Austria	✗	✗
Italy	✗	✗

### 7.3 Renewable Gas Transported via the Grid and their Recognition within the National Inventory Reports under the UNFCCC

This section deals with the question whether biomethane (or other green gas) injected into the natural gas grid in one country ("export country") may be recognized as green gas with a lower emission factor than fossil natural gas within the National Inventory Report ("NIR") of another country ("import country").

#### 7.3.1 Legal Framework for composing National Inventory Reports

According to Art. 13 para. 7 lit. a) of the Paris Agreement (signed on 12 December 2015 on COP 21) (as well as Art. 4 para. 1 lit. a), Art. 12 para. 1 lit. a) of the UNFCCC) each country which is party to the Agreement shall regularly provide a "national inventory report of anthropogenic emissions". The National Inventory Report shall be prepared in accordance with the "good practice methodologies accepted by the Intergovernmental Panel on Climate Change" as agreed between the parties to the UNFCCC. The "good practice methodologies" in this sense are contained particularly in the decision 24/CP.19 (rendered on COP 19), in which the 2006 IPCC Guidelines for National Greenhouse Gas Inventories have been formally adopted (the "Guidelines").

According to Art. 13 para 13 Paris Agreement the Conference of the Parties serving as the Meeting of the Parties to the Paris Agreement ("CMA") shall "adopt common modalities, procedures and guidelines, as appropriate, for the transparency of action and support". Based on this regulation the CMA has adopted the "Enhanced Transparency Framework" 2018 in Katowice (Decision 18/CMA.1), which has been further modified by the CMA 2021 in Glasgow (Decision 5/CMA.3). According to Decision 18/CMA.1, No. 20 for providing the National Inventory Reports, the Parties shall use the

2006 IPCC Guidelines, and shall use any subsequent version or refinement of the IPCC guidelines adopted by the CMA.

In accounting emissions, the Guidelines follow a [territorial principle](#). This principle requires every country to account all emissions that occur in its territory. Generally, the emissions are calculated by multiplying the human activity occurring in the reporting country, measured as Activity Data (AD), with the emission factor (EF), which quantifies the emissions by unit of Activity (cf. Guidelines, Chapter 1, No. 1.6).

### 7.3.2 Principles for Accounting Biogenic Gas and Fuels

Emissions resulting from the combustion of biofuels are to be calculated with “*biofuel-specific emission factors*” (Vol. 3, Ch. 3.2.1.2., page 3.17 IPCC Guidelines). However, the “*CO<sub>2</sub> emissions from the combustion of the biogenic carbon of these fuels are treated in the Agriculture, Forestry and Other Land Use (AFOLU) sector*” (Vol. 3, Ch. 3.2.1.2., page 3.17). This is additionally stipulated in Vol. 2, Ch. 2.3.3.4, 1<sup>st</sup> point, page 2.33 of the IPCC Guidelines: “*Emissions of CO<sub>2</sub> from biomass fuels are estimated and reported in the AFOLU sector as part of the AFOLU methodology. In the reporting tables, emissions from combustion of biofuels are reported as information items but not included in the sectoral or national totals to avoid double counting.*” Thus, emissions resulting from the combustion of biomass are indicated but not accounted in the Energy Sector or the Industry Sector.

In case of mixtures of biogenic and fossil fuels the biogenic share must be evaluated. Cf. Vol. 2, Ch. 2.3.3.4, 6<sup>th</sup> point, page 2.34 of the IPCC Guidelines: “*In some instances, biofuels will be combusted jointly with fossil fuels. In this case, the split between the fossil and non-fossil fraction of the fuel should be established and the emission factors applied to the appropriate fractions.*” Similarly, Vol. 3, Ch. 3.2.1.2., page 3.17 IPCC Guidelines states: “*To avoid double counting, the inventory compiler should determine the proportions of fossil versus biogenic carbon in any fuel-mix which is deemed commercially relevant and therefore to be included in the inventory.*”

### 7.3.3 Physical Approach for Accounting Biogenic Gas and Fuels

It is the common understanding among international experts in emission reporting that the IPCC Guidelines follow a physical approach. This means that only carbon atoms recently taken from the atmosphere (e.g. stemming from biomass) may be accounted with low/no emissions when being combusted (identity of the generated and combusted biomass). Even though the IPCC Guidelines do not explicitly stipulate for this physical approach, it is at least indicated in some provisions (e.g. Vol. 3, Ch. 3.2.1.2., page 3.17 IPCC Guidelines: “*The share of biogenic carbon in the fuel can be acknowledged by either refining activity data (e.g. subtracting the amount of non-fossil inputs to the combusted biofuel or biofuel blend) or emission factors (e.g. multiplying the fossil emission factor by its fraction in the combusted biofuel or biofuel blend, to obtain a new emission factor).*”). The physical approach follows from the desire to accurately monitor the cycle of carbon and other climate relevant substances. Further, the principle of territoriality (see above) implies a physical approach, as the actual emission relevant events within each territory shall be grasped.

Would green gas be imported physically (e.g., in a trailer crossing the border), the respective emission factor for green gas could be applied to the imported amount. However, if green gas is not imported physically but only its intrinsic value (renewable quality) is imported (proven by a certificate or a Mass Balancing mechanism), this will be considered as an import of fossil gas in terms of the IPCC Guidelines. Therefore, green gases not imported physically are not accountable as (largely) emission neutral within the NIR. This follows out of the territorial principle (described in sec. 7.3.1) and the physical approach (described above).

In addition, the IPCC Guidelines recommend basing the NIR on the national energy statistics, for recording imports and exports of energy. The principles of energy statistics are laid down particularly in the “Energy Statistics Manual” issued by the International Energy Agency (IEA) and Eurostat. According to these principles only physical flows are relevant for recording imports and exports. Importing countries generally collect data on imported goods according to the principles of customs law. In customs law, however, only the physical condition of imported goods is relevant. Therefore, intrinsic values that are imported on balancing level would not be recognized within the energy statistics and could therefore not be considered when composing the NIR.

Finally, the IPCC Guidelines are designed in a way to ensure a high degree of legal certainty and easy applicability when composing the NIR. These requirements are derived from the fact that the IPCC principles on NIR-composition are applied worldwide by practitioners from different jurisdictions. These two requirements demand to base the NIR on facts which are easily detectable. Concepts of virtual transports of intrinsic values would contradict these principles as they are not easily detectable – at least as long as there is no internationally recognized register for tracing such transactions.

In line with the reasons outlined above the authors of this study could in fact not identify any country which accounts green gases imported via the grid as green within its NIR.

#### 7.3.4 Room for a future development of the accounting principles?

It is questionable whether there would be room for interpreting the IPCC Guidelines in a way, that an import of merely the intrinsic value of green gas could be acknowledged as green gas import.

If green gas does not physically enter the territory of the importing country but rather its intrinsic value is transferred into the importing country, the importing country must ensure that the following two requirements are fulfilled:

**1<sup>st</sup> requirement:** It must be ensured that the intrinsic value of the green gas is not exported into any other country so that no other country may account the intrinsic value in its Inventory Report. This may be proven by systems of proof which provide a sufficient certainty that the green gas was not sold twice. The Guidelines do not specify when a sufficient level of proof is fulfilled. However, they clarify that the principle of accuracy requires that “uncertainties are reduced as far as practicable” (Guidelines No. 4 (e)).

**2<sup>nd</sup> requirement:** In addition, it must be ensured that the country where the green gas was produced and out of which it was exported, does not account the exported quantities of green gas (resp. their intrinsic value) as emission neutral in its Inventory Report. This may only be proven by an official statement of the export country.

If these two requirements are fulfilled, there seem to be strong arguments that imported green gas could be considered as (largely) emission neutral within the NIR of the importing country. However, it is doubtful whether the IPCC Guidelines would allow such interpretation or whether a modification of the IPCC Guidelines would be necessary. Irrespective of this question, such future development of NIR-principles should be implemented on an international level to keep internationally harmonized standards. In general, importing countries may only account imported green gases as “green”, if it is ensured that the exporting countries have not accounted the green gas in their NIR.

An alternative solution for handling cross-border transports of the intrinsic value would be statistical transfers according to Art. 6 Paris Agreement. Such transfers however require a state agreement between the exporting country and the importing country. Statistical transfers in the sense of Art. 6 Paris Agreement do not change the methodology for composing NIRs but rather have the effect that countries partially take over the nationally determined contribution (“NDC”) of other countries. In general, each country which is party to the Paris Agreement has undertaken a NDC in reducing greenhouse gas emissions (cf. Art. 3 Paris Agreement). Through the statistical transfer a country may transfer its achievement in emission reduction to another country. The transferred achievement does not account to the NDC of the transferring country but rather to the NDC of the other country (cf. Art. 6 para. 5 Paris Agreement).

## 7.4 Summary

Green gas transported grid-based within the Member States of the European Union may be accounted under the EU ETS, if some specific conditions are fulfilled. However, within the legal framework of the Paris Agreement cross-border transports of green gases via the grid are currently not recognized. The reason for this divergence is that the European Union has also joined the Paris Agreement as “regional economic integration organization” and has communicated a joint NDC to be fulfilled commonly by all Member States (cf. Art. 4 para. 16 Paris Agreement). Therefore, green gases transported cross-border within the European Union will always account to the EU-emission reduction target no matter in which NIR they appear.

This might also be the reason why the European Union is currently not planning to modify the principles of energy statistics in a way that green gases transported cross border could appear in the energy statistics of the importing countries (and thus the NIR of the importing countries).

## 8. Certification and cross-border transfer of renewables gas across Europe

### 8.1 Introduction

This section provides an overview on the national context of certification of renewable gas, the main support mechanisms for renewable gas and state-of-play of cross-border exchange in each of the countries within this study's scope, namely Germany, Denmark,

United Kingdom, The Netherlands, France, Sweden, Italy and Austria. The information was gathered through desk research in addition to interviews with certification experts from national registries, international organizations and certification bodies.

## 8.2 Overview of certificates and cross-border transfer of renewable gas

While some countries use biomethane certificates for disclosure purposes, others use them to prove compliance with RED II targets as well. The possibility to use these certificates to prove compliance with EU ETS is another element that differs from country to country. *Table 6* summarizes the findings that will be explained in detail in this section.

Table 6 Country overview on use of domestic certificates







	Country	Registry	Chain of custody model	Certification purpose Disclosure (D) Compliance (C)	Certificates allowed for RED II target compliance	Certificates allowed for EU ETS compliance	Main support mechanisms for biomethane
<b>Domestic</b>	Germany		B&C MB	D+C	☑	☑	<ul style="list-style-type: none"> <li>• FIT for electricity generation</li> <li>• Renewable fuel quota</li> <li>• Blending obligation in transport</li> <li>• Tax reductions</li> </ul>
	Denmark		B&C	D+C	☑	☑	<ul style="list-style-type: none"> <li>• FIP</li> <li>• Tax exemption</li> </ul>
	United Kingdom		B&C MB- requires additional audit	D	✗	✗	<ul style="list-style-type: none"> <li>• FIT</li> <li>• Transport fuel obligation</li> </ul>
	Netherlands		B&C	D+C	☑	☑	<ul style="list-style-type: none"> <li>• FIP</li> </ul>
	France		B&C	D	✗	Under development	<ul style="list-style-type: none"> <li>• FIT</li> </ul>
	Sweden	✗	MB	D+C	☑	✗	<ul style="list-style-type: none"> <li>• Tax exemptions</li> </ul>
	Austria		B&C MB	D+C	☑	✗	<ul style="list-style-type: none"> <li>• Fit for power production Biomethane (phased out)</li> </ul>
	Italy	✗	✗	D	✗	✗	<ul style="list-style-type: none"> <li>• Green certificates</li> </ul>
✗ = not possible      ☑ = possible							

Table 7 shows which European countries are currently (i.e., June 2022) involved in cross-border exchange of renewable gas certificates and recognize imported certificates for disclosure.

Today, imported certificates cannot be used for RED II target compliance yet. According to Art. 28 para. 2 RED II however, a *Union Database (UDB)* will be put in place to ensure transparency and traceability of renewable fuels. While Member States will be allowed to continue to use or establish national databases, those national databases should be linked to the Union database, in order to ensure instant data transfers and harmonization of data flows and ultimately avoid double counting. The details of the UDB will be defined in the Implementing Act for Voluntary Schemes for Gaseous Value chains, which is still under development. Following the publication of this Implementing Act, the IT Infrastructure of the UDB will still have to be implemented, hence the finalization is not expected before end of 2023.

As soon as the UDB will be in operation, biomethane transported cross-border via the grid will be accountable to the national RED II-targets for renewable energy of the importing Member State, if both the exporting and the importing Member State report consistent figures (same export from A to B reported by both Member States A and B). In addition such cross border trades have to be registered in the UDB.

Table 7 Country overview on possibility of cross-border trade and subsequent use of imported certificates

	Country	Possibility to engage in cross-border exchange of certificates			Use of imported certificates			
		Import of certificates	Export of certificates	Trading partners	Certificate can be used for disclosure	Certificates can be used for EU ETS compliance	Certificates can be used for RED II target compliance	Certificates can be used to receive support
<b>Cross-border</b>	Germany	☑	☑	ERGaR + DK+SE	☑	☑	✗	✗
	Denmark	✗	☑	SE, CH, DE	N.A	N.A	N.A	N.A
	United kingdom	☑	☑	ERGaR	☑	✗	✗	✗
	Netherlands	✗	☑	ERGaR	N.A	N.A	N.A	N.A
	France	✗	✗	N.A	N.A	N.A	N.A	N.A
	Sweden	☑	☑	DK+DE	☑	✗	✗	☑
	Austria	☑	☑	ERGaR	☑	✗	✗	✗
	Italy	✗	✗	N.A	N.A	N.A	N.A	N.A
✗ = not possible      ☑ = possible      N.A = not applicable								



## 8.3 Germany

### 8.3.1 Context

The main registry operating on the gas certificate market in Germany is the dena biogas registry Germany which was established by the German Energy Agency ("dena, Deutsche Energie Agentur") in 2009. This institution is in charge of verifying and registering biomethane certificates along with other biogases. It uses both a Book & Claim system and a Proof of Sustainability certificates (PoS) system for Mass Balancing. Since 2022, dena is a participant in the ERGaR CO scheme through which cross-border ownership transfer is facilitated. This topic will be discussed later on in this section.

There is another registry exclusively responsible for sustainable biofuels, namely NaBiSy (Nachhaltige-Biomasse-Systeme), which is operated by the Federal Agency for Agriculture and Food (BLE, Bundesanstalt für Landwirtschaft und Ernährung). It is used for registering the PoS for liquid and gaseous biofuels.

As for hydrogen, it can also be registered with dena and qualifies as a "biogas on the basis of hydrogen" when produced with at least 80% renewable electricity.

There is not yet a governmental mandate given to nominate an issuing body for gas and hydrogen, neither for heating and cooling. This means that the GOs issued are not REDII compatible.

### 8.3.2 Support mechanisms for biomethane

There are several support schemes that support biomethane production and consumption such as feed-in tariffs for renewable power from biomethane, fuel quotas and tax exemptions. In the following section, the most important support mechanisms are further described.

A [feed-in tariff for electricity generation from biomethane](#) is offered through the Erneuerbare Energien Gesetz (EEG). In accordance with the EEG from 2012, the subsidy is granted based on the size of the biomethane upgrading installation:

- Installations < 700 m<sup>3</sup>/h production capacity receive a subsidy of 3 ct/kWh<sub>el</sub>;
- Installations <1000 m<sup>3</sup>/h production capacity receive 2 ct/kWh;
- Installations <1400 m<sup>3</sup>/h production capacity receive 1 ct/kWh.

This inversely proportional system assures that funding is granted where needed. Combined with a CHP (Combined heat and power) and biogas bonus, the total subsidy is between 10 -15 ct./kWh<sub>el</sub>.

Another indirect support mechanism, under which biomethane is accountable, is the [renewable energy quota obligation for heat generation in the building sector](#). Both the Renewable Energy Heat Act of the State Baden-Württemberg (EWärmeG BW) and the Building Energy Act (GEG) require buildings to be heated by a certain share of renewable energy. Biomethane is one option for fulfilling this obligation. This quota induces a higher demand for biomethane in buildings, leading to premium prices for biomethane compared to natural gas.

Moreover, a [blending obligation](#) is imposed on the transport sector, implementing the RED I / RED II target. In accordance with the Federal Pollution Control Act (Bundes-Immissionsschutzgesetz - BImSchG) fuel companies must reduce their carbon footprint by a yearly increasing percentage. If they fail to do so they must pay a penalty of 600 € for each ton of CO<sub>2e</sub> surplus. Biomethane may be used as option for reducing the carbon footprint.

### 8.3.3 Cross-border ownership transfer of certificates

Dena enables cross-border ownership transfers for its market participants. Before joining the ERGaR CoO scheme (see definition section 5.3) , this came in the form of bilateral agreements with other national registries, such as Energinet (DK), GGCS (UK) and AGCS (AT). However, since dena became participant in the ERGaR CoO scheme, the agreements with GGCS and AGCS were replaced by the ERGaR scheme while the bilateral agreement with Energinet has remained in place, considering Energinet is not yet a member of ERGaR CoO Scheme.

For registries that are [ERGaR CoO Scheme participants](#) (GGCS-, and AGCS-Austria), both import and export are facilitated through the ERGaR scheme. However, GGCS imposes additional requirements for imports on top of the ERGaR scheme requirements. For example, certificates must not be previously recorded in any register other than dena and the start of the feed-in period should not be more than 3 years and 3 months before the issuance of the certificate.

For [non-ERGaR CoO Scheme participants](#), imports can be done either [with or without bilateral agreements](#). As the majority of German trade consists of imports from Denmark, specific requirements defined by the bilateral agreements apply.

When importing from registries without existing agreements, the plant and quantity proof is required. Additionally, for the registration with the German registry, the exporting registry must cancel the certificate in their registry and provide the proof of cancellation within the auditing report. The auditing report must state the total annual production of the registered biomethane plant and the proof of cancellation must be annexed to the report. There is a possibility to retrospectively document proof of properties for imported biogas quantities, however, this has to be confirmed through an auditor report. The receiver must instruct an auditor, who, together with the registry will conduct the auditing of the biomethane certificate.

As far as exports are concerned, dena biogas registry allows exports to registries with and without cooperation agreements and to participants of the ERGaR CoO Scheme. The transfer of a biomethane certificate is initiated through an application of a registered dena account holder. Application documents are made available by the registry management. The application must contain the receiving account holder (with the cooperating registry) and the company name to be submitted to the sending registry management (dena). A prerequisite for the export is the status "green" or "yellow" of the certificate, meaning that the quantity of biomethane to be transferred has been audited. Once the receiving market participant in the partner registry accepts the ownership of the certificate, the status is set to "red" in the German registry, marking it as

cancelled from the German market. If the transfer is denied, the sender will receive the certificate back. Exports are possible to all European registries, even if no cooperation agreement is in place and follows the same procedure.

## 8.4 Denmark

### 8.4.1 Context

Energinet is the Danish biomethane registry mandated as national Issuing Body of GOs for biomethane. The registry currently issues certificates and, in the future, will issue GOs as well to facilitate domestic and European cross-border trade. Energinet is a member of ERGaR, and is currently undergoing the application of joining the ERGaR CoO scheme.

The current certification method uses a Book & Claim system, with no Mass Balancing function yet. A pilot project is planned to add a Mass Balance product. However, sustainability can be proven by a separate certificate according to a voluntary scheme recognized by the European Commission (e.g., REDcert and/or ISCC).

Cancellation statement of Energinet certificates clearly indicate whether a quantity of biomethane was counted towards Danish national targets. Certificates issued by Energinet are also accepted by the EU Emissions Trading System for carbon reporting purposes within Denmark.

### 8.4.2 Support mechanisms

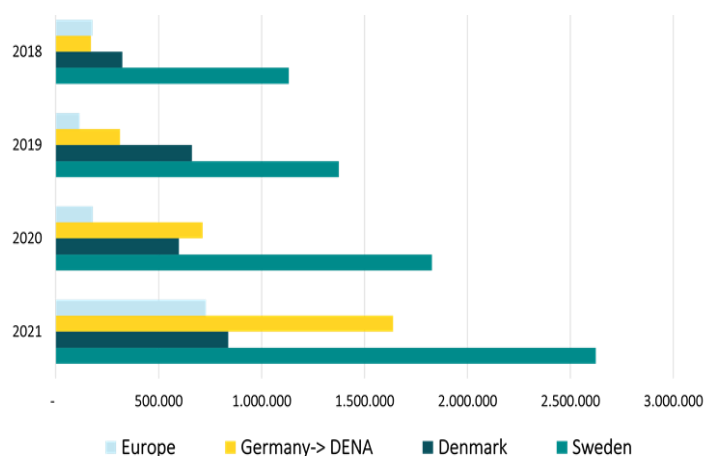
To support the production and consumption of biomethane, the Danish government introduced [feed-in premiums for biomethane](#) in 2014, which triggered large production volumes and made Denmark one of the top exporters of biomethane on a European level. The support scheme ended in 2020, however, operating plants with an ongoing support contract will benefit from the incentives until 2032, or a maximum of 20 years, depending on the case. A new support scheme is under development. Most likely, the feed-in premium will not be continued and tenders for investment support with a price ceiling will be carried out.

### 8.4.3 Cross-border ownership transfer of certificates

Denmark is a large exporter of biomethane certificates. Since Energinet is not yet part of the ERGaR CoO scheme, certificates are currently traded through bilateral agreements. Future export will be carried out through the ERGaR CoO scheme.

Most exports go to Sweden and Germany, in this order and other

Figure 12 Domestic and international exchange of certificates in Denmark and to Germany, Sweden and the rest of Europe (2018-2021)



Source: Energinet

European countries. There are three possible ways for Energinet account holders to transfer their certificates across-borders:

- Ex Domain Export – a cancellation of certificates at the border to Sweden
- Ex Domain Export – a cancellation of certificates at the border to Europe
- Transfer of certificate to the dena biogas registry Germany

By cancelling certificates at the border, Energinet ensures that exported certificates are withdrawn from the Danish market and cannot be used domestically to mitigate double counting. As Sweden does not currently have a registry, Danish authorities have been urging Sweden to establish one to increase transparency and reliability, in order to avoid double subsidy. Further details on this issue will be presented in section 8.7 of this report. Currently, there are no imports into Energinet's registry, however, future transfers will be carried out through the ERGaR CoO scheme once implemented.

## 8.5 United Kingdom

### 8.5.1 Context

In the United Kingdom, there are two voluntary, but government-acknowledged, certification schemes, namely the Green Gas Certification Scheme (GGCS) and the Biomethane Certification Scheme (BMCS). The focus of this report will be on the GGCS as it accounts for a market share of about 80% of British biomethane certificates and it is involved in cross-border exchange.

The Green Gas Certification Scheme (GGCS) is administrated by the Renewable Energy Assurance Ltd (REAL), a not-for-profit company, which also runs a number of other schemes. Their schemes have widespread recognition in the environmental sector, including by government departments and regulators. The scheme began in March 2011.

GGCS certificates for biomethane are referred to as Renewable Gas Guarantees of Origin (RGGOs) although they do not comply with requirements for GOs according to RED I and the UK does not plan on implementing RED II, either. RGGOs are used for different application purposes by producers and traders, for example corporate reporting or domestic feed-in-tariffs. The certificates use a Book & Claim system, with a Mass Balancing function requiring an additional audit. The GGCS has been an ERGaR CoO scheme participant since June 2021.

### 8.5.2 Support mechanisms

There are two main support mechanisms for the consumption of biomethane in the UK: a feed-in tariff and a biofuel quota.

The [feed-in-tariff](#), formerly known as the [Renewable Heat Incentive \(RHI\)](#) is a payment system for the generation of heat from renewable energy sources. The vast majority of the RGGOs issued by the GGCS to date have received the UK Renewable Heat Incentive (RHI) subsidy. The RHI was introduced in 2011 and has stopped accepting new members in 2021.

The UK has since switched to the [Green Gas Support Scheme](#) (2021-2024) which has a similar operation but different tariffs, GHG emission thresholds and duration of contracts. The scheme differentiates between heat generation in domestic and non-domestic buildings. For non-domestic buildings, the feed-in tariff is granted to generators of renewable heat for a period of max 20 years, however for domestic buildings the subsidy period is for max 7 years. The subsidy amount is calculated based on the quantity of renewable heat produced from renewable sources, which biomethane is included in. Generators of renewable heat for non-domestic buildings can receive up to 10.44 £p/kWh for hot water and up to 9.09 £p/kWh for heat. If the feed-in tariff according to the Green Gas Support Scheme has been granted, the biomethane is automatically counted towards the UK's energy targets and therefore cannot contribute to the RED target of EU Member States.

The other main support scheme in the UK is the [biofuel quota: Renewable Transport Fuel Obligation](#) (RTFO). Introduced in 2005, the current RTFO demands 12.4% of transport fuel to be renewable by 2032. Producers of transport fuels are obligated to fulfil the RTFO quota if they supply more than 450,000 liters of fuel in the UK on an annual basis. Suppliers of renewable fuels with a production capacity of less than 450,000 liters a year can register to claim Renewable Transport Fuel Certificates (RTFCs). RTFCs can be traded and sold to other companies obliged to meet the RTFO quota. Biomethane can be used by fuel suppliers to fulfil this quota.

While not a support mechanism for biomethane production, the [Biofertilizer Certification Scheme](#) (BCS) is worth mentioning alongside the above-mentioned incentives. The BCS is a tax exemption alternative for biomethane by-products. The BCS allows biomethane producers to utilize waste products from biomethane production, namely digestate, as biofertilizer on land. This way, biomethane producers do not have to pay for disposal of digestate and therefore benefit from some additional income.

### 8.5.3 Cross-border ownership transfer of certificates

Since June 2021, GGCS is an ERGaR Certificate of Origin (CoO) Scheme participant and all transfers of RGGOs, to and from dena and any other connected registries (AGCS and Vertogas) are conducted via the CoO Scheme and its IT infrastructure.

For imports, GGCS imposes additional requirements on dena in addition to ERGaR CoO requirements. This includes independent audits to confirm criteria related to use of biomass, methane emissions, electricity consumption for upgrading of biogas and use of renewable process heat.

For exports, the transfer to other registries must meet two criteria, although some additional requirements may be in place for specific registries. Firstly, one of the following documents must be made available to the GGCS by the biomethane producer:

- Non-domestic Renewable Heat Incentive (NDRHI)
- Annual Sustainability Report,
- Green Gas Support Scheme (GGSS) Annual Sustainability Report,
- GGCS Data Verification Statement (DVS) or International Sustainability

- Carbon Certification (ISCC) Audit

The purpose of these documents is to provide the GGCS and ERGaR CoO Scheme participants with assurance of a biogas producers' location, production capacity and systems used to record its inputs and outputs. Secondly, the RGGO must have a valid status when the receiving registry accepts the transfer. As the transfer process is likely to take at least 10 working days, the GGCS only accepts transfer requests where the RGGOs are within one month of expiry.

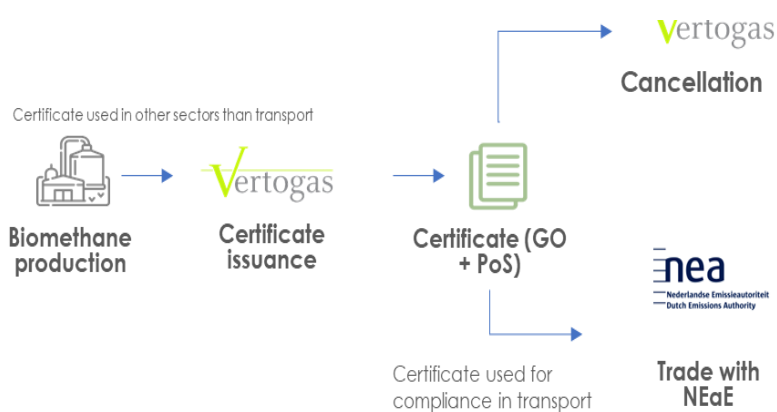
## 8.6 The Netherlands

### 8.6.1 Context

Vertogas is the Dutch certification body responsible for implementing the biomethane and hydrogen GO and PoS scheme in the Netherlands on behalf of the Minister of Economic Affairs and Climate. Vertogas is a subsidiary of Gasunie, the national gas Transmission System Operator. Their biomethane certification scheme has been operational since 2009 while hydrogen is expected to be launched in the third quarter of 2022.

For disclosure, certificates can be traded and have to be cancelled by the consumer. For compliance, to fulfil fuel targets, the certificate needs to be converted to a HBE certificate ("hernieuwbare brandstofeenheid"). This is done by transferring the GO certificate to NEa (the Dutch emission authority) which automatically cancels the certificate, as shown in figure 13.

Figure 13 Vertogas GOs working mechanism



Source: Vertogas

HBEs can only be attained by certificates issued by Vertogas or from biomethane installations that have not received national subsidies. This implies that biomethane produced outside the NL cannot be used for compliance purposes, neither can Dutch biomethane that has received SDE++ (production support), which will be explained in more detail in the next section.

Exchange of certificates is based on a Book & Claim system, much like other EU countries. Vertogas is an ERGaR CoO Scheme participant and therefore engages in cross-border exchange of biomethane with other scheme participants, such as GGCS, dena, and AGCS.

As of the start of 2022, GOs may be used by regulated entities, subject to EU ETS, as evidence that their gas consumption is biomethane without associated GHG emissions in case:

- There is no double counting; the certificates are cancelled and not used by any other party or for any other purpose (such as disclosure).
- The producer and consumer are connected through the same grid.

### 8.6.2 Support mechanisms

The main subsidy scheme in The Netherlands is the **SDE++**, a production subsidy that is allocated based on the unprofitable margin (*onrendable top*) of biomethane compared to natural gas for each kWh injected into the grid. The scheme works on a competitive tender system based on the cost of CO<sub>2</sub> abatement. If granted, it provides a stable revenue for 15 years. Biomethane producers can apply for the SDE++ if they inject biomethane directly into the gas grid. Producers can attain additional revenue by selling their biomethane certificates on Vertogas platform if they are not used in the transport sector to fulfil fuel targets.

Biomethane producers can also use their biomethane for compliance purposes by converting their certificates to **HBE** (*hernieuwbaar brandstofeenheden*). As part of another scheme, HBE prices are set by the supply and demand, which is potentially a risk associated with the volatility of the market and its uncertainties. Therefore, SDE++ is a more certain source of revenue as the cost of the biofuel quota is determined by the market itself.

### 8.6.3 Cross-border ownership transfer of certificates

Export to other EU MS is possible however, import from other EU MS is not (yet) allowed. Vertogas joined the ERGaR CoO scheme in June 2021. The regulatory framework is not yet ready to support imports, however the intent of joining the scheme shows that the regulations will follow shortly.

## 8.7 France

### 8.7.1 Context

The French registry for biomethane certificates is called "Registre des Garanties des Origines biomethane" (RGO). RGO is managed by GRDF, the national gas Distribution System Operator. GRDF is also a member of ERGaR and considers joining the ERGaR CoO scheme. The French registry uses a Book & Claim system for issuing biomethane GOs with the purpose of disclosure, while the currently issued GO-certificates are not yet RED-II-compliant.

To assign the governmental mandate and nominate an Issuing Body for gas and hydrogen Guarantees of Origin, a public tender will be performed. It is estimated to start within the year of 2022. The winner will be awarded with a 5-year license to act as Issuing Body.

The French authorities incentivize biomethane consumption in the transport sector. The publication of the new law on energy and climate reform, which came into effect on November 8<sup>th</sup> 2020, reformed the GO system and rules regarding biomethane in France (see Table below).

For biomethane installations operational before November 9<sup>th</sup> 2020, a distinction in rules is made depending on the application of the biomethane (transport vs. non-transport). For non-transport applications, the GOs are handed over from the biomethane producers to the natural gas suppliers that pay the feed-in tariff. In turn, these suppliers can sell these GOs to consumers or use them to offer green gas contracts. If biomethane is used as biofuel in transport, 75% of supplier profits that are generated from GO sales have to be reimbursed to the national authorities.

For more recent installations, after November 9<sup>th</sup> 2020, different rules apply depending on whether the installation receives public subsidies. If it did receive subsidies, the biomethane GOs are handed over from the biomethane producers to the national authorities for free. If the installation did not receive subsidies, the biomethane GOs are assigned to the biomethane producers that are free to valorize them by selling to a natural gas supplier or directly to the end-consumer.

Table 8 GO system and rules regarding biomethane subsidies

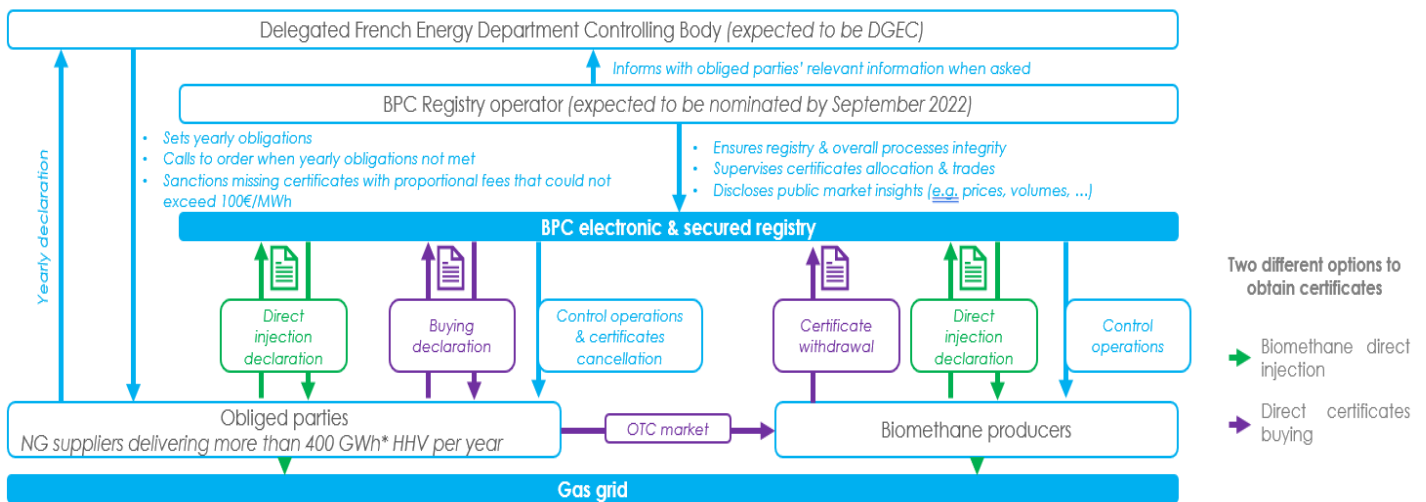
Date of operations	Categories	Explanation	GO owner after issuance
Before Nov 2020	Biomethane is used for non-transport application	GOs are transferred from the producers to the suppliers. These suppliers can then sell the GOs to consumers.	Natural gas suppliers
	Biomethane is used as a biofuel (BioGNV)	75% of supplier profits made by selling the GO have to be reimbursed to the national authorities.	Natural gas suppliers
After Nov 2020	Installations with public subsidies	<p>The biomethane GOs are handed over from the biomethane producers to the national authorities for free. These GOs are used by the national authorities in two ways:</p> <ul style="list-style-type: none"> <li>- To 'greenify' their own municipality's gas consumption</li> <li>- The GOs that are not used by municipalities are sold through an auction.</li> </ul>	Public authorities



Installations without public subsidies	The biomethane GOs are assigned to the biomethane producers that are free to valorize them by selling to a natural gas supplier or directly to the end-consumer.	Biomethane producer
--	--	---------------------

As per July 2023, the French government is expected to implement a new biomethane certification scheme called “Certificat de Production de Biométhane”/“Biomethane Production Certificate” (CPB/BPC). All natural gas suppliers should be considered as obliged parties by 2028. Producers can satisfy their yearly obligations either by directly injecting biomethane into the grid or by buying BPCs from biomethane producers on an over-the-counter (OTC) market, as shown in figure 14. The associated GHG emissions savings can be used by the final consumer on the EU-ETS market.

Figure 14 French Biomethane Production Certificate Scheme that will be implemented in 2023



Scheme based on our interpretation of the decree published on the 22 April 2022 setting the basis of the dispositive

On a yearly basis, suppliers must declare a certain number of certificates to be cancelled to satisfy their obligation according to the new certification scheme. Once cancelled, the certificate can be used by the supplier for disclosure purposes.

Suppliers that do not match their obligation are charged with a proportional sanction system that could go up to 100 €/MWh.

### 8.7.2 Support mechanisms

Biomethane producers benefit from feed-in tariffs (FiT) between 46 and 139 €/MWh, depending on the size of the installation and type of feedstock (e.g., municipal solid waste, food waste, wastewater treatment residues or drinking water treatment residue). These feed-in tariffs are paid by TSOs as a mandatory obligation.

The FiTs and their rules have changed (slightly) for biomethane installations that became operational after 9<sup>th</sup> of November 2020, similar to the previously mentioned GOs rules.

### 8.7.3 Cross-border ownership transfer of certificates

Currently, France does not allow for cross-border trade of renewable gas certificates. The market is expected to be opened in the coming years.

## 8.8 Sweden

### 8.8.1 Context

In Sweden, there is currently no biogas registry or independent certification system for biomethane or hydrogen. A national biomethane and hydrogen GOs system has been announced in 2019. The implementation is expected to be carried out by the Swedish Energy Agency (SEA).

The concepts of Mass Balancing and sustainability criteria are being used to manage CO<sub>2</sub> and energy tax exemptions for green gas consumers since 2011. This is done through a regulatory framework referred to as the 'green gas concept'. This allows biomethane consumers connected to the gas grid to buy and claim any share of biomethane even if it is a physical mix of natural gas and biomethane. Each product is regulated by the designated authority, as shown in Figure 15.

The working principle is further detailed below. The biomethane volumes need to be evidenced by purchasing contracts between the end-user and the supplier, given the supplier must provide evidence that the amount has been injected to the grid. Companies can either use in-house accounting (most common) or third-party auditing as evidence for the amounts they inject (or that is injected on their account) and offtake. The Tax Authority can

Figure 15 Respective regulating bodies for Swedish biogas products

Topic	Regulating body
Mass balancing	Swedish Tax Authority
Sustainability criteria	Swedish Energy Agency
Support	Swedish Tax Authority
Guarantee of Origin Issuing body (under development)	Swedish Energy Agency

request the above-mentioned evidence from all taxable companies. The same rules apply for local gas grids in Sweden that are not physically interconnected. If the biomethane is bought in another country, and transported to Sweden through the grid, cross-border capacity must be booked.

All suppliers of biofuels (including gaseous fuels) must have a Sustainability Decision that proves compliance with the sustainability criteria of RED II. This Sustainability Decision is a precondition to be eligible for tax exemptions or for the biomethane to be counted in other support systems, such as the GHG reduction obligation for gasoline and diesel, green electricity certificates or EU ETS. The Sustainability Decision can be achieved in two ways: either by certification through a Voluntary Scheme approved by the European Commission or an application for a Sustainability Decision by the Swedish Energy Agency. For an application for a Sustainability Decision, the supplier must set up a control system covering the whole supply chain - including agreements with sub-suppliers, regular

sampling and auditing, and a Mass Balance system, that assures the biofuel supplied meets the sustainability criteria. A statement from an independent auditor assuring that the control system fulfils the requirements must be sent to the Swedish Energy Agency, together with the application. Every year in April, the supplier must report the amounts of sustainable biofuels delivered along with their sustainability characteristics to the Swedish Energy Agency. The Sustainability Decision is reviewed approximately every second year by the Swedish Energy Agency, based on independent auditing of the control system including samples of actual biofuel consignments delivered.

### 8.8.2 Support mechanisms

In Sweden, there are support schemes for consumption and production of biomethane.

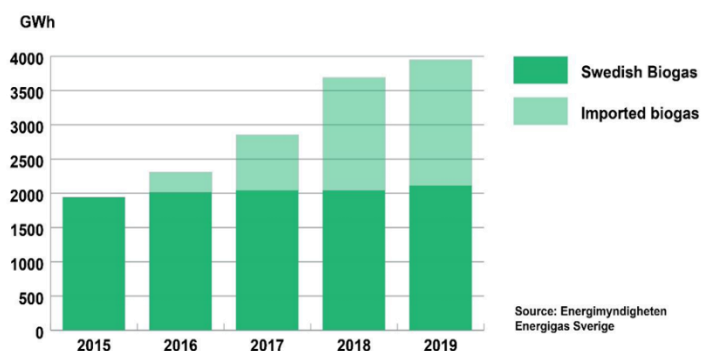
Schemes for consumption come in the form of CO<sub>2</sub> and energy tax exemptions for biomethane and biogas. The type of exemptions and their valorization depend on the application. For example, the transport sector receives exemption from the energy tax and CO<sub>2</sub> tax for biomethane as a transport fuel.

The value of the biomethane tax exemption can be estimated with the corresponding tax for petrol. The CO<sub>2</sub>-tax for petrol is 2.61 SEK/liter (~29 €/MWh) while the energy tax is 4.13 SEK/liter (~45 €/MWh). Another exemption from CO<sub>2</sub> and energy tax for biogas or biomethane is granted for heating fuel (including industrial use). For industrial activities included in the EU ETS, such use is also exempted from 100 percent of the CO<sub>2</sub> tax. The corresponding tax on natural gas is 3584 SEK/1000 Nm<sup>3</sup> (~32 €/MWh). Lastly, CO<sub>2</sub> and energy tax exemption are given for CHP plants. Natural gas, and other fossil fuels, for such use within the EU ETS, are exempt from 9% of the CO<sub>2</sub> tax.

Available support schemes for production are feed-in-tariffs: 0.20 SEK/kWh (~20 €/MWh) production support for manure-based biogas and biomethane. There are more financial incentives for consumption of imported biomethane than production schemes. Moreover, imported biomethane is generally cheaper due to production support in Denmark and Germany. This is why there have been increased amounts of biomethane imports and overall consumption, while domestic production has stagnated.

The Swedish government has tried to change this situation by implementing production support, but the subsidies seem to be insufficient to create a change.

Figure 16 Swedish biogas use between 2015- 2019



### 8.8.3 Cross-border ownership transfer of certificates

In 2017, an EU Court of Justice ruling has opened up the Swedish market for imports of biomethane certificates from Denmark through Mass Balancing. Producers who wish to export their certificates must use Voluntary Schemes for certification. For imports, compliance can be proven by Voluntary Scheme certificates (most common) or validation of the Sustainability Decision application by the Swedish Energy Agency proving that the supplier's control systems have sufficient routines that can assure RED compliance along the entire supply chain. If the biomethane is bought in another country, and transported to Sweden from Denmark through the grid, cross-border capacity from the injection point must be booked. In case the above conditions are fulfilled, imported certificates can be used for tax exemption purposes.

Figure 17 Swedish administrative order context and implications

In 2013, the Swedish National Energy Agency issued an administrative order to E.ON. Biofor, a company established in Sweden and importer of biogas from its sister company established in Germany, to modify its Mass Balance methods with regards to biogas.

The Swedish authority argued that to comply with the Swedish laws transposing RED I, E.ON. Biofor's Mass Balance methods had to apply 'within a geographical location with precise boundaries', namely the Swedish geography. As a result, the biogas produced and imported from Germany could no longer be qualified as biomethane and, therefore, was not eligible to tax reductions guaranteed for the producers of biofuels in Sweden.

E.ON. Biofor successfully sought the annulment of the administrative order by the Swedish Administrative Court and a ruling by the European court of Justice followed in October 2017. The Court's ruling showed that while the Swedish administrative order limited Mass Balance to a geographical location with precise boundaries, such condition was considered a territorial restriction that hindered free movement of biomethane and, therefore, was a gross violation of the Article 34 TFEU (i.e. free movement of goods).

Source: Florence School of Regulation

## 8.9 Austria

### 8.9.1 Context

Austria has three registry systems for different application purposes of biomethane (AGCS Biomethane Register Austria, GO database of E-Control, eINA Biofuel Registry). AGCS Gas Clearing and Settlement AG is responsible for the imbalance energy market in Austria and has been operating the Biomethane Registry since 2012. AGCS issues monthly Biomethane Certificates on basis of metering values and clearing data. According to the Renewable Electricity Act (ÖSG 2012, Ökostromgesetz), AGCS biomethane certificates are the basis for the renewable power feed-in tariff. The government mandated the issuing of "monthly confirmations with a unique identification code on the injected biogas [biomethane] quantities for the Green Power Settlement Agent [OeMAG Abwicklungsstelle für Ökostrom AG] and on its account".

Additionally, the AGCS Biomethane Registry Austria provides a holistic tracking system to the gas market. Once a certificate is issued, producers may decide on their own account how to market the green value of their renewable gas product into one of the following application purposes.

- [For electrification](#): FiT paid to CHP plant operator by OeMAG
- [As biofuel](#): recorded with PoS in eINa
- [To suppliers for consumer disclosure](#): recorded as GO by E-Control in the future
- [Free/voluntary market in Austria and cross-border](#).

The responsibility for power and gas GOs lies with the energy regulator E-Control and the establishment of the gas GO system and issuing body system is under development.

The Austrian Biofuel Registry, called "eINa" is operated by the Austrian Environmental Agency (Umweltbundesamt). AGCS and eINa have an ongoing cooperation agreement since 2016 allowing for data and information exchange. While a cooperation agreement is unique in Europe it also is an important measure to remedy potential double counting of energy amounts.

The Renewables Expansion Act (EAG 2021, Erneuerbaren Ausbau Gesetz) requires the three Austrian registry operators (E-Control, AGCS, eINa) to enter into cooperation to "ensure proper processing of data transfers in order to exclude double counting", as the legal text from § 81 (8) EAG translates.

### 8.9.2 Support mechanisms

There are no direct national support schemes for biomethane production but there are diverse incentives for renewable gas use, scattered over different legal acts. Firstly, the [feed-in tariff for renewable power from biogas and biomethane](#) is in place (ÖSG) but it is currently being phased out. Plants with ongoing support contracts may receive the FiT beyond 2030. Secondly, multiple incentives exist without practical implementation yet. Some of these include:

- [Market premiums](#) for renewable power from biogas, which is restricted to specific installations and is not applicable to decentralized biomethane electrification;
- [Investment support](#) for plants that convert biogas into biomethane and for newly installed biomethane plants;
- [Natural gas tax rebate](#);
- [Exemption of CO2 pricing](#) (via reimbursement of natural gas tax) in the National Emission Trading System.

These incentives have been mapped out in terms of legislation but are outstanding implementation. In the future, a [Green-Gas-Quota](#) for gas suppliers is anticipated, however, it requires new legislation.

### 8.9.3 Cross-border ownership transfer of certificates

Ownership transfer of certificates is done either through the ERGaR scheme or via ex-domain cancellations performed by market participants through AGCS's system. The bilateral agreement between AGCS and dena, signed in July 2017, for cross-border exchanges and ownership settlement was the first of its kind in Europe and has been replaced by the ERGaR CoO scheme in 2022. Around 10 GWh of biomethane certificates are annually exported from Austria to Germany.

AGCS may import and export certificates from any partner registry who is an ERGaR CoO scheme participant. Market participants also export on their own terms via Ex Domain Export – a cancellation of certificates at the Austrian border – for example, to Switzerland. Importers and exporters need a registered account in the AGCS registry. However, the system for acceptance of imported certificates as a GO (for disclosure) and PoS (for target compliance) is still under development and depends on the respective competent authority.

## 8.10 Italy

### 8.10.1 Context

The Italian legislative framework regarding biomethane certification is still under development. There are two important organizations who are likely to be involved in the implementation of the biomethane registry, namely Gestore Servizi Elettrici (GSE) and Consorzio Italiano Biogas (CIB). Their roles and responsibilities in this activity are not yet certain.

Currently, Gestore Servizi Elettrici (GSE) is responsible for the issuing of certificates of consumption (Certificati di Immissione in Consumo - CIC) which is the main subsidy scheme in place. GSE also is the power GO Issuing Body. It is possible that GSE will also play a role in the implementation of the biomethane GO Issuing Body in the future.

Consorzio Italiano Biogas (CIB) is the industry representative body for biogas and biomethane producers since 2006. CIB has communicated in the press that it intends to implement and operate a biomethane registry on a voluntary basis. According to latest publicly available information, the CIB board approved the registry's business plan in 2021 but there has been no publicly available news on the implementation since. CIB is a member of ERGaR, but has not adopted the CoO scheme.

### 8.10.2 Support mechanisms

The biomethane support scheme is based on the certificates that can be used to fulfil biofuel targets, namely CICs. Generally, one CIC is granted for every 10 GCal of biomethane produced. However, for specific feedstocks, one CIC is granted for every 5 GCal. Biomethane is considered “advanced” if it is produced using specific feedstocks, including organic fraction of municipality solid waste, manure, agricultural by-products, etc. In such a case, the biomethane producer can choose two options.

- **For subsidies CIC:** The producer can request subsidies for the first ten years of operation. These subsidies are equal to the gas price on the spot market, reduced by 5 %. In addition, GSE will provide subsidies of 375 € for each CIC belonging to the producer.
- **For market value CIC:** The producer can decide to sell the CIC.

Furthermore, producers can benefit from **premiums** on top of the CIC scheme if the biomethane comes from specific biomass e.g., cover crops, manure, agricultural by-products, etc. It is possible to receive an additional premium for electricity produced by CHP plants using biomethane on top of receiving the CIC subsidy.

### 8.10.3 Cross-border ownership transfer of certificates

Currently, it is not possible to import biomethane in Italy from foreign countries because the biomethane decree indicates the need to sign bilateral agreements between the nations that carry out the transaction while there are currently no agreements in place.

## Reference list

- AGCS, (2022). Retrieved from <https://www.agcs.at/de>
- CIB, (2022). Retrieved from <https://www.consorziobiogas.it/en/home-2/>
- Directive (EU) 2009/28/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL., (2018). Retrieved from [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L\\_.2018.328.01.0082.01.ENG&toc=OJ:L:2018:328:TOC](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.328.01.0082.01.ENG&toc=OJ:L:2018:328:TOC)
- Directive (EU) 2018/2001 of the European Parliament and of the Council, (2018). Retrieved from [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L\\_.2018.328.01.0082.01.ENG&toc=OJ:L:2018:328:TOC](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.328.01.0082.01.ENG&toc=OJ:L:2018:328:TOC)
- Decorte, M., Tessens, S., Fernández, D., Repullo, F., McCarthy, P. J., & Oriordan, B., (2020). Mapping the state of play of renewable gases in Europe. REGATRACE D6, 1. Retrieved from <https://www.regatrace.eu/wp-content/uploads/2020/02/REGATRACE-D6.1.pdf>
- Dena. (2022). <https://www.dena.de/themen-projekte/projekte/erneuerbare-energien/greengasgrids-gruenes-gas-fuer-europa/>
- Department of Transport, (2022). *RTFO Guidance for Biomethane, Including as a Chemical Precursor*. Retrieved from [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1042782/rtfo-guidance-for-biomethane-including-as-a-chemical-precursor.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1042782/rtfo-guidance-for-biomethane-including-as-a-chemical-precursor.pdf)
- Edel, M., Belin, F., Königsberger, S., Wolf, A., Keuschnig, F., AlB, K. V., ... & Reinholz, T., (2021). D4. 2 Technical and operational comparison of the biomethane/renewable gas GO system and the electricity GO system. Retrieved from <https://www.regatrace.eu/wp-content/uploads/2021/04/REGATRACE-D4.2.pdf>
- Energinet, (2022). Retrieved from <https://energinet.dk/>
- ERGaR. (2020). Retrieved from <http://www.ergar.org/ergar-coo-scheme/>
- Florence School of Regulation, (2022). <https://fsr.eui.eu/>
- Gestore Servizi Energetici, (2022). Retrieved from <https://www.gse.it/en>
- Green Gas Certification Scheme, (2022) Retrieved from <https://www.greengas.org.uk/>
- Nederlandse Emissieautoriteit Dutch Emissions Authority, (2022). *Booking Renewable Energy for Transport 2022-2030*. Retrieved from



<https://www.emissieautoriteit.nl/onderwerpen/inboeken/inboeken-gasvormige-hernieuwbare-brandstof>

United Nations Climate Change, (2021). *Denmark National Inventory Report*. Retrieved from <https://unfccc.int/documents/273129>

United Nations Climate Change, (2021). *National Inventory Submissions 2021*. Retrieved from <https://unfccc.int/ghg-inventories-annex-i-parties/2021>

Vertogas, (2022). Retrieved from <https://www.vertogas.nl/>