An Coimisiún um Rialáil Fóntas
Commission for Regulation of Utilities

Fuel Mix Disclosure and CO2 Emissions 2022

Information Paper

Reference:	CRU2023133	**Date Published:**	14/11/2021	**Closing Date:**	N/A

The Exchange, Belgard Square North, Tallaght, Dublin 24, Ireland
T +353 1 4000 800 | F +353 1 4000 850 | www.cru.ie

CRU Strategic Plan 2022 – 2024

Our Mission

- Protecting the public interest in water, energy, and energy safety.

Our Vision

- Safe, secure, and sustainable supplies of energy and water, for the benefit of customer now and in the future.

Our Strategic Priorities

- Ensure Security of Supply
- Drive a Low Carbon Future
- Empower and Protect Customers
- Enable our People and Organisational Capacity

Executive Summary

The fuel mix and carbon dioxide (CO2) emissions disclosure for 2022 provides Irish consumers the recent fuel mix information and environmental impact of the electricity that they buy, compared to the All-island average. The fuel mix and CO2 figures, as published in this paper, are for a supplier's total customer base rather than on an individual customer basis. As such, they represent a supplier's average fuel mix and not that of a specific product that the supplier is selling. The renewable generation supported by the supplier can be from anywhere in the European Economic Area (EEA) Member States[1] and not just generated in Ireland.

The publication of the fuel mix of Irish suppliers and the provision of information regarding the environmental impact of electricity produced from that fuel mix is required by Article 3(9) of Directive 2009/72/EC. It is the role of Single Electricity Market Operator (SEMO) to administer and calculate the fuel mix figures from the information provided by suppliers licenced in Ireland. The supplier fuel mix and associated environmental impact information (emissions intensity) is calculated by SEMO in accordance with the SEM Committee's methodology, found in "*Fuel Mix Disclosure in the Single Electricity Market: Calculation Methodology Decision Paper"* (SEM/11/095). Suppliers must make a submission to SEMO in order to have their own bespoke fuel mix calculated. If they choose not to make a declaration, they will be allocated[2] to the residual fuel mix. The residual fuel mix is the fuel mix which is left over from the All-Island fuel mix after individual supplier's fuel mixes have been calculated.

It should be noted that the fuel mix of each electricity supplier (outlined in this paper) does not necessarily represent metered generation in Ireland, as suppliers may include the green attributes, i.e., Guarantees of Origin (GOs) certificates[3], which are imported from other EEA Member States. Irish suppliers are permitted to purchase green attributes, i.e., GOs, and use them to offset CO2 emissions, and confirm to their final customers in Ireland that the share or quantity of electricity they used came from renewable generators across the EEA Member States.[4] In 2022, on an All-island basis, 17,711,837 GO certificates were imported,

[1] The European Economic Area (EEA) is made up of the Member States in the EU and additionally Norway, Lichtenstein, and Iceland.
[2] In Ireland suppliers are allocated the residual mix less any PSO adjustment that they are entitled to.
[3] The CRU notes that the existence of GOs, and their application across the European Union (EU), is a long-established system, which has supported the addition of renewable generation across the EU.
[4] Where a supplier tariff refers to 100% green electricity, this relates to contractual support for renewables; in other words, over the year, for every unit of electricity supplied, that supplier has given contractual support for a corresponding unit of electricity. It is worth noting that in any given moment that electricity supplied may or may not come from renewable sources (e.g., low wind and no solar at night), nevertheless as above the 100% green electricity is supported over the year.

a 2% increase from the previous year. This means that the fuel mix and CO2 emissions presented on a bill by an Irish supply company may display a higher percentage share of electricity derived from renewable sources than would otherwise be displayed if it was solely on the basis of the actual generated-in-Ireland renewable share of the supplied electricity.

There is a responsibility (see Section 5 for details) on suppliers to explain the fuel mix and CO2 emissions of its individual products to customers as well as providing clear marketing information. For those suppliers operating in Ireland who offer specific "Green Source Products", but whose overall average fuel mix, to include all offered electricity products, is not 100% renewable, the CRU has a verification process[5] to ensure the accuracy of the green claims. The results for 2022 of this process are published in a separate "Green Source Product Verification Report".

The CRU notes that the existence of GOs, and their application across the European Union (EU), is a long-established system, which has supported the addition of renewable generation across the EU. However, the CRU recognises that this approach is a slightly difficult process for electricity consumers in Ireland to understand. As such, the CRU will be proposing some changes to the approach for the future mix disclosure in order to provide greater transparency regarding GOs for Irish electricity consumers.

In the previous FMD publications, participants were provided with an update on GOs and REGOs arrangements in the EU and UK. Insofar that the CRU is made aware, the CRU will provide market participants with an update on any changes to any future FMD processes, should subsequent communications or agreements from either the EU or UK authorities indicate a change in the current policy.

[5] Regulation of Green Source Products in the Electricity Retail Market: CER/15/205

Public Impact Statement

The fuel mix disclosure shows Irish electricity consumers the fuels which were used in the generation of the electricity they purchase from their suppliers.

This fuel mix disclosure by supply companies licenced in Ireland permits electricity consumers to distinguish between suppliers based on the fuel source of their electricity and the associated CO2 emissions, and to compare it with the All-Island average.

Table of Contents

Glossary of Abbreviations and Terms

Abbreviation or term	Definition or meaning
AIB	Association of Issuing Bodies
CRU	Commission for Regulation of Utilities
CO2	Carbon dioxide
DfE	Department for the Economy
EEA	European Economic Area
EECS	European Energy Certificate System
EPA	Environmental Protection Agency
EU	European Union
FMD	Fuel Mix Disclosure
GB	Great Britain
GO	Guarantee of Origin
gCO2/kWh	Grams of carbon dioxide per kilowatt hour
GSPV	Green Source Product Verification
kWh	Kilowatt hour
MWh	Megawatt hour
NI	Northern Ireland
NIRO	The Northern Ireland Renewables Obligation
PSO	Public Service Obligation
IE	Ireland
SEM	Single Electricity Market
SEMO	Single Electricity Market Operator
UK	United Kingdom
UR	Utility Regulator

1. Introduction

1.1 Commission for Regulation of Utilities

This section summarises the relevant context and background for the Commission for Regulation of Utilities (CRU) responsibilities with regards to fuel mix and CO2 emissions information on all bills and promotional materials issued by Irish electricity suppliers to their electricity customers.

This information paper presents the recent fuel mix information and environmental impact of the electricity that Irish customers buy, compared to the All-island average.

1.2 Background

1.2.1 What is Fuel Mix Disclosure?

The purpose of Fuel Mix Disclosure (FMD) is to provide electricity consumers with the information necessary to distinguish between electricity supply companies based on their individual fuel mix and their emissions data and as compared with the All-Island average. It is the annual publication of the mix of fuels involved in electricity production on a per-supplier basis, following an All-Island process (SEM/11/095).

Electricity suppliers licenced in Ireland with retail customers have to submit a fuel mix declaration to SEMO so that a representative fuel mix can be calculated and disclosed. Additionally, non-retail self-suppliers[6] can also choose to make a declaration in order to have their individual fuel mix calculated if they wish.

FMD calculations are carried out on a calendar year basis by SEMO on behalf of the CRU. In addition, the CRU publishes CO2 emissions intensity data for each supplier, as calculated by SEMO. The verification of the data which forms the basis of each supplier's FMD is carried out independently, so consumers can be confident about the validity of the published FMD figures for each individual supply company.

The FMD calculation is the only way of independently verifying the source of electricity that suppliers claim to provide to their consumers, consequently enabling consumers to choose

[6] A self-supplier is a supply company which supplies electricity only to its own site and which does not compete to supply energy to any third party.

a company which is supplying low carbon-intensive energy or even zero emissions (which may include renewable Guarantees of Origin (GO) certificates being taken into account).

All suppliers (with retail customers) are obliged to present FMD data on their bills and promotional materials even if they did not declare fuel mix data to SEMO for FMD calculation. Suppliers that did not submit declarations to SEMO, in accordance with SEMO's process, have to disclose, or reflect on their bills, the residual fuel mix, less any Public Service Obligation (PSO) adjustment that they are entitled to, i.e., what is left over after all the individual supplier fuel mixes are calculated.

1.2.2 All-Island Mix

The All-Island fuel mix is the mix of fuels involved in the generation of the electricity supplied to customers on the island of Ireland as a whole, to include both jurisdictions: Ireland (IE) and Northern Ireland (NI).

In accordance with SEM/11/095, the fuel mix figure for each supplier has been calculated on the basis of a combination of:

- non-renewable generation attributes;
- Guarantees of Origin (GOs);
- renewable generation attributes assigned to a supplier that are not included in the GO scheme; and
- the Residual Mix[7] or European Union (EU) Residual Mix.

1.2.3 Residual Mix

The Residual Mix is calculated for IE, for NI, and on an All-Island basis. Basically, it is the mix of all unclaimed electricity in the system. It is calculated as the sum of:

- Any generation attributes not assigned to, and submitted by, a supplier;
- Surplus GOs declared by suppliers; and

[7] The Residual Mix is the mix of all unclaimed electricity in the system. It is measured by taking the total metered generation both In-SEM and Out-of-SEM, and deducting from this the four categories of energy that can be claimed by a supplier, in the following order: Public Service Obligation (PSO) energy; Guarantees of Origin (GOs); Renewable Energy Guarantees of Origin (REGOs); Generator Attributes – total amount of non-renewable generation from a fossil-fuelled unit registered by a supplier to be tracked by the calculating body.

- Unused (deemed cancelled) certificates which expired in the relevant Disclosure Period[8].

At a European level a residual mix is also calculated. The European Residual Mix is a combination of the residual fuel mixes from all the EEA Member States, but again, these mixes do not need to follow the physical flow of electricity.

If the All-Island demand including exports is greater than the sum of all the suppliers' declarations plus the local Residual Mix, the European Residual Mix is applied to the remaining demand and included in the All-Island Residual Mix. In the case that demand is less than the sum of all the suppliers' declarations the surplus claimed generation attributes will be included in the European Residual Mix.

1.2.4 Fuel Sources

The electricity that is provided to homes and businesses to meet demand using a number of different fuel sources. It is these different fuel sources that make up the fuel mix.

The main fuel sources for electricity generation in Ireland are:

- Natural Gas;
- Renewables;
- Coal;
- Oil;
- Other (Waste to Energy and Peat).

In the case of electricity generated from waste, the renewable portion (as is derived from the biomass content of the waste) is included under the "*Renewables*" fuel mix category. The non-renewable portion of electricity generated from burning municipal waste is categorised as "Non-Biodegradable Fraction of Waste". However, in 2021, the contribution of both peat and waste to energy to the All-Island Mix are each below 1%, so for the purposes of this report they are grouped in the category labelled as "*Other*".

Fuels categorised as "*Renewables*" are all those that comply with the list of fuels defined under the term "Energy from Renewable Sources" in S.I. no.147 of 2011. These consist of:

- wind;

[8] See Section 1.2.5 entitled "GOs" for details.

- solar;
- aerothermal;
- geothermal;
- hydrothermal and ocean energy;
- hydropower;
- biomass;
- landfill gas;
- sewage treatment plant gas; and
- biogases.

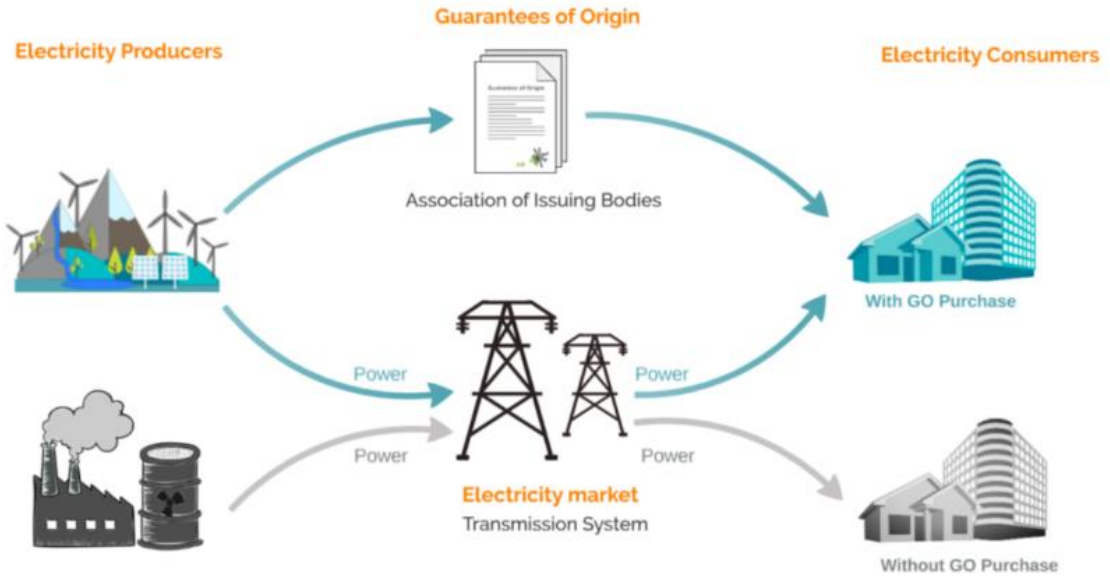
1.2.5 Guarantees of Origin (GOs)

As part of the fuel mix, suppliers may include the green attributes of renewable electricity generated outside of Ireland through electronic certificates known as Guarantees of Origin (GOs), which may be imported from other EEA Member States. The Association of Issuing Bodies (AIB)[9] operates a hub which tracks certificates traded between countries. AIB also ensures that electricity tracking does not lead to double counting. The hub allows suppliers to purchase (or sell) the renewable benefit of certain generators across Europe and include it in their total fuel mix. GOs are both exported from SEM and imported to SEM from the rest of Europe.

A Guarantee of Origin (GO) is an energy electronic certificate defined in the European Directive 2018/2001/EC (and its predecessors 2009/28/EC and 2001/77/EC). GOs can be freely traded between the European Economic Area (EEA) Member States[10], as accepted by the EU law. Guarantees of Origin aim is to show to a final energy customer that a given share or quantity of energy was produced from renewable sources, including promoting the generation of electricity from renewable sources in the EEA Member States.

[9] The AIB promotes the use of a standardised system, known as the European Energy Certificate System (EECS) which is based on harmonised environment, structures, and procedures in order to ensure the reliable operation of international energy certificate systems.
[10] The European Economic Area (EEA) is made up of the Member States in the EU and additionally Norway, Lichtenstein, and Iceland.

Figure 1: GO role in electricity market.

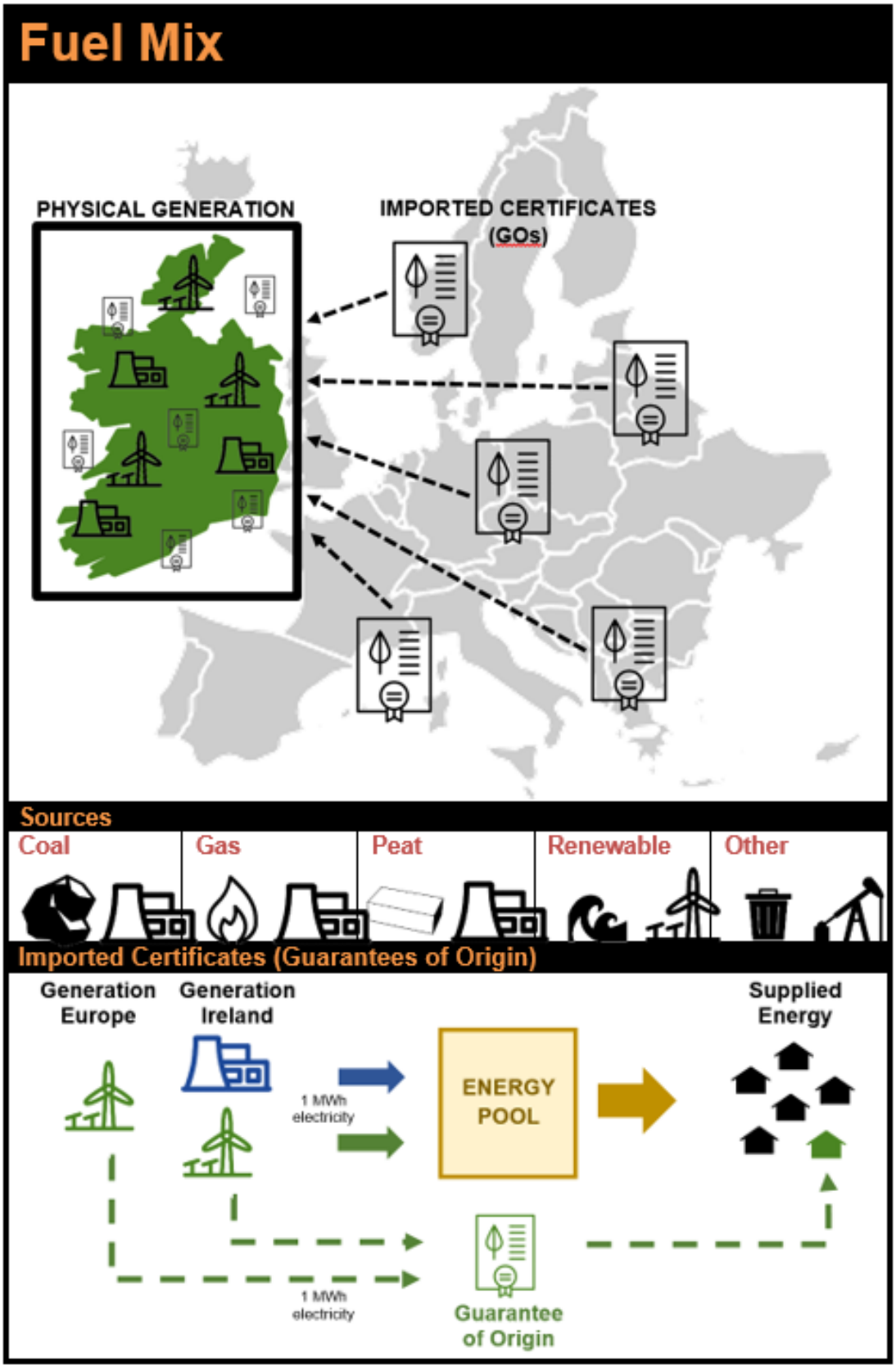


Each GO unit represents one Megawatt hour (MWh) of renewable energy produced and is issued once a month at the request of the producer for each MWh of electricity fed into the network. When renewable power plants in the EEA Member States produce 1 MWh of renewable energy, a GO certificate can be issued for that produced unit of renewable energy.[11] The certificate would state how, where and when that unit of green energy was produced. Issued GOs have the following information:

- Source of the energy;
- Dates when it was produced;
- Identity, location, type, and capacity of the production facility;
- Whether the GO relates to electricity or heating or cooling;
- Whether and to what extent the installation has benefited from support;
- Date when the installation became operational;
- Date and country of issue; and
- Unique identification number.

[11] A GO is only allowed to be used once and cannot be duplicated or copied.

Figure 2: GO scheme arrangements in Ireland and Europe.



GO certificates automatically expire 12 months from the end of the month of production of electricity. Suppliers have to use GO certificates before they expire and declare what

disclosure year the certificates are going to be used for. GO certificates can only be used for FMD for the year they were issued or the following disclosure year, i.e., GOs corresponding to production in January 2021 could have been used for the 2021 or 2022 FMD. Once a GO has been declared for a disclosure year, it is terminated and cannot be used again.

GOs do not directly impact the sale of electricity, nor does it affect the flow in the Irish electricity grid, as they are not tied to the physical delivery of electricity. By purchasing GO certificates from the EEA Member States, Irish suppliers can demonstrate that the electricity they sold to their final customers comes from a renewable source. There could be cases where Irish electricity suppliers sell renewable electricity without actually directly procuring or generating renewable energy kilowatt hour (kWh) in Ireland. As such, GO certificates can allow electricity suppliers and large energy users to reduce their carbon footprint and meet renewable energy targets, i.e., to ensure that their entire electricity sold or consumed comes solely from renewable sources. In this case, often the calculated overall FMD for Ireland may have a higher percentage share of the renewable fuel source category than the share which would otherwise be indicated by the actual physical generation of renewable electricity in it.

In 2022, on an All-island basis, 17,711,837 GO certificates were imported, a 2% increase from the previous year (see Appendix 3 for details).

1.3 Statutory Requirement

Fuel Mix Disclosure (FMD) is required by Article 3(9) of Directive 2009/72/EC. The requirements in this Article is now repealed and is now recast as Directive (EU) 2019/944.

The publication of the fuel mix of suppliers and the provision of information regarding the environmental impact of electricity produced from that fuel mix is required by Article 18(6) and point 5 of Annex I of Directive (EU) 2019/944.

The transposing legislation in Ireland, S.I. number 60 of 2005, requires the CRU to guarantee that electricity suppliers provide reliable fuel mix information on all bills and promotional materials issued to Irish electricity customers.

The SEM Committee Decision Paper (SEM/11/095) sets out the methodology for calculation of the fuel mix. Electricity suppliers publish their own fuel mix information, as well as the All-Island information, on all bills no later than two months from the publication of this Information Paper. This provides electricity consumers of Ireland with information on the

recent environmental impact of electricity from their supplier compared with the All-Island average.

1.4 Purpose of Paper

This Information Paper sets out the electricity fuel mix and carbon dioxide (CO2) emissions figures for 2022 on an All-Island (Ireland (IE) and Northern Ireland (NI)) basis as well as by electricity supplier licensed in IE and operating during 2022 in the All-Island Single Electricity Market (SEM). The fuel mix and CO2 emissions data are taken from data provided to the CRU by the Single Electricity Market Operator (SEMO).

1.5 Related Documents

- SEM/22/065: All-Island Fuel Mix Disclosure and CO2 Emissions 2021.
- CER/15/205: Regulation of Green Source Products in the Electricity Retail Market.
- SEM/11/095: Decision paper on the Fuel Mix Disclosure in the Single Electricity Market.
- CER/11/824: Decision on Supervisory Framework for Administration of Guarantees of Origin.

1.6 Structure of Paper

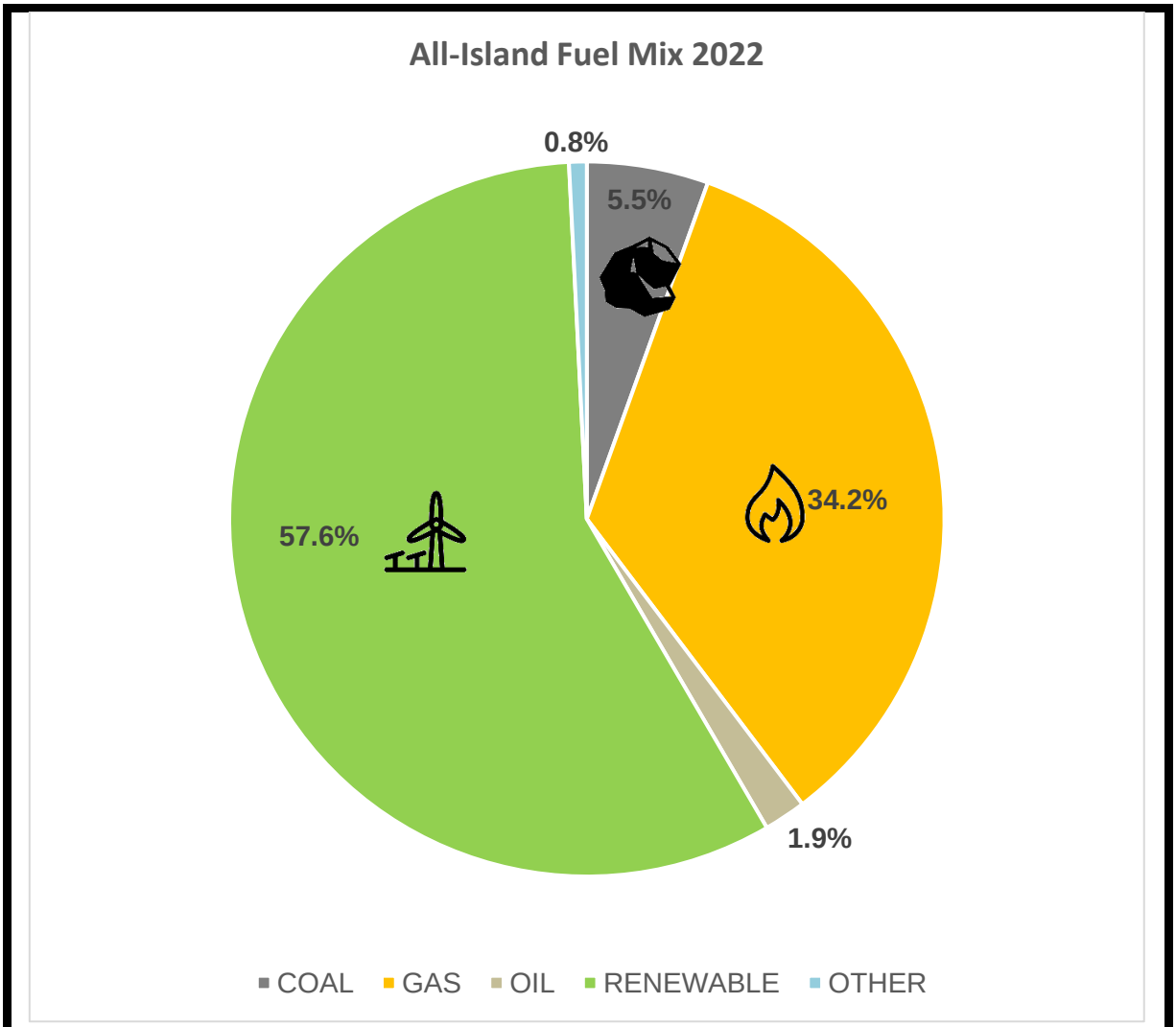
This information paper is structured as follows:

- **Section 1:** introduces the CRU and provides background to this information paper.
- **Section 2:** presents the All-Island Fuel Mix;
- **Section 3:** shows the average All-island CO2 emissions;
- **Section 4:** presents the individual Fuel Mix of electricity suppliers licenced in Ireland; and
- **Section 5:** Outlines suppliers' obligations as relates to disclosing their fuel mix.

2. All-Island Mix

This section sets out the 2022 and year-on-year fuel mix for the All-island SEM, i.e., on average across the island.

Figure 3: All-Island Fuel Mix 2022 (inclusive of green attributes, i.e., GOs).



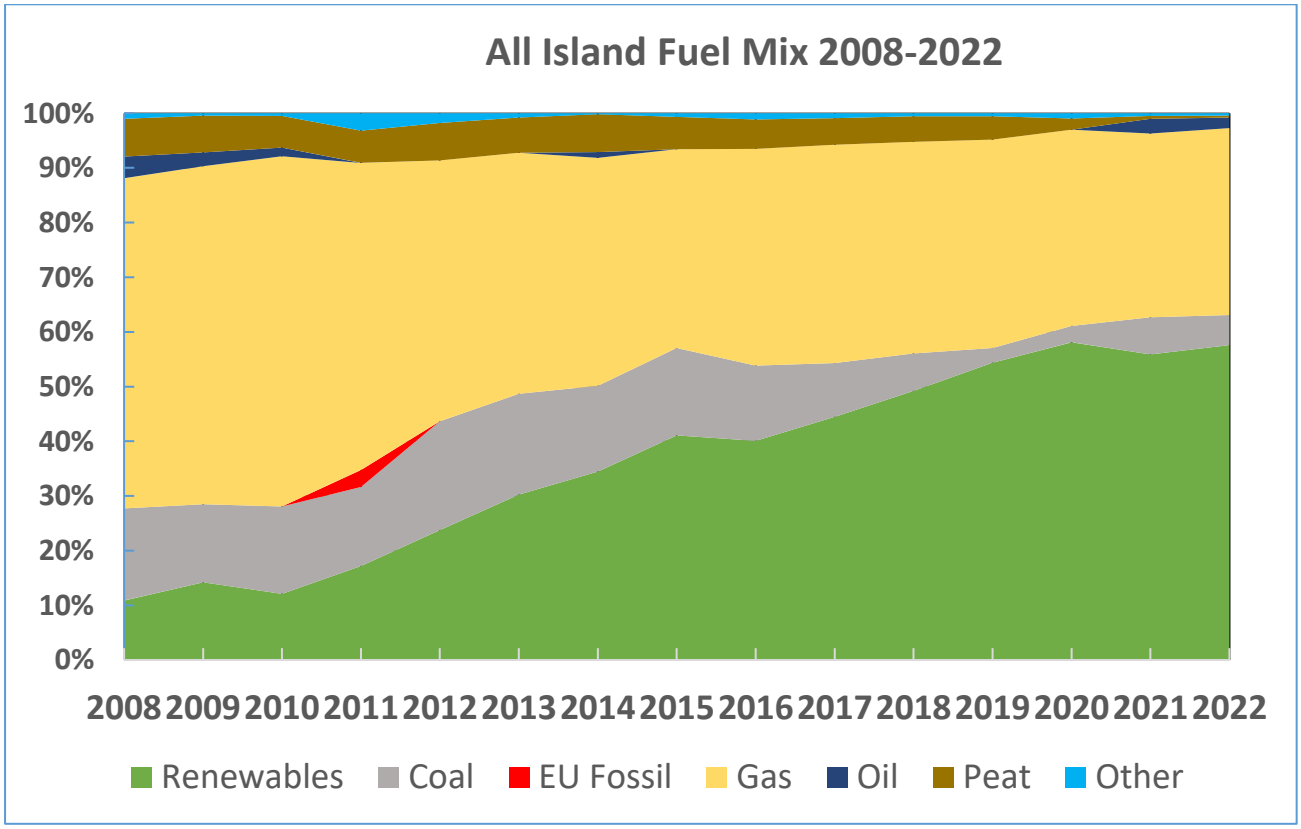
Fuel Mix Disclosure in 2022				
Coal	Gas	Oil	Renewable	Other[12]
5.5%	34.2%	1.9%	57.6%	0.8%
Fuel Mix Disclosure in 2021 (for comparison)				
6.8%	33.6%	2.7%	55.9%	1.0%

[12] For this report in 2022 Waste to Energy and Peat meet the criteria for inclusion in the "Other" category.

The SEM Committee decision paper SEM/11/095 outlines the calculation methodology and assumptions that have been used to calculate the fuel mix and CO2 emissions for 2022. It should be noted that all figures presented in this information paper include GOs and not only Irish metered generation.[13]

For 2022, the predominant fuels in the final fuel mix were coal, gas, and renewables. Coal has decreased from 2021 but remain high compared to 2020 levels due to more reliance on this fuel type due to the energy crisis. The % Renewable for 2022 has increased by 2% bringing it to 57.6%. It should be noted that a large proportion of these renewables were made up by using GO certificates from the EEA Member States. The EU Renewables Directive and Irish legislation allow the use of GOs for annual fuel mix for the purposes of demonstrating to final customers the share or quantity of energy from renewable sources in an electricity supplier's energy mix and in the electricity supplied to consumers. In 2022, on an All-island basis, 17,711,837 GO certificates were imported, a 2% increase from the previous year.

Figure 4: All-Island Fuel Mix 2008-2022 (inclusive of green attributes, i.e., GOs).



[13] See Section 1.2.5 above.

In accordance with SEM/11/095, the "Other" category consists of the aggregate of all fuels in a given year that individually represent less than 1% of the final overall generation. For this report in 2022 waste to energy (0.4%) and peat (0.4%) meet the criteria for inclusion in the "Other" category.

The category labelled *EU Fossil* is related to the European Residual Mix. The EU Residual Mix is calculated based on the electricity that is generated within the EU but has not been claimed by suppliers or used to meet demand within a member state. It includes the categories of *EU fossil*, *Nuclear* and *Renewable*. The EU Residual Mix is used in the Fuel Mix Disclosure for those particular years where the electricity demand on the island of Ireland has not been met by the combination of supplier claims (i.e., green attributes, i.e., GOs/REGOs, and PSO-supported generation) and indigenous generation. 2011 was the last time that the EU Residual Mix was required to meet demand in the All-Island Fuel Mix. In 2022 there was no deficit hence the EU Residual Mix was not required for the All-Island Fuel Mix in 2022.

As a result of Brexit, Renewable Energy Guarantees of Origin (REGOs) from the United Kingdom (UK) are not acceptable as renewable certificates within European Union (EU) Member States since 1 January 2021.[14]

In the previous All-Island FMD, SEMO, in conjunction with both RAs, provided an update on GOs and REGOs arrangements in the EU and UK. The latest arrangements on GOs and REGOs in the EU and UK are summarised as follows:

- **For Suppliers licensed in Northern Ireland**: The UK Government announced in July 2022 its intention to cease the recognition of EU GOs from April 2023. EU GOs were eligible for the 2022 reporting period. The Government will ensure Ofgem will continue to issue REGOs to allow electricity suppliers in NI to comply with their FMD obligations.[15]

  It should be noted that the NI Government has not made a decision to disallow the use of EU GOs in NI. However, market participants should monitor communications or agreements from either the EU, NI or UK authorities with regards to this position.

[14] Notification from the European Commission, issued on 7 March 2018.
[15] https://www.ofgem.gov.uk/environmental-and-social-schemes/renewable-energy-guarantees-origin-rego/renewable-energy-guarantees-origin-rego-electricity-suppliers-and-generators/guarantees-origin-goos.

- **For Suppliers licensed in Ireland**: From 1 January 2021, UK REGOs are not accepted for import or cancellation for FMD in Ireland.

Insofar that the CRU is made aware, should subsequent communications or agreements from either the EU or UK authorities indicate a change in this position, both RAs in conjunction with SEMO, will provide SEM market participants with an update on any changes to any future FMD processes or the policy.

3. CO2 Emissions

Emissions data for each generator in the SEM is supplied annually to SEMO by the EPA (Environmental Protection Agency) for Ireland.

The emission figures are grouped according to fuel type and divided by metered generation to give specific emission factors for each fuel. These values are then used in the calculation of the average All-Island CO2 emissions intensity and in each individual supplier's CO2 emissions intensity which consider both indigenous generation in the SEM and supplier claims (green attributes i.e., GO and REGO certificates, and PSO-supported generation).

Note that the unit of measure for emissions intensity in this information paper is g/kWh. The use of g/kWh is consistent with the reporting of emissions intensity by other authorities and the unit Kilowatt hour (kWh) is the unit used on customers' bills. To calculate the emissions (measured in grams of CO2), multiply the emissions intensity (in g/kWh) by the electricity supplied (in kWh).[16]

It should be noted that CO2 intensity in this FMD does not reflect the CO2 intensity of the Irish electricity sector in practice. As noted above, the EU Renewables Directive and Irish legislation permit electricity suppliers licenced in Ireland to use green attributes, i.e., GO certificates, for their annual fuel mix and allow balance the emissions from the electricity their customers consume.

The average All-Island CO2 emissions per kWh of electricity has decreased by 9.3% between 2021 and 2022, from 258 g/kWh in 2021 to 234 g/kWh in 2022. This decrease is predominantly driven by an increase in renewable generation and reduced coal, oil, and peat generation in 2022.

As demand in Ireland potentially rises, probably more conventional generation may be required to supplement renewables technology. The trajectory of emissions in the Irish electricity sector, reflected in this paper, and reflected in the emissions intensity when GOs are removed, reflect a challenging situation for Ireland's binding emissions ceilings. The CO2 intensity per unit of electricity generated without of GOs in Ireland is 296.0 g/kWh.[17] The CO2 intensity per unit of electricity consumed without of GOs in Ireland is 330.4 g/kWh.[18] Therefore, with electricity demand across the island of Ireland forecasted to grow rapidly, as

[16] This is also the Unit shown the table "Default Presentation of Information" in Appendix 1.
[17] https://www.seai.ie/data-and-insights/seai-statistics/conversion-factors/.
[18] https://www.seai.ie/data-and-insights/seai-statistics/conversion-factors/.

reflected in the latest EirGrid's Generation Capacity Statement, achieving these national emissions ceiling targets without an unprecedented ramp-up of renewable generation, or a reduction in total demand, could be extremely challenging for Ireland.

Figure 5: Average All-Island CO2 Emissions (inclusive of green attributes, i.e., GOs).

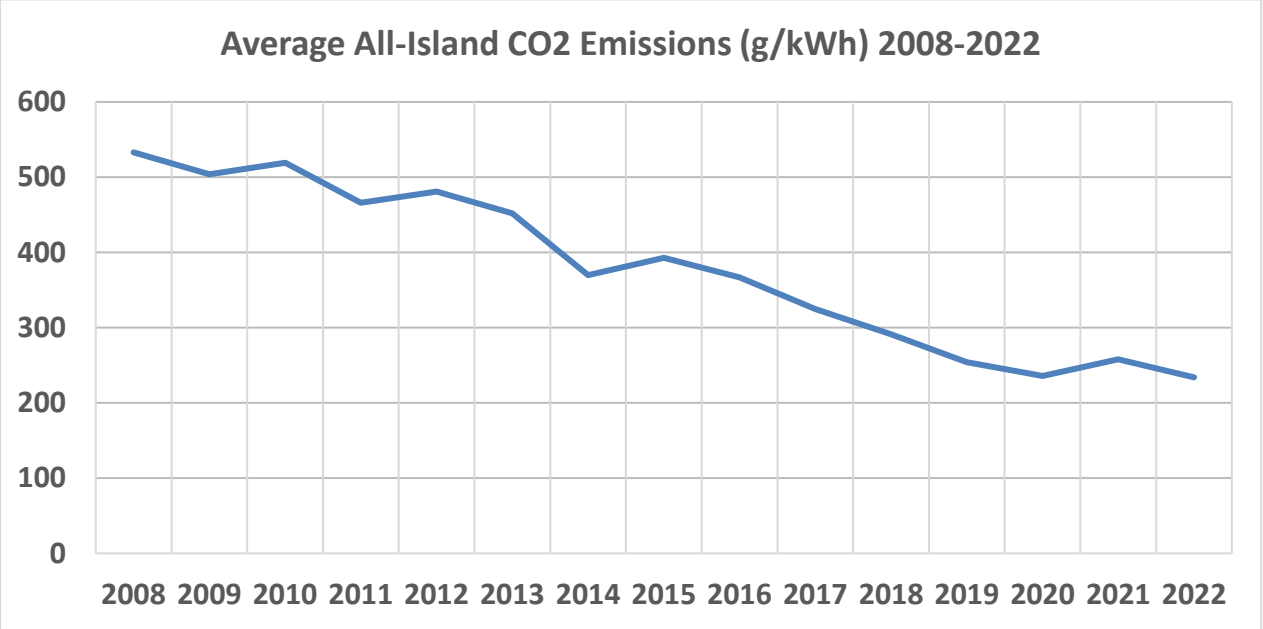
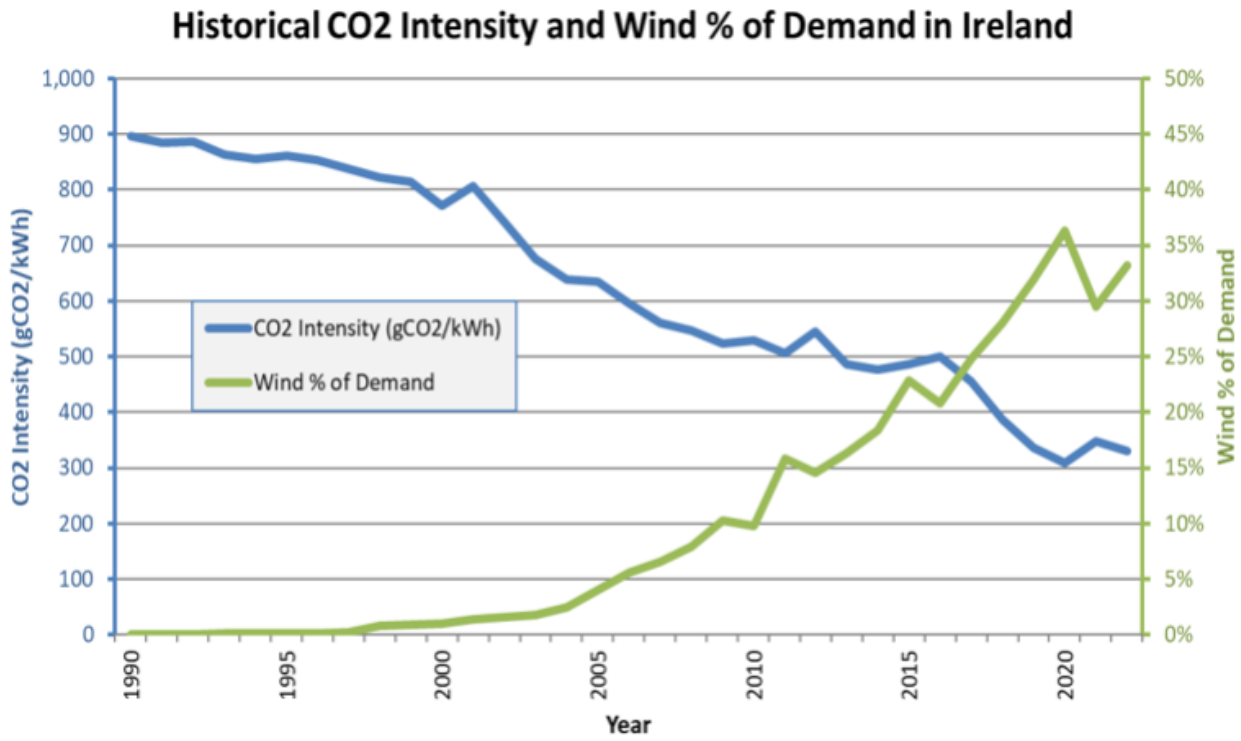


Figure 6: CO2 intensity and Wind % of demand in Ireland (exclusive of green attributes, i.e., GOs).



4. Individual Supplier's Fuel Mix

This section sets out the fuel mix and CO2 emissions for each individual electricity supply company to meet demand in Ireland. These are divided into three groups:

1. Supply companies which made a declaration[19] of the data needed for the calculation of fuel mix;
2. Supply companies which did not make a declaration by March 2023 for the 2022 fuel mix disclosure period;
3. Self-suppliers who chose to make declarations for the purposes of fuel mix disclosure.

The fuel mix calculation is carried out on an individual supplier licence basis. This paper is only displaying the Fuel Mix Disclosures for suppliers licenced in IE.[20] Those which are below the All-Island Emissions Factor are highlighted in **Green**. Suppliers with an Emissions Factor above the All-Island Emissions Factor are highlighted in **Red**. The average All-Island fuel mix, as declared by the supply companies, is also provided for reference.

The Residual Mix CO2 Emissions Factor has decreased from 0.514 in 2021 to 0.485 in 2022. This decrease in the Emissions factor is consistent with the decreased volumes of fossil fuel-types contributing to the Residual Mix over these same periods. It should be noted that suppliers who did not submit a fuel mix declaration to SEMO for this FMD have been assigned the Residual Mix and are highlighted as such in table 8.

Three self-suppliers[21] made a declaration for the purposes of fuel mix disclosure. These associated fuel mixes have been included in table 9 below.[22] Submissions received from self-suppliers have been included in this report due to the low volumes of such submissions received for the 2022 disclosure period.[23]

[19] Declarations were required to be submitted to SEMO by March 2022 for the 2021 disclosure period.
[20] The Fuel Mix Disclosure information for suppliers operating in Northern Ireland is published separately and can be found in the Utility Regulator's report "*All Island Fuel Mix and CO_2 Emissions 2021*".
[21] A self-supplier is a supply company which supplies electricity only to its own site and which does not compete to supply energy to any third party.
[22] It should be noted that the purpose of this paper is to provide information to customers on the fuel mix and CO2 emissions of their electricity supply. **Only suppliers serving electricity customers are required to disclose their assigned fuel mix.**
[23] Note that if the number of these increase in subsequent reports, then their inclusion may be reviewed as it is considered that they may not be best placed for inclusion in this report.

Figure 7: Fuel Mix Disclosures for suppliers licenced in IE (inclusive of green attributes, i.e., GOs).

Suppliers making declarations	Coal	Gas	Oil	Renewable	Other	Total	gCO_2 /kWh
All-Island Fuel Mix	**5.50%**	**34.20%**	**1.90%**	**57.60%**	**0.80%**	100%	**234**[24]
Bord Gais Energy	0.00%	69.62%	0.00%	30.38%	1.8%	100%	315
Electric Ireland[25]	0.13%	19.80%	0.05%	80.72%	0.02%	100%	88
Energia	0.00%	0.00%	0.00%	100.00%	0.00%	100%	0
Go Power [26]	0.00%	0.00%	0.00%	100.00%	0.00%	100%	0
Panda Power	0.00%	0.00%	0.00%	100.00%	0.00%	100%	0
SSE Airtricity	0.00%	0.00%	0.00%	100.00%	0.00%	100%	0
Pinergy	0.00%	0.00%	0.00%	100.00%	0.00%	100%	0
Iberdrola Ireland	0.00%	0.00%	0.00%	100.00%	0.00%	100%	0
Flogas Natural Gas	0.00%	0.00%	0.00%	100.00%	0.00%	100%	0
Arden Energy	14.21%	51.03%	4.93%	27.61%	2.22%	100%	437
Orsted Ireland Green Energy [27]	0.00%	0.00%	0.00%	100.00%	0.00%	100%	0
Captured Carbon	0.00%	0.00%	0.00%	100.00%	0.00%	100%	0
Cenergise Trading	0.00%	0.00%	0.00%	100.00%	0.00%	100%	0
Ecopower	0.00%	0.00%	0.00%	100.00%	0.00%	100%	0
Flogas Enterprise Solutions[28]	0.00%	0.00%	0.00%	100.00%	0.00%	100%	0

[24] (inclusive of green attributes, i.e., GOs).
[25] ESB Customer Supply and ESB IE Independent Energy combined.
[26] LCC IE is branded as GO Power.
[27] BRI Green Energy was bought by Orsted and now go by the name Orsted Ireland Green Energy.
[28] Naturgy has rebranded as Flogas Enterprise Solutions. This is different again from Flogas Natural Gas Limited.

Community Power	11.20%	40.23%	3.89%	42.93%	1.75%	100%	345
ElectroRoute Energy Supply	0.00%	0.00%	0.00%	100.00%	0.00%	100%	0
Edenderry Supply Company	0.00%	0.00%	0.00%	100.00%	0.00%	100%	0
PrePay Power	14.66%	52.65%	5.09%	25.31%	2.29%	100%	451

Figure 8: Suppliers assigned the Residual Mix in 2021 (inclusive of green attributes, i.e., GOs).

Suppliers not making declarations	Coal	Gas	Oil	Renewable	Other	Total	gCO_2 /kWh
Glowpower	14.87%	53.38%	5.16%	24.27%	2.32%	100%	457[29]
Waterpower Engineering	14.87%	53.38%	5.16%	24.27%	2.32%	100%	457[30]

Figure 9: Self-Suppliers' Fuel Mix by Fuel Type in 2021[31] (inclusive of green attributes, i.e., GOs).

Self-Supplier	Coal	Gas	Peat	Renewable	Other	Total	gCO_2 /kWh
Axpo UK	0.0%	0.0%	0.0%	100.0%	0.0%	100%	0
Dublin Waste to Energy Supply	0.0%	0.0%	0.0%	100.0%	0.0%	100%	0
Statkraft Markets GmbH	0.0%	0.0%	0.0%	100.0%	0.0%	100%	0

[29] GlowPower Limited had no claims and were assigned the residual mix emissions factor with the renewable PSO adjustment figure assigned to them factored in.
[30] WaterPower Engineering Limited had no claims and were assigned the residual mix emissions factor with the renewable PSO adjustment figure assigned to them factored in.
[31] Killoween Gas originally submitted a request for inclusion in FMD as a self-supplier, but after the submission requested to be removed as they had no demand on supply unit.

5. Disclosure of Fuel Mix

A supplier's fuel mix information must be presented on bills in accordance with SEM/11/095 (see Appendix 1 for details). This must observe the following points:

- Where fuel mix information is presented on the back of a consumer bill, reference must be made to it on the front of the bill;
- Radioactive waste information is required by Directive 2009/72/EC and S.I. No. 60 of 2005. This figure is 0.000 g/kWh for all suppliers in 2022 and therefore need not be included with the 2022 fuel mix disclosure information on bills (See Appendix 1);
- To ensure consistency across suppliers, percentages should be rounded to one decimal place;
- CO2 information should be given in the units of grams of CO2 per kWh (g/kWh);
- In addition to the fuel mix disclosure requirements, section 3.5.3 of the CRU's decision paper on the Regulation of Green Source Products in the Electricity Retail Market, CER/15/205, governs the display of fuel mix information for suppliers who offer green source products.

  In relation to advertising and promotion of products, suppliers should also follow the *Code of Practice on Marketing and Advertising* from the Supplier Handbook and General Clarifications as may be published from time to time by the CRU, including the following:

  - CRU20083 – General Clarification on the Advertisement of Green Products;
  - CRU19071 - General Clarification on the Code of Practice on Marketing and Advertising; and
  - SEMO's internal business process for Interim GSPV[32].

The 2022 fuel mix information must be presented on all customer bills within two months of the publication of this paper.

[32] For information refer to Interim Process on SEMO's GSPV webpage: https://www.sem-o.com/markets/green-source-product-veri/

Appendix 1: Presentation of Information on Bills

Default Presentation of Information[33]:

The fuel mix information should be presented on electricity bills in accordance with SEM/11/095. For this purpose, a template from this decision paper is reproduced below.[34]

SUPPLIER Z Fuel Mix Disclosure **Applicable Period: January 2022 to December 2022**		
Electricity supplied has been sourced from the following fuels:	**% of total**	
	Electricity Supplied by SUPPLIER Z	**Average for All-Island Market (for comparison)**
Renewable	X %	X %
Natural Gas	X %	X %
Peat	X %	X %
Coal	X %	X %
Oil	X %	X %
Nuclear	X %	X %
EU Fossil	X %	X %
Other	X %	X %
Total	100 %	100 %
Environmental Impact		
CO_2 Emissions	X g/kWh	X g/kWh
Your specific fuel mix may differ to the fuel mix shown because SUPPLIER Z offers green source products. For information on your fuel mix and on the environmental impact of your electricity supply visit www.SUPPLIERZ.ie or, for further details call 00XXX X XXX XXXXX [35]		

[33] For the purpose of illustration, the supply company is given the name "SUPPLIER Z"
[34] Please refer to Section 1.7 of SEM/11/095 for further details.
[35] Suppliers who offer green source products in Ireland should refer to Section 3.5.3 of the CRU's Decision paper, CER/15/205, on the "*Regulation of Green Source Products in the Electricity Retail Market*".

Appendix 2: All-Island Fuel Mix 2005 - 2022

Fuel Mix 2005-2022 (Percentage share of total)

	2005	***2006***	***2007***	***2008***	***2009***	***2010***	***2011***	***2012***	***2013***	***2014***	***2015***	***2016***	***2017***	***2018***	***2019***	***2020***	***2021***	***2022***
Coal %	24.00	19.00	18.00	17.00	14.24	15.98	14.44	19.89	18.42	15.71	16.02	13.76	9.83	6.77	2.63	2.98	6.80	5.50
EU Fossil %	0.00	0.00	0.00	0.00	0.00	0.00	3.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gas %	46.00	50.00	55.00	61.00	61.85	64.06	56.16	47.74	44.09	41.6	36.36	39.66	39.96	38.51	37.86	35.75	33.60	34.20
Oil %	12.00	9.00	6.00	4.00	2.53	1.59	0.00	0.00	0.00	1.06	0.00	0.00	0.00	0.00	0.00	0.00	2.70	1.90
Renewables %	9.00	11.00	11.00	11.00	14.23	12.11	17.21	23.74	30.24	34.46	41.06	40.09	44.47	48.95	54.04	57.86	55.90	57.60
Peat %	8.00	7.00	6.00	7.00	6.70	5.78	5.88	6.86	6.49	6.95	5.90	5.35	4.86	4.63	4.25	2.07	0.50	0.40
Other %	1.00	4.00	4.00	1.00	0.45	0.48	3.18	1.77	0.75	0.17	0.17	0.15	0.28	0.55	0.56	0.94	0.50	0.40

Note:

- Figures from 2005 to 2007 relate to Ireland-only and calculations are based on a pre-SEM methodology.
- Figures for 2008, 2009 and 2010 relate to Ireland and Northern Ireland and are based on the Interim Arrangements Methodology (SEM/09/081).
- Figures for 2011 onwards relate to Ireland and Northern Ireland and are based on the SEM Committee Decision Paper Fuel Mix Disclosure in the Single Electricity Market: Calculation Methodology Decision Paper (SEM/11/095), referenced in the Related Documents section of this paper.
- The threshold for a fuel-types inclusion in the “Other” category is <1% of Final All-Island Mix. The “Other” category consists of Non-Biodegradable Fraction of Waste (NBDFW) and EU Fossil (only for 2011).

Appendix 3: GOs Imported/Exported

It should be noted that each GO unit corresponds to one MWh of electricity generated from a renewable source.

GO imports to Ireland by country of origin (2017-2022)

Country	2017	2018	2019	2020	2021	2022
UK	7,209,276	6,499,980	4,590,300	3,059,134	-	-
Norway	300,681	2,702,943	1,802,970	12,703,498	10,521,464	10,304,805
Italy	109,778	15,000	1,637,040	-	-	-
Spain	200,000	-	907,181	-	-	-
Belgium	-	-	-	203,912	322,822	293,500
Greece	-	-	-	200,000	-	-
Sweden	-	-	-	-	797,112	2,238,029
Finland	-	-	-	-	552,042	210,372
France	-	-	-	-	1,724,700	2,061,291
Austria	-	-	-	-	429,309	300,000
Portugal	-	-	-	-	664,549	15,100
Netherlands	-	-	-	-	-	26,970
Denmark	-	-	-	-	-	699,733
Germany	-	-	-	-	-	115,000
Other[36]	454,688	307,001	1,533,201	226,651	266,492	2
TOTAL IMPORTS	**8,274,423**	**9,524,924**	**10,470,692**	**16,393,195**	**15,278,490**	**16,264,803**

[36] Sum of imported GOs where import from a country is less than 200,000.

GO exports from Ireland by country of destination (2017-2022)

Country	2017	2018	2019	2020	2021	2022
Norway	493,606	612,401	349,018	1,303,951	457,076	752,537
Belgium	-	9,140	-	3,912	18,761	216,497
Netherlands	-	13,115	-	47,123	88,626	7,000
UK	-	-	-	244,779	1,596	-
Austria	-	-	-	-	9	-
Finland	-	-	-	-	5,000	-
Denmark	-	-	-	-	-	5
France	-	-	-	-	-	20,923
Iceland	-	-	-	-	-	4,418
Latvia	-	-	-	-	-	1
TOTAL EXPORTS	**493,606**	**634,656**	**349,018**	**1,599,765**	**571,068**	**1,001,381**