



# **SEM Committee Paper**

## **All-Island Fuel Mix Disclosure and CO<sub>2</sub> Emissions 2020**

### **Information Paper**

**SEM-21-078**

**4 October 2021**

## Table of Contents

1. Introduction .....	3
2. Average All-Island Fuel Mix .....	6
3. Average All-Island CO <sub>2</sub> Emissions .....	9
4. Suppliers' Fuel Mix and CO <sub>2</sub> Emissions 2020.....	10
Appendix 1: Presentation of Information on Bills.....	13
Appendix 2: FMD Update on account of BREXIT .....	14
Appendix 3 All-Island fuel mix 2005-2020.....	15

The SEM Committee is established in Ireland and Northern Ireland by virtue of section 8A of the Electricity Regulation Act 1999 and Article 6 (1) of the Electricity (Single Wholesale Market) (Northern Ireland) Order 2007 respectively. The SEM Committee is a Committee of both CRU and NIAUR (together the Regulatory Authorities) and an independent member, that, on behalf of the Regulatory Authorities, takes any decision as to the exercise of a relevant function of CRU or NIAUR in relation to a SEM matter.

## 1. INTRODUCTION

The purpose of this Fuel Mix Disclosure (FMD) information paper from the Regulatory Authorities is to set out the 2020 fuel mix and CO<sub>2</sub> emissions figures for electricity suppliers operating in the all-island wholesale Single Electricity Market (SEM). This is shown on average across the island in Sections 2 and 3 of this paper, along with year-on-year trends, and per supplier in Section 4. The fuel mix and CO<sub>2</sub> emissions disclosures are taken from data provided to the Regulatory Authorities by the Single Electricity Market Operator ([SEMO](#)). The disclosures must be published on bills from suppliers to electricity customers in Ireland and Northern Ireland no later than two months from the publication of this paper.

The fuel mix and CO<sub>2</sub> emissions disclosures for 2020 allow consumers to understand the recent environmental impact of the electricity that they buy, compared to the all-island average, and to choose between suppliers on this basis - see Appendix 1. It should be noted that the fuel mix of each supplier (outlined in this paper) does not necessarily represent metered generation in Ireland or Northern Ireland, as suppliers may claim the attributes of renewable electricity generated outside of the SEM through electronic certificates known as Guarantees of Origin (GOs), imported from other EEA Member States<sup>1</sup>, which do not need to follow the physical flow of electricity. This is elaborated further below.

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](#)<sup>2</sup>. It is the role of SEMO to administer and calculate the fuel mix figures from the information provided by suppliers. The supplier fuel mix and associated environmental impact information (emissions) is calculated by SEMO in accordance with the SEM Committee's methodology. This methodology can be found in the SEM Committee Decision Paper *Fuel Mix Disclosure in the Single Electricity Market: Calculation Methodology Decision Paper (SEM-11-095)*.

At a high level, and in accordance with [SEM-11-095](#), the fuel mix figure for a supplier consists of non-renewable generation attributes, GOs and renewable generation attributes assigned to a supplier that are not included in the GO scheme and the Residual Mix<sup>3</sup> or EU Residual Mix. GOs are electronic certificates issued for energy generated from renewable sources in EEA Member States and are issued to renewable generators that are not in support schemes. These are tradeable instruments at European level and do not need to follow the physical flow of energy. The

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<sup>1</sup> The European Economic Area (EEA) is made up of the member states in the EU and additionally Norway, Lichtenstein and Iceland.

<sup>2</sup> The requirements in Article 3(9) of [Directive 2009/72/EC](#), which is now repealed, is recast as Directive (EU) 2019/944

<sup>3</sup> The Residual Mix is the mix of all unclaimed electricity in the system. It is calculated as the sum of: any generation attributes (including exported certificates) not assigned to, and submitted by, a supplier; surplus GOs declared by suppliers; and Unused certificates which were expired in the relevant Disclosure Period.

Association of Issuing Bodies ([AIB](#)) operates a hub where such certificates can be traded between countries. This allows suppliers to purchase the renewable benefit of certain generators across Europe and include it in their total fuel mix. GOs are both exported from SEM and imported into SEM, to and from the rest of Europe. Currently far more are imported into SEM than are exported.

Renewable generators that are signed up to the AIB's GO scheme are issued GOs per MWh of generation which can then be transferred to suppliers to use in their fuel mix disclosure. Each year, suppliers submit a completed fuel mix declaration form to SEMO which then performs the fuel mix disclosure calculations on behalf of the Regulatory Authorities.

Attention is drawn to the following when considering the fuel mixes and emission intensities set out in this document:

- Firstly, **the all-island and jurisdictional fuel mixes - resulting from the application of trading in GOs - have the potential to vary significantly from the actual renewable generation produced within each jurisdiction.** This depends on the quantity of GOs imported or exported<sup>4</sup> to or from Ireland and Northern Ireland in respect of the 12 month period for which the calculated fuel mix applies. The sole function of the GO is to prove that a given share of quantity of energy was produced from a renewable source in the EEA. A single GO is issued per MWh of electricity generated and this one GO can only be used once for the purposes of the fuel mix disclosure. Hence there is no double-counting of the same unit of European renewable electricity generation in the fuel mix disclosure.
- Secondly, in the event that there is a deficit of generation attributes to meet overall All-Island demand, the European Residual Mix will be used to meet the deficit. This also – but to a lesser extent - has the ability to lead to a fuel mix that differs from actual metered generation.

**For these reasons, the fuel mix disclosure figures for a given disclosure period may not necessarily be representative of the actual all-island Production Fuel Mix for a given calendar year.**

The fuel mix information should be presented (“disclosed”) on electricity bills in accordance with SEM-11-095. A template for this purpose is reproduced in Appendix 1 of this paper. In particular the Regulatory Authorities would like to remind suppliers of the following:

- Where fuel mix information is on the back of a bill, reference must be made to it on the front of the bill;

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<sup>4</sup> A total of 13.5 million imported GO certificates were declared by suppliers for disclosure in the 2020 fuel mix. One GO represents 1MWh of electricity produced from a renewable source. The equivalent 13.5 TWhs imported accounted for 38.3% of the overall renewable figure of 34.1 TWh.

- While radioactive waste information is required by of [Directive \(EU\) 2019/944](#), this figure is zero for all suppliers in 2020 and therefore need not be included with the 2020 fuel mix disclosure information on bills;
- To ensure consistency across suppliers, percentages should be rounded to one decimal place;
- CO<sub>2</sub> emissions information should be given in the unit *grams of CO<sub>2</sub> per kWh* (gCO<sub>2</sub>/kWh);
- Where separate products associated with a particular fuel mix are offered to certain customers, all the supplier's customers should receive information, on request, regarding the fuel mix associated with their electricity (not simply the supplier's average fuel mix) in accordance with [SEM-11-095](#); and
- The 2020 fuel mix information must be on all bills within two months of the publication of this paper.

Note that the widely used unit of measure<sup>5</sup> *gCO<sub>2</sub>/kWh* is the preferred unit of measure for reporting on emissions intensity associated with electricity generation. For consistency, the unit *gCO<sub>2</sub>/kWh* should be used in billing, advertising and promotional material of suppliers, including on website presentations, customer bills, infographics, annual reports, etc.

On account of Brexit, SEMO – in conjunction with the RAs - provided an update in November 2020 on Fuel Mix Disclosure 2020. This is summarised as follows:

For Suppliers licensed in Northern Ireland: Until such time as the UK reviews the continuation of eligibility of EU GOs, they are accepted for import or cancellation in Northern Ireland.

Ofgem has stated that *'[UK] Government has indicated its intention to review this in 2021 so that, longer term, domestic recognition of Guarantees of Origin issued in EU countries will take place only on a reciprocal basis'*.

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

Further details are included in Appendix 2. Please note that these positions are based on the information available in Q4 2020 and are valid as of the date of publication of this information paper.

Should subsequent communications or agreements from either the EU or UK authorities indicate a change in this position, the RAs – in conjunction with SEMO - will provide market participants with an updated understanding of the impact on FMD.

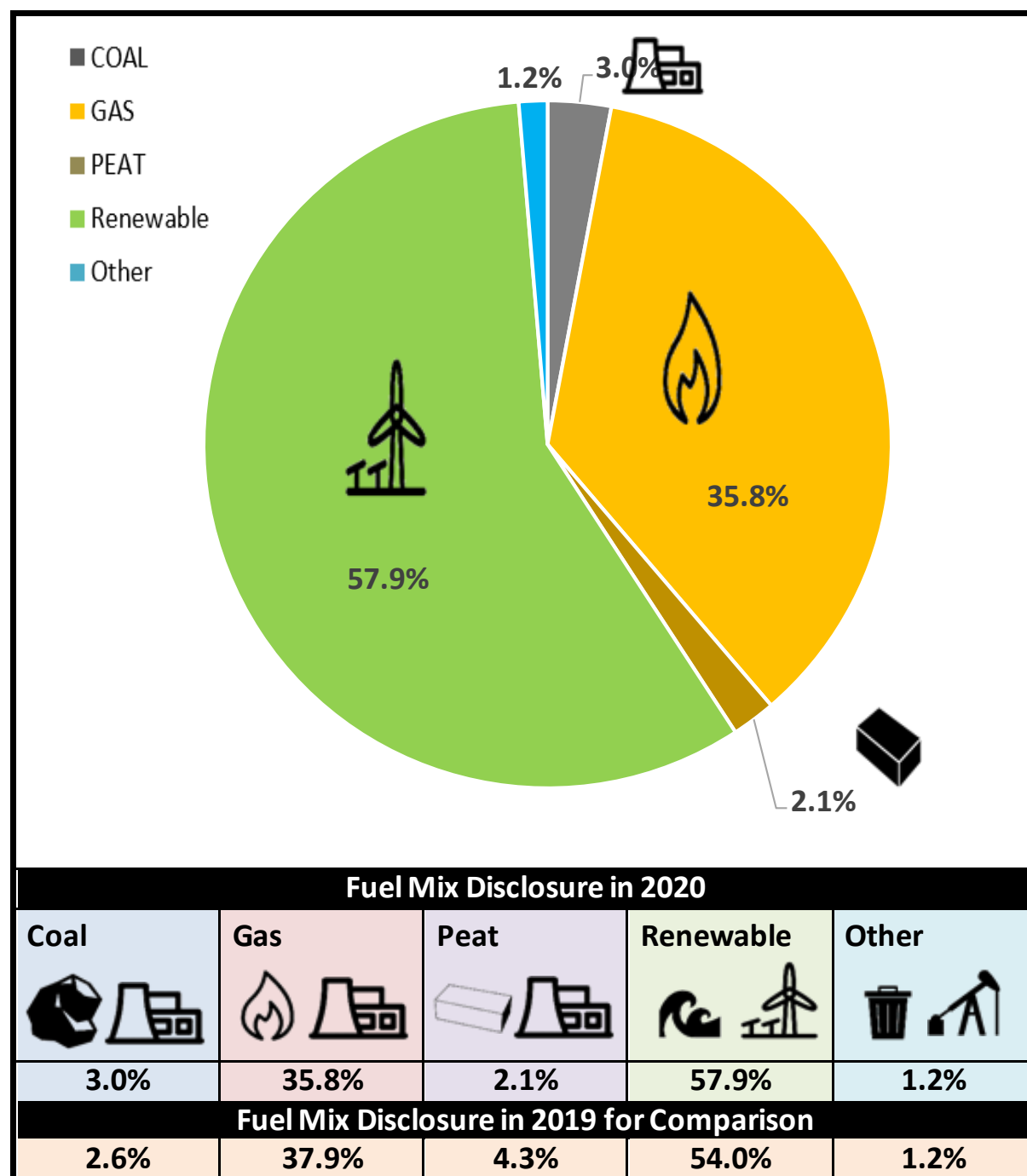
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<sup>5</sup> The unit of measure *tCO<sub>2</sub>/MWh* was used in the 2018 report and for some years before that. Use of the unit *gCO<sub>2</sub>/kWh* was re-introduced for the 2019 report for disclosures and continues.

## 2. AVERAGE ALL-ISLAND FUEL MIX

This section sets out the 2020 and year-on-year fuel mix for the all-island SEM, i.e. on average across the island.

Figure 1: All-Island Fuel Mix 2020



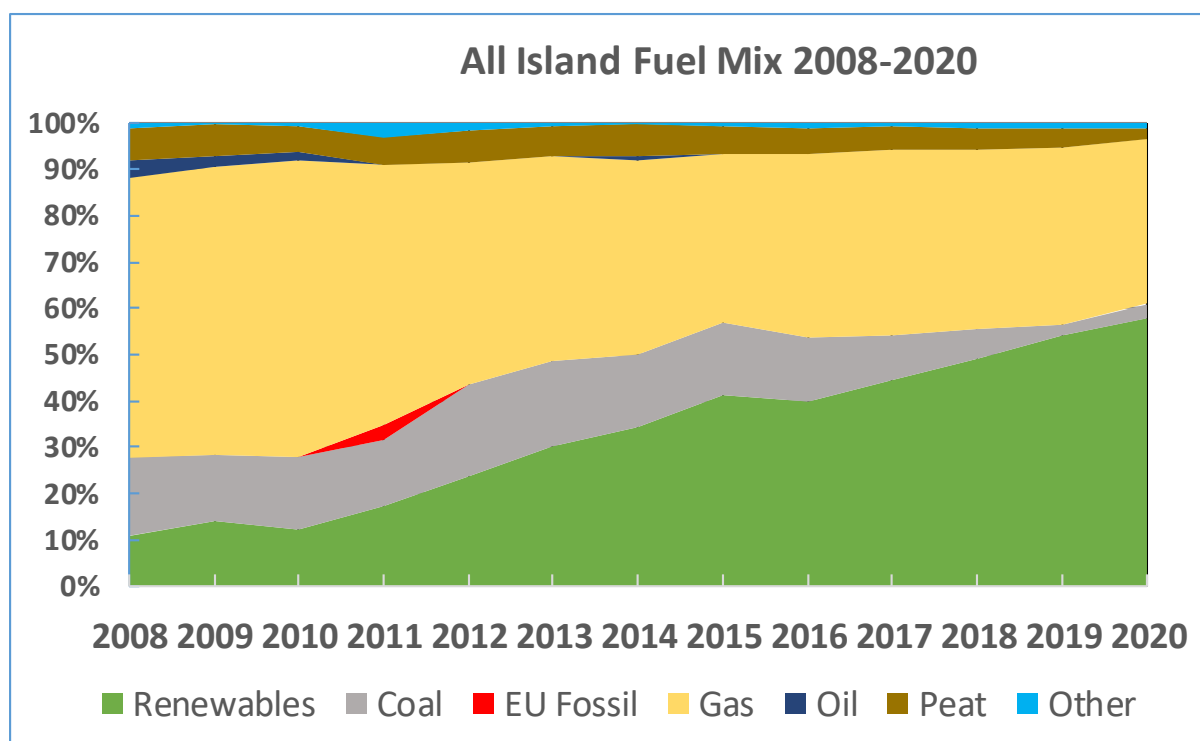
The SEM Committee decision paper [SEM-11-095](#) outlines the calculation methodology and assumptions that have been used to calculate the fuel mix and CO<sub>2</sub> emissions for 2020: note again that all figures here include GOs and not only metered generation (see section 1).

Figure 1 above shows the average all-island 2020 fuel mix and – for comparison - the corresponding fuel mix for 2019.

A longer-term trend is shown in Figure 2<sup>6</sup>, indicating that the overall use of fossil fuels as a fuel source for electricity suppliers in SEM has decreased on average from 89.0% in 2008 to 42.1% in 2020. Correspondingly, the overall share of renewable fuel sources has increased fivefold from 11.0% in 2008 to 57.9% in 2020. From 2019 to 2020, the share of renewables in the average All-Island Fuel Mix increased from 54.0% to 57.9%. The share of electricity from coal increased from 2.6% in 2019 to 3.0% in 2020.

The increase in the renewable share to 57.9% in 2020 is on account of the decrease in the share of electricity sourced from peat and the increase in indigenous production of renewable electricity. For the year 2019, the importation of GO certificates amounted to 10.5 million. This increased by 29% to 13.5 million for 2020. This increase was driven by a large increase in the importation of GOs sourced from hydropower.

**Figure 2: All Island Fuel Mix Disclosure Trend**



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. Oil (0.4%) contributes to the “Other” figure, with Non-Biodegradable Waste (0.8%).

<sup>6</sup> The data corresponding to the graph in Figure 2 is tabulated in Appendix 3.

The category labelled EU Fossil is the residual portion of demand drawn from the aggregation of all EU fossil fuel sources in the EU Residual Mix. It has not featured in the All-Island Fuel Mix since 2011. The reason for this is that 100% of the energy demand on the island of Ireland was accounted for in each of those years since 2011 via the aggregate of the generation attributes and GOs/REGOs and PSO-supported generation, as declared by suppliers. Under these circumstances, the European Residual Mix is not required to fill a deficit on the island of Ireland and therefore has no bearing on the All-Island Fuel Mix Disclosure. This applied also in 2020, which means that Nuclear and EU Fossil fuel contributions for the All-Island Fuel Mix in 2020 were zero.

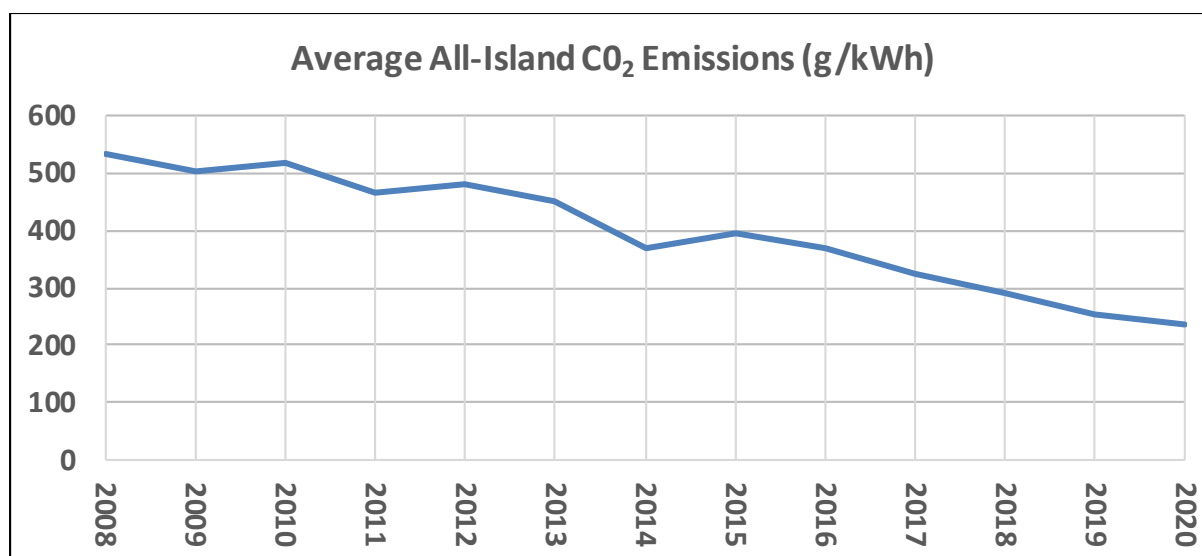


### 3. AVERAGE ALL-ISLAND CO<sub>2</sub> EMISSIONS

Emissions data for each generator in the SEM is supplied annually to SEMO by the EPA (Environmental Protection Agency) for Ireland and the DAERA (Department of Agriculture, Environment and Rural Affairs) for Northern 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 and imported GOs are then used to calculate the average all-island CO<sub>2</sub> Emissions Factor and each individual supplier's CO<sub>2</sub> Emissions Factor.

The average all-island CO<sub>2</sub> emissions per kWh of electricity decreased by 7% between 2019 and 2020, from 254 g/kWh in 2019 to 236 g/kWh in 2020. This is in line with a longer-term downward trend in average CO<sub>2</sub> emissions, having fallen by 56% from 533 g/kWh in 2008, as shown in the graph below. This is driven by the increase in the share of renewable fuel sources and the net importation of GOs.



## 4. SUPPLIERS' FUEL MIX AND CO<sub>2</sub> EMISSIONS 2020

Following the presentation in Sections 2 and 3 of average fuel mix and CO<sub>2</sub> emissions across the island, this section sets out the fuel mix and CO<sub>2</sub> emissions for each electricity supplier.

The fuel mix calculation is carried out on an individual licence basis. Up to and including the 2020 year, where a supplier operates as a single company but holds separate licences (such as a supplier that operates in both jurisdictions) those licences that have excess generation attributes are distributed among the licences with excess demand: the generation attributes can be distributed to the excess demand within the single company prior to using the Residual Mix, if the company holds multiple licences.

Table 1 below show the individual fuel mixes and carbon dioxide emissions in grams per kWh of electricity for each supplier. The average all-island fuel mix, as declared by the supply companies, (as per section 2) is also provided for reference.

Those suppliers who did not submit a fuel mix declaration to SEMO have been assigned the Residual Mix and are highlighted as such in Table 2.

One self-supplier<sup>7</sup> made a declaration for the purposes of fuel mix disclosure. The associated fuel mix has been included in Table 3 below. However, it should be noted that the purpose of this paper is to provide information to customers on the fuel mix of their electricity supply. Therefore, only suppliers serving electricity customers are required to disclose their assigned fuel mix. Submissions received from self-suppliers have been accepted and are included in this report due to the low volumes of such submissions received. However, if the number of these increases in subsequent reports, then their inclusion - or the method of presentation - may be reviewed as they may detract from the aim of the report.

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<sup>7</sup> 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.

**Table 1: Declared Suppliers' Fuel Mix by Fuel Type in 2020**

Supplier	Jurisdiction	Coal	Gas	Peat	Renew-able	Oil	Other	Emissions (gCO <sub>2</sub> /kWh)
<b>All-Island</b>		<b>3.0%</b>	<b>35.8%</b>	<b>2.1%</b>	<b>57.9%</b>	<b>0.4%</b>	<b>0.8%</b>	<b>236</b>
Bord Gais Energy	ROI	0.4%	63.8%	0.5%	34.6%	0.5%	0.2%	328
Budget Energy	NI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0
Electric Ireland	All-Island	0.5%	34.3%	0.6%	63.7%	0.6%	0.3%	179
	ROI	0.6%	27.1%	0.7%	70.6%	0.7%	0.3%	142
	NI	0.0%	78.1%	0.0%	21.9%	0.0%	0.0%	404
Energia	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0
	NI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0
Just Energy	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0
Go Power	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0
	NI	4.1%	44.4%	5.2%	39.0%	5.0%	2.3%	414
Panda Power	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0
Power NI	NI	0.0%	45.7%	0.0%	54.3%	0.0%	0.0%	237
Click Energy	NI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0
SSE Airtricity	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0
	NI	0.0%	44.5%	0.0%	55.5%	0.0%	0.0%	230
Naturgy	All-Island	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0
	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0
	NI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0
Iberdrola	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0
Pinergy	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0
3T Power	NI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0
Flogas	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.00%	0
GlowPower	ROI	4.2%	45.3%	5.3%	37.7%	5.1%	2.4%	406
ElectroRoute	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.00%	0
Arden Energy	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.00%	0
Evermore Energy	NI	0.0%	0.0%	0.0%	100.0%	0.0%	0.00%	0
Ever Energy (Bright)	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0
BRI Green Energy Supply	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0

**Table 2: Suppliers assigned the Residual Mix in 2020**

Suppliers assigned the All Island Residual Mix	Jurisdiction	Coal	Gas	Peat	Renewable	Oil	Other	Emissions (gCO <sub>2</sub> /kWh)
<b>BE Energy<sup>8</sup></b>	ROI	6.8%	47.7%	4.6%	31.7%	5.3%	3.9%	407
<b>PrePay Power</b>	ROI	6.8%	47.7%	4.6%	31.7%	5.3%	3.9%	407

**Table 3: Self-Suppliers' Fuel Mix by Fuel Type in 2020**

Self-Supplier	Jurisdiction	Coal	Gas	Peat	Renewable	Oil	Other	Emissions (gCO <sub>2</sub> /kWh)
<b>Killowen Biogas</b>	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0

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<sup>8</sup> Flogas acquired Budget Energy, including BE Energy, in May 2021. The transfer of BE Energy customers' accounts to Flogas commenced 4 December 2020.

## APPENDIX 1: PRESENTATION OF INFORMATION ON BILLS

### Default Presentation of Information<sup>9</sup>

The fuel mix information should be presented on electricity bills in accordance with SEM-11-095. For this purpose, a template from SEM-11-095 is reproduced below. Refer also to Section 1.7 of this paper for further details.

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*".

<b>SUPPLIER Z Disclosure Label</b>		
<b>Applicable Period: January 2020 to December 2020</b>		
<b>Electricity supplied has been sourced from the following fuels:</b>	<b>% of total</b>	
	<b>Electricity supplied by SUPPLIER Z</b>	<b>Average for All Island Market (for comparison)</b>
Coal	X %	X %
Natural Gas	X %	X %
Nuclear	X %	X %
Renewable	X %	X %
Peat	X %	X %
Oil	X %	X %
EU Fossil	X %	X %
Other	X %	X %
<b>Total</b>	100 %	100 %
<b>Environmental Impact</b>		
CO <sub>2</sub> Emissions	X g/kWh	X g/kWh
Your specific fuel mix may differ from 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 <a href="#">www.SUPPLIER Z.ie</a> or, for further details call 00XXX X XXX XXXXX		

<sup>9</sup> Refer to SEM-11-095 for further detail on presentation requirements. Note that the fuel categories used each year can vary. Note also that the order of presentation may be rearranged by suppliers so that the fuel sources are presented in descending order: i.e. from largest share to smallest share.

## APPENDIX 2: FMD UPDATE ON ACCOUNT OF BREXIT

**The following is SEMO's update to suppliers on Fuel Mix Disclosure 2020 and Brexit, as issued 27 November 2020:**

To: Suppliers participating in Fuel Mix Disclosure 2020,

Supplier Fuel Mix Disclosure (FMD) submissions for calendar year 2020 are due to be completed by 31st March 2021. Given that the end of the transition period for the UK's exit from the European Union is planned for the 31st December 2020, SEMO wish to provide suppliers with an update on our understanding of how the end of the transition period impacts on FMD 2020 and the acceptability of UK REGOs and EU GOs in the FMD 2020.

Based on SEMO's understanding of the current legal position, and following engagement with the Commission for Regulation of Utilities, SEMO can confirm the following, as it relates to Suppliers licensed in Ireland:

- Import and cancellation of EU GOs for use in FMD 2020 before or after the end of the transition period is acceptable.
- UK (GB and NI) REGOs imported and cancelled for use in FMD 2020 prior to the end of the transition period, 31st December 2020, is acceptable. From the 1st January 2021 UK REGOs will not be accepted for import or cancellation for FMD for Suppliers licensed in Ireland.

Based on SEMO's understanding of the current legal position, and following engagement with the Utility Regulator Northern Ireland, SEMO can confirm the following, as it relates to Suppliers licensed in Northern Ireland:

- GB and NI REGOs cancelled for use in the FMD 2020 before or after the end of the transition period is acceptable.
- Import and cancellation of European GOs for use in FMD 2020 before or after the end of the transition period is acceptable. Note that the UK have allowed for a review during 2021 of the continuation of eligibility of EU GOs.

Please note these positions are based on the information available to SEMO as at the 26th November 2020. Should subsequent communications or agreements from either the EU or UK authorities indicate a change in this position we will provide you with an updated understanding of the impact on FMD as soon as possible.

## APPENDIX 3 ALL-ISLAND FUEL MIX 2005-2020

### Fuel Mix 2005-2020 (Percentage share of total)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Coal %</b>	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
<b>EU Fossil %</b>	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
<b>Gas %</b>	46.00	50.00	55.00	61.00	61.85	64.06	56.16	47.74	44.09	41.6	36.36	39.66	39.9	38.51	37.86	35.75
<b>Oil %</b>	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
<b>Renewables %</b>	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
<b>Peat %</b>	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
<b>Other %</b>	1.00	4.00	4.00	1.00	0.45	0.48	3.18	1.77	0.75	0.17	0.65	1.14	0.88	1.15	1.22	1.34

### 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 “Other” category consists of:
  - Oil, but only for those years in which it is below the 1% threshold; and
  - Non-Biodegradable Fraction of Waste (NBDFW) and EU Fossil (only for 2011).