



# **SEM Committee Paper**

## **All-Island Fuel Mix Disclosure and CO<sub>2</sub> Emissions 2019**

### **Information Paper**

**SEM-20-068**

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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

**1.1** The purpose of this Information paper from the Regulatory Authorities is to set out the 2019 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.

**1.2** The fuel mix and CO<sub>2</sub> emissions disclosures for 2019 allow consumers to understand the recent environmental impact of the electricity that they buy, compared to the all-island average, and 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.

**1.3** 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 3(9) of [Directive 2009/72/EC](#). 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](#)).

**1.4** 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>2</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 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/from the rest of Europe. Currently far more are imported into SEM than are exported.

**1.5** 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 fuel mix declaration form to SEMO which performs the fuel mix calculation on behalf of the Regulatory Authorities.

**1.6** 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 - has 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>3</sup> to or from Ireland / 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.

Therefore, 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.

**1.7** The fuel mix information should be presented on electricity bills in accordance with SEM-11-095. A template for this purpose is reproduced in the Appendix 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>3</sup> A total of 10,470,692 imported GO certificates were declared by suppliers for disclosure in the 2019 fuel mix. One GO represents 1MWh of electricity produced from a renewable source. The equivalent 10,470,692 MWhs imported accounted for 38.7% of the overall renewable figure of 27,047,281 MWh.

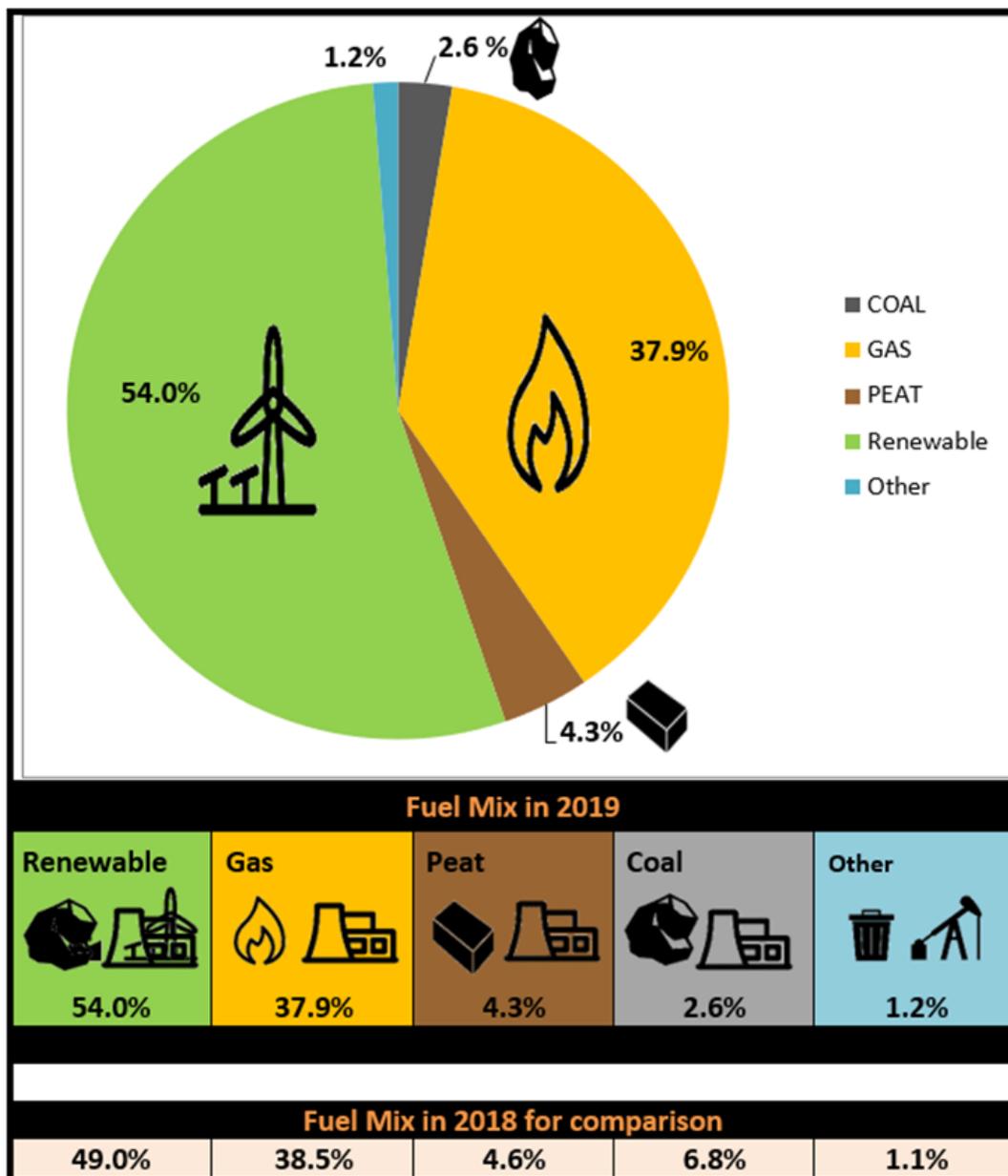
- While radioactive waste information is required by Directive 2009/72/EC, this figure is zero for all suppliers in 2019 and therefore need not be included with the 2019 fuel mix disclosure information on bills;
- To ensure consistency across suppliers, percentages should be rounded to one decimal place;
- 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 2019 fuel mix information must be on all bills within two months of the publication of this paper.

**1.8** Note that the widely used unit of measure of gCO<sub>2</sub>/kWh (instead of the unit tCO<sub>2</sub>/MWh, as has been used in recent years) is adopted in this publication as the preferred unit of measure for reporting on emissions intensity associated with electricity generation. It is anticipated that this change should disseminate further into the advertising and promotional material of suppliers, including on website presentations, customer bills, infographics, annual reports, etc.

## 2. AVERAGE ALL-ISLAND FUEL MIX

2.1 This section sets out the 2019 and year-on-year fuel mix for the all-island SEM, i.e. on average across the island. 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 2019 - again we note that all figures here include GOs and not only metered generation (see section 1). Figure 1 below<sup>4</sup> shows the average all-island 2019 fuel mix and – for comparison - the corresponding fuel mix for 2018.

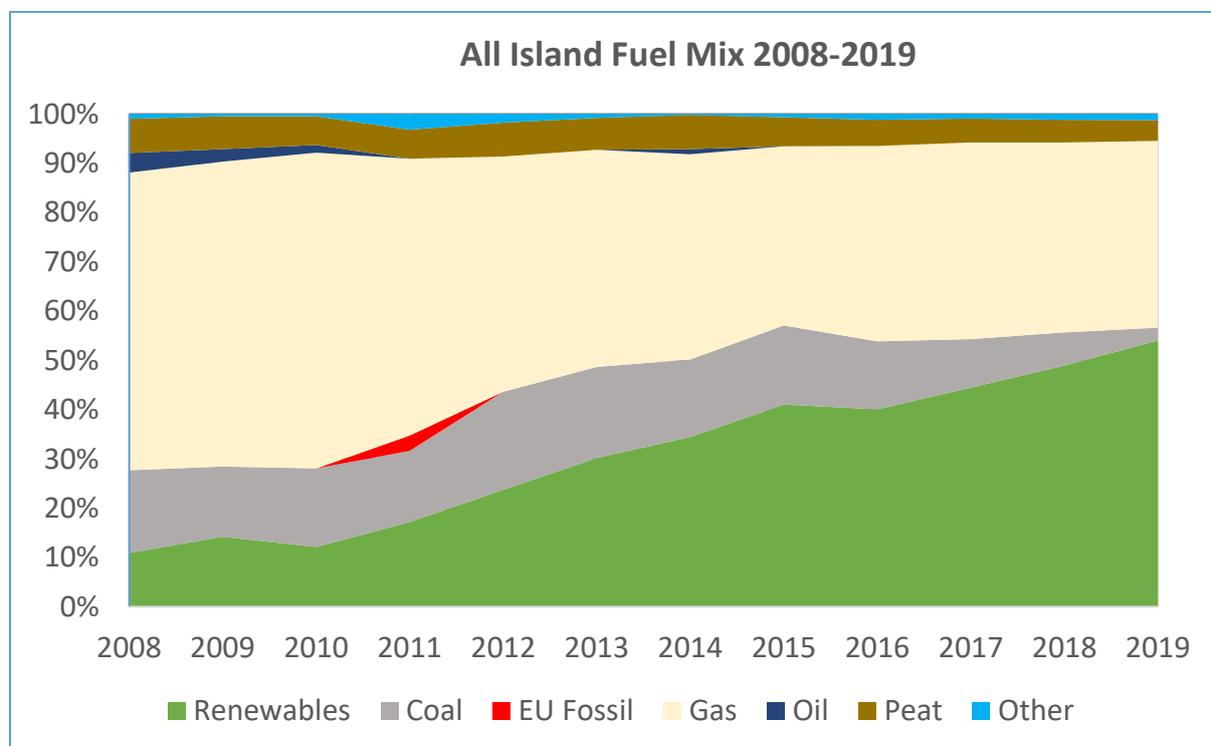
Figure 1: All-Island Fuel Mix 2019



<sup>4</sup> The data corresponding to the graph in Figure 1 is tabulated in Appendix 2.

**2.2** A longer-term trend is shown in the following graph, 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 46.0% in 2019. Correspondingly, the overall share of renewable fuel sources has increased fivefold from 11.0% in 2008 to 54.0% in 2019. From 2018 to 2019, the share of renewables in the average All-Island Fuel Mix increased from 49.0% to 54.0%. The share of electricity from coal fell from 6.8% in 2018 to 2.6% in 2019.

**2.3** The increase in the renewable share to 54% in 2019 is on account of the increased importation of GOs related to renewable sources and the increase in indigenous production of renewable electricity. For the year 2018, the importation of GO certificates amounted to 9.5 million. This increased by 10% to 10.5 million for 2019. This increase was driven by a large increase in the importation of GOs sourced from Biomass.



**2.4** 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 (0.7%) contributes to the “Other” figure, with Non-Biodegradable Waste (0.6%).

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

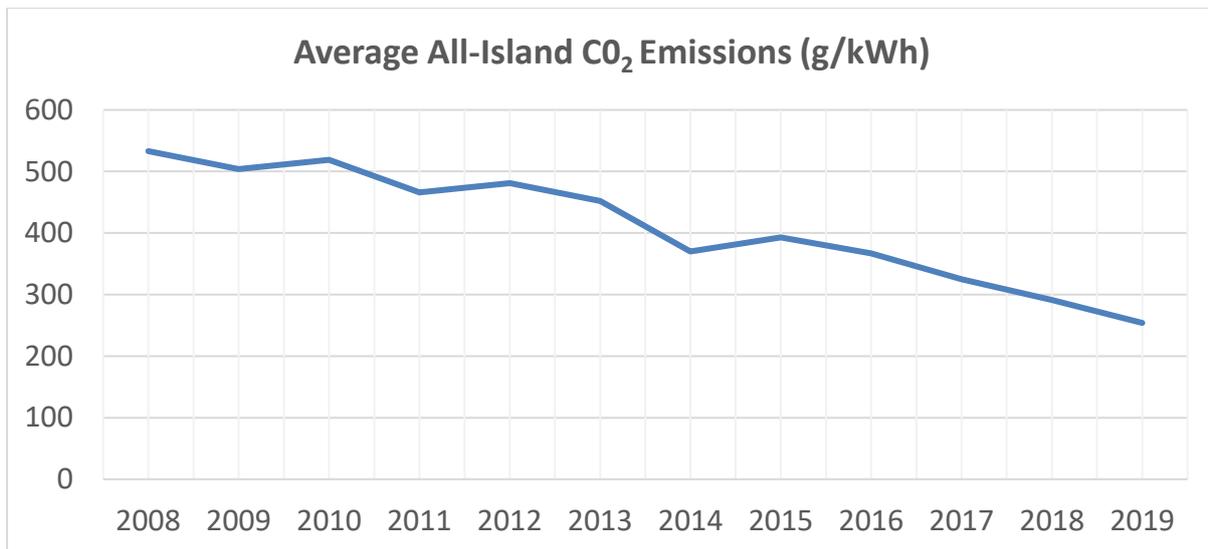
and therefore has no bearing on the All-Island Fuel Mix Disclosure. This applied also in 2019, which means that Nuclear and EU Fossil fuel contributions for the All-Island Fuel Mix in 2019 were zero.

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

**3.1** 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.

**3.2** 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.

**3.3** The average all-island CO<sub>2</sub> emissions per kWh of electricity decreased by 13% between 2018 and 2019, from 291 g/kWh in 2018 to 254 g/kWh in 2019. This is in line with a longer-term downward trend in average CO<sub>2</sub> emissions, having fallen by 52% from 533 g/kWh in 2008, related to the increase in the share of renewable fuel sources, as shown in the graph below.



## 4. SUPPLIERS' FUEL MIX AND CO<sub>2</sub> EMISSIONS 2019

**4.1** Following the presentation in section 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.

**4.2** The fuel mix calculation is carried out on an individual licence basis. Up to and including the 2019 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.

**4.3** 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.

**4.4** Two self-suppliers<sup>5</sup> made declarations for the purposes of fuel mix disclosure. Their 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 may be reviewed as they may detract from the aim of the report.

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<sup>5</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 2019**

| Supplier                | Jurisdiction      | Coal        | Gas          | Peat        | Renew-able   | Oil       | Other       | Emissions (gCO <sub>2</sub> /kWh) |
|-------------------------|-------------------|-------------|--------------|-------------|--------------|-----------|-------------|-----------------------------------|
|                         | <b>All-Island</b> | <b>2.6%</b> | <b>37.9%</b> | <b>4.3%</b> | <b>54.0%</b> | <b>0%</b> | <b>1.2%</b> | <b>254</b>                        |
| <b>Bord Gais</b>        | ROI               | 0.1%        | 68.6%        | 0.2%        | 31.1%        | 0.0%      | 0.0%        | 318                               |
| <b>Budget Energy</b>    | NI                | 4.4%        | 30.9%        | 7.1%        | 55.5%        | 1.1%      | 0.9%        | 276                               |
| <b>Electric Ireland</b> | All-Island        | 2.4%        | 49.6%        | 3.9%        | 42.9%        | 0.6%      | 0.5%        | 300                               |
|                         | ROI               | 2.8%        | 44.0%        | 4.5%        | 47.5%        | 0.0%      | 1.3%        | 284                               |
|                         | NI                | 0.0%        | 90.8%        | 0.0%        | 9.2%         | 0.0%      | 0.0%        | 417                               |
| <b>Energia</b>          | ROI               | 0.0%        | 0.0%         | 0.0%        | 100.0%       | 0.0%      | 0.0%        | 0                                 |
| <b>Just Energy</b>      | ROI               | 0.0%        | 0.0%         | 0.0%        | 100.0%       | 0.0%      | 0.0%        | 0                                 |
| <b>Go Power</b>         | ROI               | 0.0%        | 0.0%         | 0.0%        | 100.0%       | 0.0%      | 0.0%        | 0                                 |
|                         | NI                | 4.5%        | 31.7%        | 7.3%        | 54.4%        | 1.1%      | 1.0%        | 283                               |
| <b>Panda Power</b>      | ROI               | 0.0%        | 0.0%         | 0.0%        | 100.0%       | 0.0%      | 0.0%        | 0                                 |
| <b>Power NI</b>         | NI                | 0.4%        | 63.1%        | 0.7%        | 35.5%        | 0.1%      | 0.1%        | 302                               |
| <b>Click Energy</b>     | NI                | 1.2%        | 8.5%         | 2.0%        | 87.7%        | 0.3%      | 0.3%        | 76                                |
| <b>SSE Airtricity</b>   | ROI               | 0.0%        | 0.0%         | 0.0%        | 100.0%       | 0.0%      | 0.0%        | 0                                 |
|                         | NI                | 0.0%        | 56.9%        | 0.0%        | 43.1%        | 0.0%      | 0.0%        | 261                               |
| <b>Naturgy</b>          | 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                                 |
| <b>Iberdrola</b>        | ROI               | 0.0%        | 0.0%         | 0.0%        | 100.0%       | 0.0%      | 0.0%        | 0                                 |
| <b>Pinergy</b>          | ROI               | 0.0%        | 0.0%         | 0.0%        | 100.0%       | 0.0%      | 0.0%        | 0                                 |
| <b>3T Power</b>         | NI                | 0.0%        | 0.0%         | 0.0%        | 100.0%       | 0.0%      | 0.0%        | 0                                 |

**Table 2: Suppliers assigned the Residual Mix in 2019**

| Suppliers assigned the All Island Residual Mix | Jurisdiction | Coal | Gas   | Peat  | Renew-able | Oil  | Other | Emissions (gCO <sub>2</sub> /kWh) |
|--|--------------|------|-------|-------|------------|------|-------|-----------------------------------|
| <b>Be Energy</b>                               | ROI          | 6.5% | 45.3% | 10.4% | 34.8%      | 1.6% | 1.4%  | 405                               |
| <b>Flogas</b>                                  | ROI          | 6.5% | 45.3% | 10.4% | 34.8%      | 1.6% | 1.4%  | 405                               |
| <b>PrePay Power</b>                            | ROI          | 6.5% | 45.3% | 10.4% | 34.8%      | 1.6% | 1.4%  | 405                               |
| <b>Glowpower</b>                               | ROI          | 6.5% | 45.3% | 10.4% | 34.8%      | 1.6% | 1.4%  | 405                               |

**Table 3: Self-Suppliers' Fuel Mix by Fuel Type in 2019**

| Self-Supplier                  | Jurisdiction | Coal | Gas  | Peat | Renew-able | Oil  | Other | Emissions (gCO <sub>2</sub> /kWh) |
|--------------------------------|--------------|------|------|------|------------|------|-------|-----------------------------------|
| <b>BRI Green Energy Supply</b> | ROI          | 0.0% | 0.0% | 0.0% | 100.0%     | 0.0% | 0.0%  | 0                                 |
| <b>Killowen</b>                | ROI          | 0.0% | 0.0% | 0.0% | 100.0%     | 0.0% | 0.0%  | 0                                 |

## APPENDIX 1: PRESENTATION OF INFORMATION ON BILLS

### Default Presentation of Information<sup>6</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 2019 to December 2019</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>  | <b>100 %</b>                              | <b>100 %</b>  |
| <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>6</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 ALL-ISLAND FUEL MIX 2005-2019

### Fuel Mix 2005-2019 (Percentage share of total)

|                     | 2005  | 2006  | 2007  | 2008  | 2009  | 2010  | 2011  | 2012  | 2013  | 2014  | 2015  | 2016  | 2017  | 2018  | 2019  |
|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <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  |
| <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  |
| <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 |
| <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  |
| <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 |
| <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  |
| <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  |

#### 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 (for those years which it is below the 1% threshold); the Non-Biodegradable Fraction of Waste (NBDFW) and EU Fossil (only for 2011).