SEM Committee Paper

All-Island Fuel Mix Disclosure and CO2 Emissions 2017

Information Paper

SEM-18-051

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Contents

'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) 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 an SEM matter.'

1. INTRODUCTION

1.1 The purpose of this paper is to set out the updated fuel mix and CO2 emissions figures for suppliers operating in the SEM. The fuel mix and CO2 emissions data is taken from data provided to the CRU by SEMO. The disclosures are based on the 2017 calendar year data and must be published on bills no later than two months from the publication of this paper.

1.2 It is the role of the Single Electricity Market Operator (the SEMO) to administer and calculate the fuel mix figures from the information provided by the electricity suppliers. Due to the nature of the certificate based methodology it is important to note that there is no connection between the SEMO calculation for the purposes of the fuel mix disclosure and Ireland's national renewable energy targets under the 2009 Renewable Energy Directive.

1.3 The fuel mix of suppliers and associated environmental impact information (emissions) is calculated for the period from January to December by the SEMO in accordance with the SEM Committee's decisions. This calculation is completed at the end of the second quarter of each year.

1.4 The publication of 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. The methodology used to calculate the fuel mix disclosure figures for 2008, 2009 and 2010 can be found in the SEM Committee[1] Decision Paper *Interim Arrangements: Fuel Mix Disclosure in the SEM* (SEM-09-081).

1.5 This methodology was superseded in 2011 and replaced by SEM Committee Decision Paper *Fuel Mix Disclosure in the Single Electricity Market: Calculation Methodology Decision Paper* (SEM-11-095).

1.6 At a high level, and in accordance with SEM-11-095, the fuel mix figure for a supplier consists of non-renewable generation attributes, Guarantees of Origin and renewable generation attributes assigned to a supplier that are not included in the Guarantees of Origin scheme and the Residual Mix[2] or EU Residual Mix.

1.7 The purpose of the Fuel Mix Disclosure is to provide consumers with information to allow them to understand the environmental impact of the electricity that they buy and choose between suppliers based on their fuel mix and emissions information. The fuel mix of each supplier

[1] The SEM Committee is a Committee of the CRU, the UR and an independent member which, on behalf of the Regulatory Authorities, takes decisions on SEM matters.

[2] 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.

outlined in this report does not necessarily represent metered generation for the same calendar period, as suppliers may claim the attributes of electricity generated outside of the Single Electricity Market through Guarantees of Origin (GOs) imported from other EEA Member States, which do not need to follow the physical flow of electricity.

1.8 Guarantees of Origin are electronic certificates issued for energy generated from renewable sources and are issued to renewable generators that are not in support schemes per MWh of generation. These are tradeable instruments and do not need to follow the flow of energy. Guarantees of Origin Certificates are traded at a European level. The 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. Guarantees of Origin are both imported from and exported to the rest of Europe.

1.9 Renewable generators that are signed up to the Guarantees of Origin 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 the Single Electricity Market Operator (SEMO), which performs the fuel mix calculation on behalf of the Regulatory Authorities.

1.10 Attention is drawn to the following when considering the fuel mix and emissions set out in this document.

- Firstly, the Guarantees of Origin scheme permits transfer of Guarantees of Origin between EEA Member States which, depending on the quantity of Guarantees of Origin imported or exported from Ireland in a given period, has the potential to vary significantly from the actual renewable generation produced within the jurisdiction[3]. The sole function of the GO is to prove that a given share of quantity of energy was produced from renewable source. Only one GO will be issued per MWh of electricity generated and this one GO can only be used once for the purposes of the fuel mix disclosure. Therefore there is no double counting of the same unit of electricity 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 will be used to meet the deficit. This to a lesser extent has the ability to lead to a fuel mix that differs from actual metered generation.

[3] There were 8,151,671 imported Guarantees of Origin declared by suppliers for disclosure in the 2017 fuel mix. One Guarantee of Origin represents 1MWh of electricity produced from a renewable source. The 8,151,671 imported contributed to approximately 37.9% of the overall renewable figure of 21,518,322 MWh.

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.

1.11 The disclosures in this paper are based on the 2017 calendar year data and must be published on bills no later than two months from the publication of this paper.

1.12 The fuel mix information should be presented on 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:

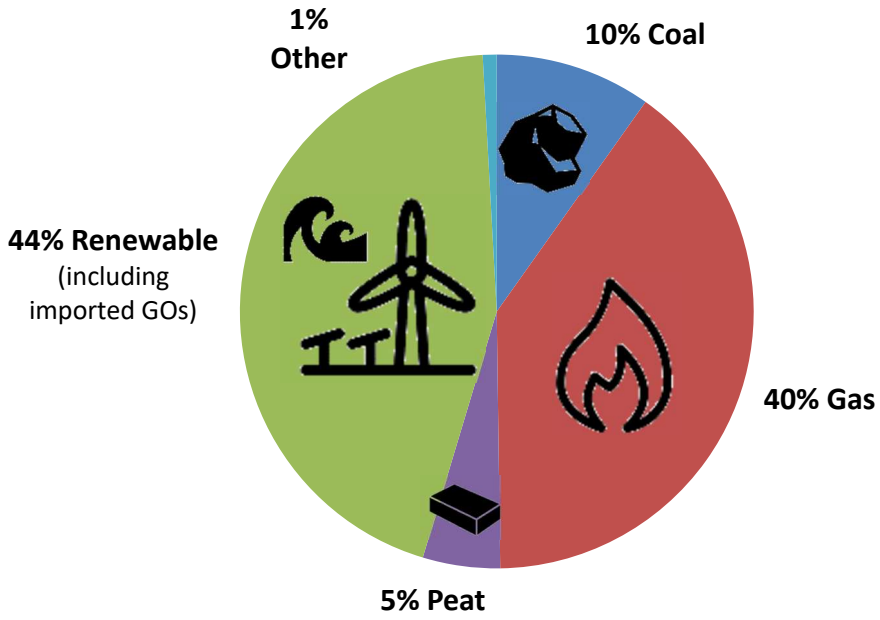
- Where fuel mix information is on the back of bills reference must be made to it on the front of the bill.
- While radioactive waste information is required by the Directive, this figure is 0.000 t/MWh for all suppliers in 2017 and therefore need not be included with the 2017 fuel mix disclosure information on bills.
- To ensure consistency across suppliers, percentages should be rounded to one decimal place.
- CO2 information should be given in the units tonnes of CO2 per MWh (t/MWh).
- 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.
- The 2017 fuel mix information must be on all bills within two months of the publication of this paper.

2. ALL-ISLAND FUEL MIX 2017

2.1 This section sets out the fuel mix for the Al-Island market as a whole. The SEM Committee decision paper SEM-11-095 outlines the calculation methodology which has been used to calculate the fuel mix and CO2 emissions for 2017.

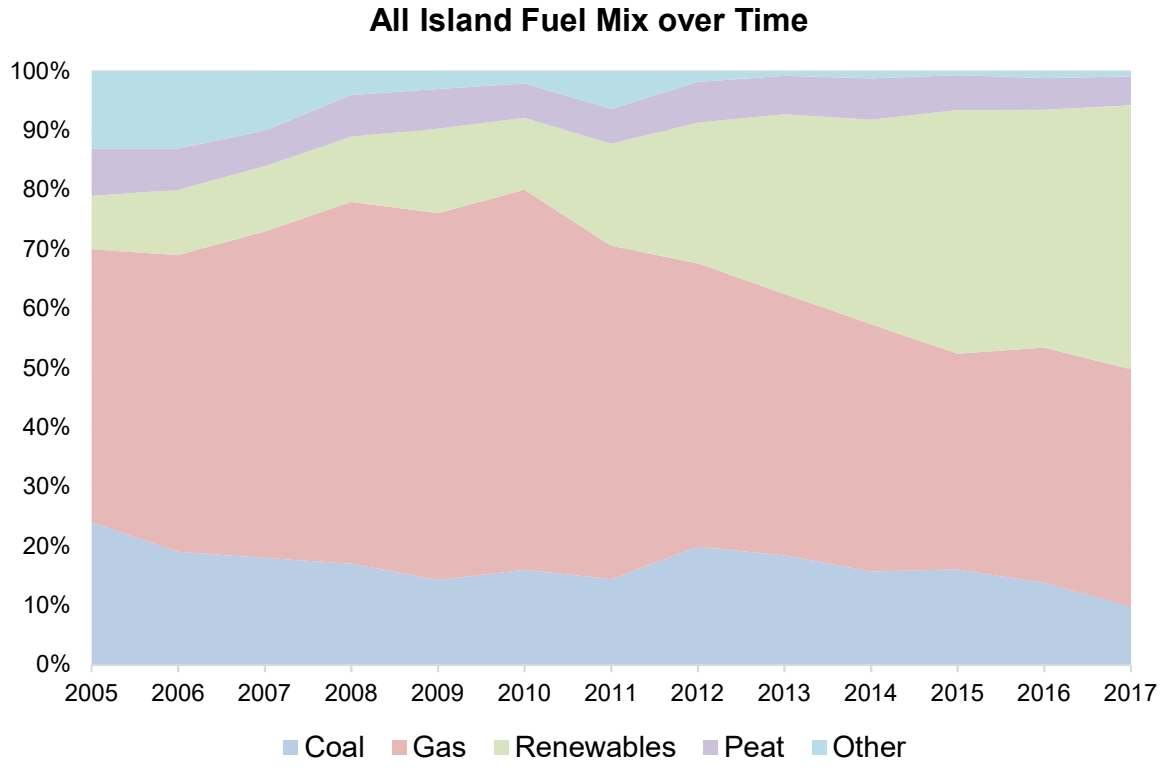
Figure 1 All-Island Fuel Mix 2017

2.2 The use of fossil fuels as a fuel source has decreased from 2016 to 2017. Correspondingly



Sources				
Coal	Gas	Peat	Renewable	Other
9.83%	39.96%	4.86%	44.47%	0.88%
% Change from 2016				
-28.60%	+0.75%	-9.11%	+10.94%	-22.85%

the share of renewable fuel sources has increased by approximately 11% between 2016 and 2017. This has been a continuous trend over the past number of years (as outlined in the graph below).



2.3 The increase in renewable fuel contribution in 2017 can be accounted for due to the following:

- The amount of GO certificates used by suppliers for their fuel mix figures increased from 2016 to 2017.
- The installed capacity of wind increased between 2016 and 2017. This has been an ongoing trend as outlined in the table below.

Table 1 Wind Capacity (MW) at Year End (2017) [4]

Year	Northern Ireland	Republic of Ireland	All Island
2011	515	1,585	2,100
2012	603	1,703	2,306
2013	644	2,008	2,652
2014	733	2,279	3,013
2015	755	2,447	3,203
2016	948	2,779	3,727
2017	1,160	3,311	4,471

[4] EirGrid's Annual Renewable Energy Constraint and Curtailment Report 2017

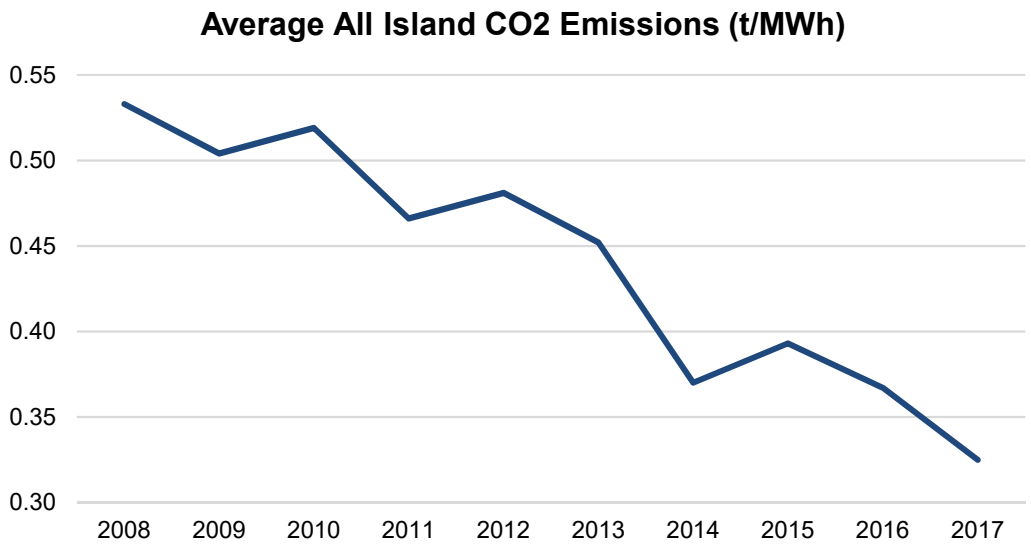
2.4 In accordance with SEM-11-095, the 'other' category consists of all fuels in a given year that represent less than 1% of the final overall generation. Oil (0.60%) contributes to the 'other' figure, with Non-Biodegradable Waste.

3. CO2 EMISSIONS

3.1 Emissions data for each generator in the SEM is supplied annually to SEMO by the EPA (Environmental Protection Agency) and the DAERA (Department of Agriculture, Environment and Rural Affairs).

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 can then be used to calculate the All Island and each Suppliers CO2 Emissions Factor.

3.3 The average All Island CO2 Emissions per MWh of electricity decreased by 13% between 2016 and 2017 from 0.367 t/MWh to 0.325 t/MWh. This is in line with a continuous downward trend in CO2 emissions as a result of the increase in renewable share, as shown in the table below.



4. SUPPLIERS' FUEL MIX AND CO_2 EMISSIONS 2017

4.1 Following the presentation in section 2 of the fuel mix and section 3 on the CO2 emissions data on an All-Island basis, this section sets out the fuel mix and CO2 emissions for each supplier.

4.2 The fuel mix calculation is carried out on an individual licence basis. 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.

4.3 The below table shows the individual fuel mixes and carbon dioxide emissions in tonne per MWh of electricity of each supplier. The All Island fuel mix is also provided for reference. Those suppliers who did not submit a fuel mix declaration have been assigned the residual mix and are highlighted as such in the table.

4.4 Two self-suppliers[5] made declarations for the purposes of fuel mix disclosure. Their fuel mix has been included at the end of the table. However, it should be noted that the purpose of this paper is to provide clarification to customers on the fuel mix of their electricity supply. Therefore, only suppliers serving domestic customers are required to disclose their assigned fuel mix. Submissions received from self-suppliers have been accepted and included in this report due to the low volumes of such submissions received. However, 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, and may detract from the intended aim of the report.

Note*: The fuel mix calculation is carried out on an individual licence basis. When calculating the fuel mix, 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 within the single company prior to using the Residual Mix. Additionally those Suppliers operating in both Ireland and Northern Ireland can choose to have their All Island Fuel Mix calculated or be treated as separate Irish and Northern Irish entities for the FMD calculation (with no All Island Fuel Mix).*

[5] A Self Supplier is a Supplier who, supplies energy only to their own sites, where those sites are not open to competition from other Suppliers, who does not compete to supply energy to any third party and who does not use Market Messages to support their operations.

Table 1 Suppliers' Fuel Mix by Fuel Type in 2017

Supplier	Jurisdiction	Coal	Gas	Peat	Renewable	Oil	Other	tCO2 /MWh
	All-Island	9.8%	40.0%	4.9%	44.5%	0.9%	100.0%	0.325
Bord Gais Energy	ROI	0.0%	76.6%	0.0%	23.4%	0.0%	0.0%	0.330
Budget Energy	NI	20.4%	30.8%	10.1%	36.9%	1.2%	0.6%	0.449
Electric Ireland	All-Island	7.7%	55.9%	3.8%	31.9%	0.5%	0.2%	0.361
	ROI	8.4%	54.4%	4.1%	32.4%	0.5%	0.2%	0.365
	NI	0.0%	73.7%	0.0%	26.3%	0.0%	0.0%	0.318
Energia	All-Island	0.0%	14.8%	0.0%	85.2%	0.0%	0.0%	0.064
	NI	0.0%	91.0%	0.0%	9.0%	0.0%	0.0%	0.393
	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.000
Just Energy Limited	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.000
Go Power	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.000
	NI	22.7%	34.3%	11.2%	29.8%	1.4%	0.6%	0.500
Panda Power	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.000
Power NI	NI	2.5%	81.4%	1.3%	14.6%	0.2%	0.0%	0.390

Click Energy	NI	22.6%	34.1%	11.2%	30.1%	1.4%	0.6%	0.497
SSE Airtricity	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.000
	NI	0.0%	63.9%	0.0%	36.1%	0.0%	0.0%	0.276
Vayu	All-Island	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.000
	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.000
	NI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.000
Suppliers asigned All Island Residual Mix	**Jurisdiction**	**Coal**	**Gas**	**Peat**	**Renewable**	**Oil**	**Other**	**tCO2 /MWh**
Be Energy	ROI	24.8%	37.4%	12.3%	23.3%	1.5%	0.72.2%	0.526
Flogas	ROI	24.8%	37.4%	12.3%	23.3%	1.5%	0.7%	0.526
Pinergy	ROI	24.8%	37.4%	12.3%	23.3%	1.5%	0.7%	0.526
PrePay Power	ROI	24.8%	37.4%	12.3%	23.3%	1.5%	0.7%	0.526
Self-Supplier	**Jurisdiction**	**Coal**	**Gas**	**Peat**	**Renewable**	**Oil**	**Other**	**tCO2 /MWh**
BRI Green Energy Supply	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.000
Killowen Biogas	ROI	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.000

APPENDIX 1 PRESENTATION OF INFORMATION ON BILLS

Default Presentation of Information[6].

Supplier Z Disclosure Label **Applicable Period: January 2017 to December 2017**		
Electricity supplied has been sourced from the following fuels:	**% of total**	
	Electricity Supplied by Supplier Z	**Average for All Island Market (for comparison)**
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 %
Total	100 %	100 %
Environmental Impact		
CO_2 Emissions	X t/MWh	X t/MWh
Your specific fuel mix may differ to the fuel mix shown because SUPPLIER Z offer 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 [7]		

[6] Please refer to SEM-11-095 for further detail on presentation requirements. Note that the fuel categories used each year can vary.

[7] Please see section 3.5.3 from the CRU's decision paper on the Regulation of Green Source Products in the Electricity Retail Market, CER/15/205, for suppliers who offer green source products.

APPENDIX 2 ALL ISLAND FUEL MIX 2005-2017

All Island Fuel Mix 2005-2017

	2005	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*
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%
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%
Gas	46.00%	50.00%	55.00%	61.00%	61.85%	64.06%	56.16%	47.74%	44.09%	41.66%	36.36%	39.66%	39.96%
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%
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%
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%
Other	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%

Note:

- Figures from 2007 relate to Ireland only and calculations are based on 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) referenced in the Related Documents section of this paper.
- 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 (the years it is below 1%); the Non-Biodegradable Fraction of Waste (NBDFW) and EU Fossil (only for 2011).