Fuel Mix Disclosure & CO2 Emissions 2021

October 2022

About the Utility Regulator

The Utility Regulator is the independent non-ministerial government department responsible for regulating Northern Ireland's electricity, gas, water and sewerage industries, to promote the short and long-term interests of consumers.

We are not a policy-making department of government, but we make sure that the energy and water utility industries in Northern Ireland are regulated and developed within ministerial policy as set out in our statutory duties.

We are governed by a Board of Directors and are accountable to the Northern Ireland Assembly through financial and annual reporting obligations.

We are based at Queens House in the centre of Belfast. The Chief Executive leads a management team of directors representing each of the key functional areas in the organisation: Corporate Affairs, Markets and Networks. The staff team includes economists, engineers, accountants, utility specialists, legal advisors and administration professionals.

Our mission

To protect the short- and long-term interests of consumers of electricity, gas and water.

Our vision

To ensure value and sustainability in energy and water.

Our values

- Be a best practice regulator: transparent, consistent, proportionate, accountable and targeted.
- Be professional – listening, explaining and acting with integrity.
- Be a collaborative, co-operative and learning team.
- Be motivated and empowered to make a difference.

Abstract

The purpose of this paper is to set out the 2021 calendar year fuel mix and CO_2 emissions figures for Northern Ireland suppliers operating in the SEM. The disclosures are based on 2021 calendar year data and must be published on bills no later than two months from the publication of this paper.

Audience

Electricity Suppliers, Generators & Consumers

Consumer impact

The Utility Regulator is required to ensure that all suppliers provide (on bills and promotional materials) reliable information regarding the contribution of each energy source to their overall fuel mix and related environmental impact information over the preceding year. The information in this report is used by suppliers to provide information on their websites and on customer bills regarding this fuel mix and environmental impact.

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Executive Summary

The Utility Regulator is required to ensure that all suppliers provide reliable information on bills and promotional materials sent to customers regarding the contribution of each energy source to their overall fuel mix and the associated environmental impacts in the preceding year.

This document sets out the 2021 fuel mixes and CO_2 emissions factors for suppliers licensed in Northern Ireland and operating in the Single Electricity Market (SEM). The figures are calculated in accordance with SEM-11-095 Fuel Mix Disclosure in the Single Electricity Market: Calculation Methodology Decision Paper - FMD Decision Paper

The disclosures are based on the 2021 calendar year data and must be published on bills no later than two months from publication of this paper. Suppliers must make a submission to SEMO; any supplier who chooses not to make a declaration is allocated the residual mix.

Related Documents:

- The SEM All-Island Fuel Mix Disclosure for previous periods can be found here.
- SEM-09-081 Interim Arrangements: Fuel Mix Disclosure in the SEM. Decision paper on the methodology and principals for the calculation of fuel mix disclosure in the SEM.
- SEM-11-095 Fuel Mix Disclosure in the Single Electricity Market: Calculation Methodology Decision Paper

For further information on this paper, please contact Frankie Dodds (frankie.dodds@uregni.gov.uk) at the Utility Regulator.

1. INTRODUCTION

The purpose of this paper is to set out the 2021 fuel mix and CO_2 emissions figures for electricity suppliers operating in Northern Ireland. The fuel mix and CO_2 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 Northern Ireland no later than two months from the publication of this paper.

The fuel mix and CO_2 emissions disclosures for 2021 allow consumers to understand the recent environmental impact of the electricity that they buy, compared to the all-island average. It should be noted that the fuel mix of each supplier outlined in this paper does not necessarily represent metered generation in Northern Ireland, as suppliers on the island of Ireland may claim the attributes of renewable electricity generated outside of the SEM through electronic certificates known as Guarantees of Origin (GOs), imported from EEA Member States[1], which do not need to follow the physical flow of electricity. REGOs sourced from NI or GB are also valid for NI suppliers.

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[2] 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. Generators in the UK who are accredited to the UK-wide RO schemes can also receive

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

[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.

REGOs (For the purpose of this paper GOs/REGOs are referred to as GOs). These are tradeable instruments at European level and do not need to follow the physical flow of energy.

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

- Firstly, the all-island and Northern Ireland fuel mixes - resulting from the application of trading in GOs - have the potential to vary significantly from the actual renewable generation produced. This depends on the quantity of GOs imported or exported 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. 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.

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 Utility Regulator 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;
- While radioactive waste information was required, this figure is zero for all suppliers in 2021 and therefore need not be included with the 2021 fuel mix disclosure information on bills;
- To ensure consistency across suppliers, percentages should be rounded to one decimal place;
- CO_2 information should be given in the unit *grams of CO_2 per kWh* (gCO_2/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 2021 fuel mix information must be on all bills within two months of the publication of this paper.

As a result of Brexit, REGOs from the UK are not acceptable as renewable certificates within EU Member States (including Ireland) since 1 Jan 2021. The following is from the notification from the European Commission[3]:

> *"Guarantees of origin that have been issued by designated bodies in the United Kingdom in accordance with Article 15(2) of Directive 2009/28/EC will no longer be recognised by the EU-27 Member States as of the withdrawal date."*

In November 2020, SEMO – in conjunction with the Regulatory Authorities (RAs) - provided an update on fuel mix disclosure[4]. This is summarised as follows:

- **For Suppliers licensed in Northern Ireland**: Until such time as the United Kingdom (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 Renewable Energy Guarantees of Origin (REGOs) are not accepted for import or cancellation for FMD in Ireland.

The above arrangement is still in place, 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.

Additionally, there may be changes to the approach for the 2022 FMD as a result of consultations that are ongoing by the Department for Business, Energy & Industrial Strategy (BEIS), Ofgem and Department for the Economy (DfE) on the revocation of GOs in the UK.

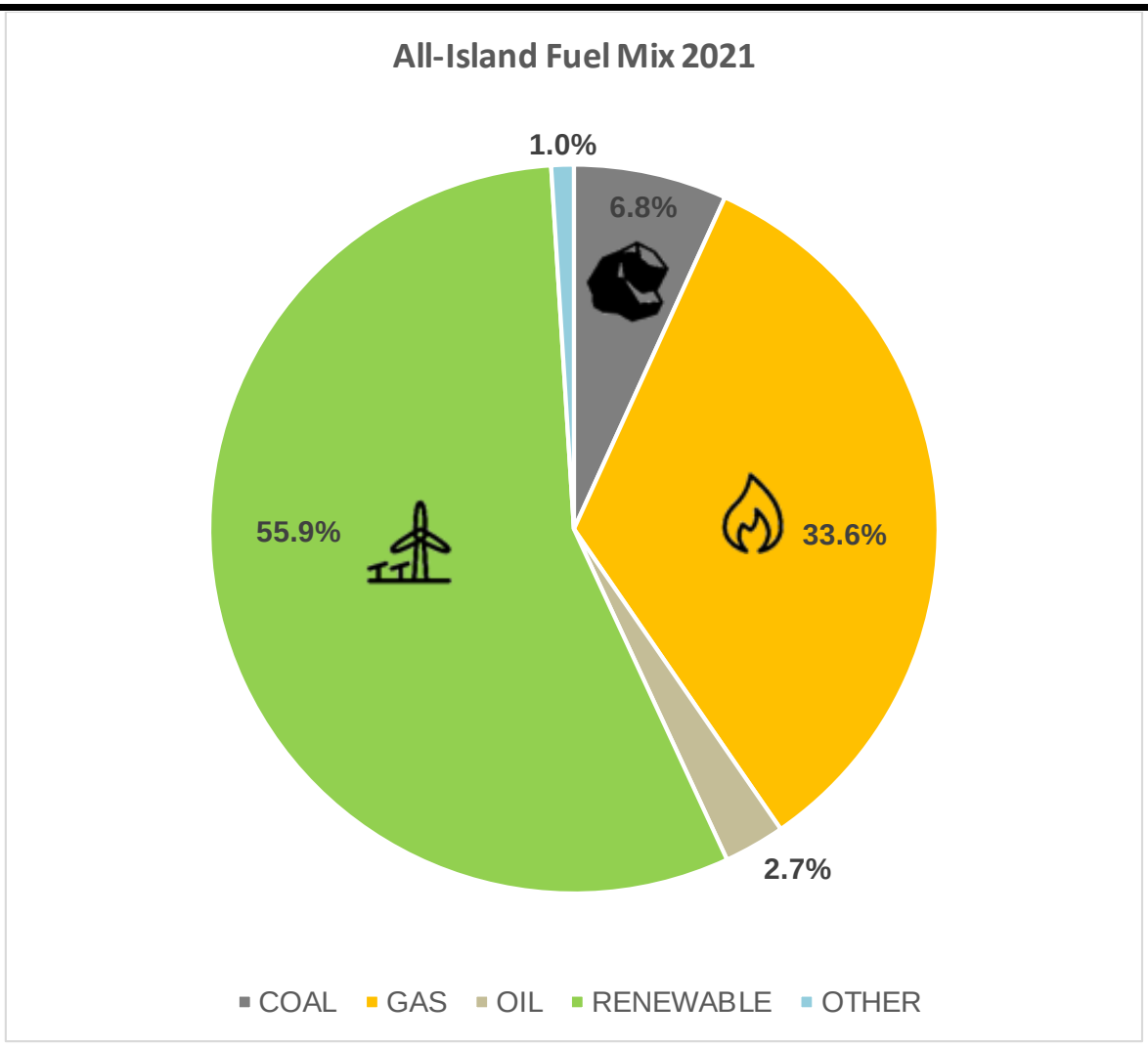
Any changes will be reflected in future FMD processes.

[3] Notification from the European Commission, issued on 7 March 2018.
[4] https://www.sem-o.com/market-messages/message/index.xml?message=3026

2. AVERAGE ALL-ISLAND FUEL MIX

This section sets out the 2021 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



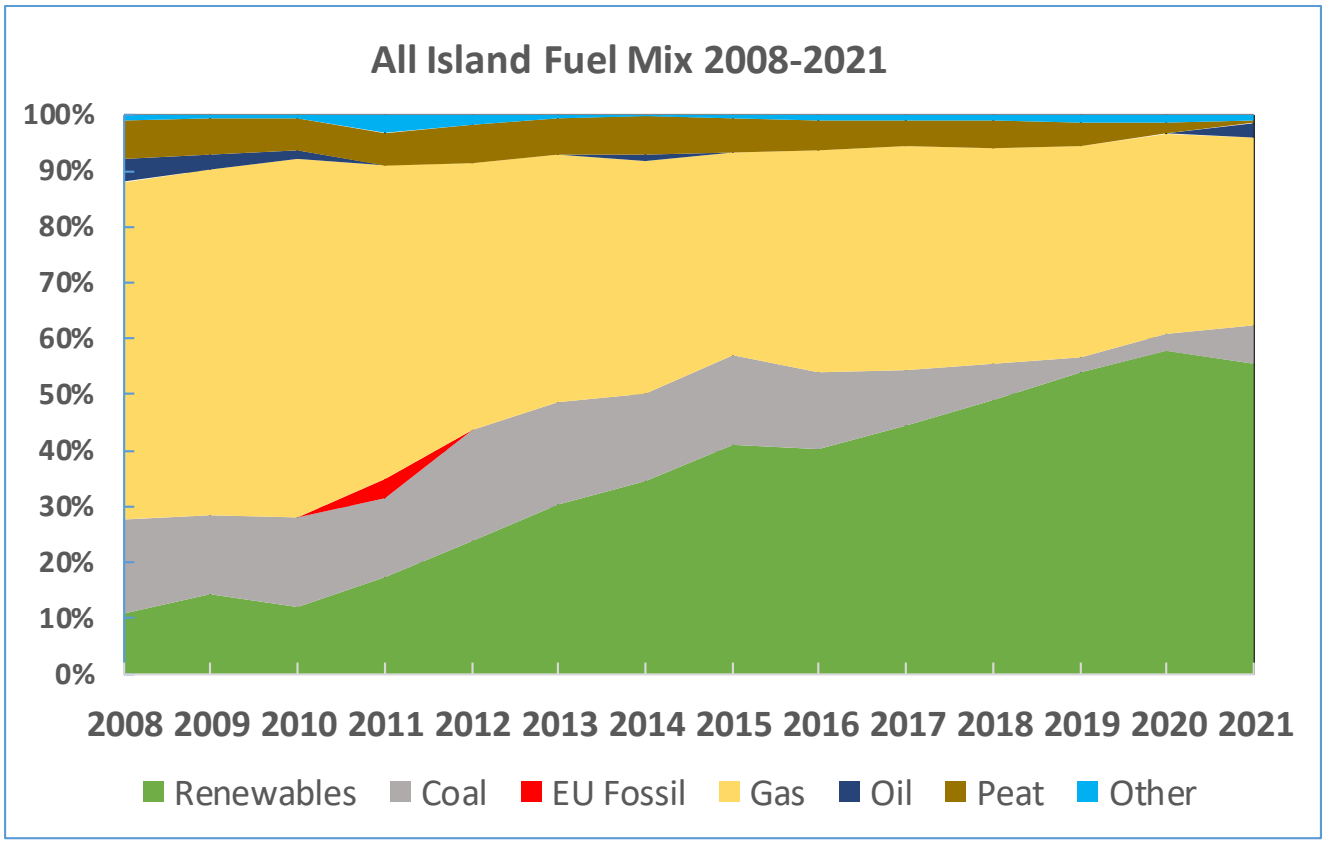
Fuel Mix Disclosure in 2021				
Coal	Gas	Oil	Renewable	Other[5]
6.8%	33.6%	2.7%	55.9%	1.0%
Fuel Mix Disclosure in 2020 (for comparison)				
3.0%	35.8%	0.4%	57.9%	1.3%

[5] For this report in 2021 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 CO_2 emissions for 2021. Figure 1 above shows the average all-island 2021 fuel mix and percentage changes from 2020.

For 2021, the predominant fuels in the final residual mix were gas, renewables, and coal. Coal has climbed back to near 2018 levels due to low wind speeds and power plant closures. Peat generation has decreased significantly since 2017. Renewables for 2021 has decreased marginally by 1.96% bringing it to 55.9%. A large proportion (57%) of the renewables were made up of imports claimed from outside of the SEM. In total, 17,350,039 GOs were imported into Ireland in 2021, a 6% increase from the previous year.

Figure 2: All-Island Fuel Mix 2008-2021



Source: CRU

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 2021 waste to energy (0.5%) and peat (0.5%) meet the criteria for inclusion in the "Other" category

As for previous years, the combined and significant renewable and gas claims meant that

there was a surplus of claims and indigenous generation compared to supplier demand leading to a net surplus of Residual Demand. This meant that there was no need to use the EU Residual Mix for 2021 leading to zero values for Nuclear and EU Fossil which are components of the EU Residual Mix. Table 2 below provides the All-Island Mix by year.

Fuel	2021	2020	2019	2018	2017	2016	2015
Coal	6.8%	2.98%	2.63%	6.77%	9.83%	13.76%	16.02%
EU Fossil	0.0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Gas	33.6%	35.75%	37.86%	38.51%	39.96%	39.66%	36.36%
Nuclear	0.0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Oil	2.7%	0.41%	0.66%	0.59%	0.60%	0.99%	0.49%
Peat	0.5%	2.07%	4.25%	4.63%	4.86%	5.35%	5.90%
Renewable	55.9%	57.86%	54.04%	48.95%	44.47%	40.09%	41.06%
Waste Energy	0.5%	0.94%	0.56%	0.55%	0.28%	0.15%	0.17%

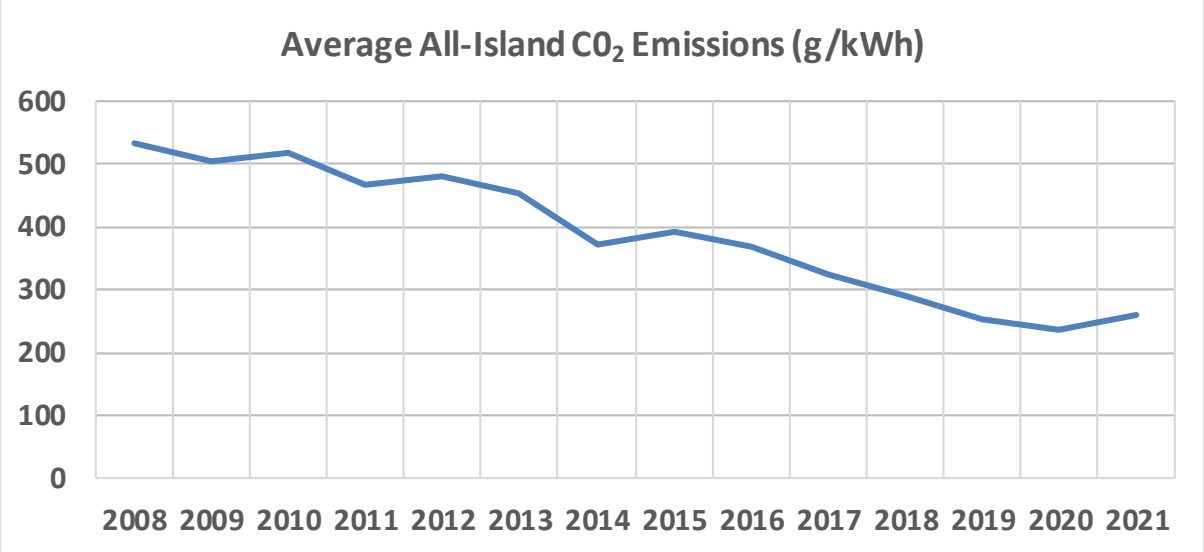
3. AVERAGE ALL-ISLAND CO_2 EMISSIONS

Emissions data for each generator in the SEM is supplied annually to SEMO by the DAERA (Department of Agriculture, Environment and Rural Affairs) for Northern Ireland and 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 can then be used to calculate the average all-island CO_2 Emissions Factor and each individual supplier's CO_2 Emissions Factor.

The average All-Island CO_2 emissions per kWh of electricity has increased by 9.3% between 2020 and 2021, from 236 g/kWh in 2020 to 258 g/kWh in 2021. This increase is predominantly driven by an increase in the reliance on coal-based generation and reduced renewable generation due to lower wind speeds in 2021.

. **Figure 3: Average All-Island CO_2 Emissions**



4. SUPPLIERS' FUEL MIX AND CO_2 EMISSIONS 2019

Following the presentation in section 2 and 3 of average fuel mix and CO_2 emissions across the island, this section sets out the fuel mix and CO_2 emissions for each electricity supplier.

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

Table 3 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 per section 2) is also provided for reference.

Table 3: Suppliers' Fuel Mix by Fuel Type in 2021

Supplier	Jurisdiction	Coal	Gas	Renewable	Oil	Other	Emissions (gCO_2/kWh)
	All-Island	**6.8%**	**33.6%**	**55.9%**	**2.7%**	**1.0%**	**258**
3T Power	NI	0.0%	0.0%	100.0%	0.0%	0.0%	0
Budget Energy	NI	0.0%	0.0%	100.0%	0.0%	0.0%	0
Click Energy	NI	10.0%	30.9%	53.7%	3.9%	1.5%	293
Electric Ireland	All-Island	2.4%	31.0%	65.3%	0.9%	0.4%	179
	NI	0.0%	66.9%	33.1%	0.0%	0.0%	306
Flogas Enterprise Solutions	NI	0.0%	0.0%	100.0%	0.0%	0.0%	0
GO Power	NI	15.6%	48.6%	27.3%	6.1%	2.4%	460
Power NI	NI	0.0%	69.1%	30.9%	0.0%	0.0%	316
SSE Airtricity	NI	0.0%	41.9%	58.1%	0.0%	0.0%	191

APPENDIX 1 PRESENTATION OF INFORMATION ON BILLS

Default Presentation of Information[6]

Supplier Z Disclosure Label **Applicable Period: January 2021 to December 2021**		
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 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 www.SUPPLIER Z.co.uk or, for further details call 00XXX X XXX XXXXX		

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

APPENDIX 2 ALL-ISLAND FUEL MIX 2005-2019

Fuel Mix 2005-2021 (percentage share of total)

Fuel Mix 2005-2021 (Percentage share of total)

	2008	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*
Coal %	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
EU Fossil %	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
Gas %	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	33.60
Oil %	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
Renewables %	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
Peat %	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
Other %	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	0.50

Note:

- Figures for 2008, 2009 and 2010 are based on the Interim Arrangements Methodology (SEM-09-081).
- Figures for 2011 onwards relate to Northern Ireland and 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).