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# Energy in Northern Ireland 2018

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# Reader Information

## **Purpose**

This publication aims to provide a comprehensive and accessible overview of key statistics and information relating to energy in Northern Ireland. The report endeavours to present a disparate range of existing and emerging information and statistics into a single coherent source. The majority of statistics and data included are National Statistics or Official Statistics sourced from producers such as the Department for Business, Energy and Industrial Strategy (BEIS), the Northern Ireland Statistics and Research Agency (NISRA) and the Office for National Statistics (ONS) among others.

## **Reporting Period**

The data presented in the report was the most up-to-date available at the time of publication. Where possible, data for 2017 or 2018 has been used although some data relates to earlier periods. All links to other websites, reports, datasets etc. given in this report were accurate as at June 2018.

## **Target audience**

This publication is intended to be helpful and informative to a wide range of stakeholders with an interest in the energy sector including: Department for the Economy (DfE), elected representatives, academics, energy interest groups, the media and general public.

## **Next Updates**

It is intended that this report will be updated in full every two years. Therefore, the next edition will be published during 2020.

## **An Official Statistics Publication**

Official Statistics are produced to a high professional standard. They undergo regular quality assurance reviews to ensure that they meet customer needs. They are produced free from any political interference. As we want to engage with users of our statistics, we invite you to feedback your comments on this publication to [sean.donnelly@economy-ni.gov.uk](mailto:sean.donnelly@economy-ni.gov.uk).





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## Chapter 1: Northern Ireland in Context

The scale and nature of energy within any given country or region is shaped by a complex inter-play of factors and, inevitably, direct comparisons between differing regions or countries in respect of energy generation, distribution and consumption will reflect these factors. The following key facts relating to Northern Ireland, its geography, climate, population and economy are intended to provide a broad scene setting context for the picture of energy in Northern Ireland as rehearsed in this report.

### Geography

- Northern Ireland is situated on the north eastern part of the island of Ireland, sharing a land border with the Republic of Ireland to the south and west, and is dependent on air and sea routes for travel and connectivity within the United Kingdom.

### Climate<sup>1</sup>

- The climate of Northern Ireland is characterised by equability, a consequence of the moderating effects of the Atlantic Ocean bringing relatively mild winters and cool summers. However, the indented shape of the coastline and the presence of high ground introduce localised differences in temperature, cloud and precipitation.
- The mean annual temperature at low altitudes in Northern Ireland varies from about 8.5 °C to 10.0 °C, with the higher values occurring around or near to the coasts. The January mean daily minimum temperatures vary from about 0.5 °C in the upland areas to about 2.5 °C on the coast. July is normally the warmest month in Northern Ireland, with mean daily maximum temperatures varying from about 17.5 °C in the upland areas and along the north coast to almost 20 °C in low lying areas south of Lough Neagh and in Fermanagh.
- Northern Ireland is one of the windier parts of the UK, with the windiest areas being over the highest ground and along the coasts of Counties Antrim and Down. The strongest winds are associated with the passage of deep areas of low pressure close to or across the UK. The frequency and strength of these depressions is greatest in the winter half of the year, especially from November to January, and this is when mean speeds and gusts (short duration peak values) are strongest.
- On the whole, Northern Ireland is cloudier than England because of the hilly nature of the terrain and the proximity to the Atlantic. The dullest parts of Northern Ireland are the upland areas of the north and west, with annual average sunshine totals of less than 1,100 hours. Mean monthly sunshine figures reach a maximum in May and are at their lowest in December. Whilst the key factor is variation in the length of the day through the year, cloud cover plays a part as well. A feature is the reduction in mean monthly sunshine that typically occurs in July and August, accompanied by increased cloudiness, which is associated with an increase in the prevalence of westerly winds.

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<sup>1</sup> <http://www.metoffice.gov.uk/climate/uk/regional-climates/ni>

## Land area

- At an area of 13,843 km<sup>2</sup>, Northern Ireland comprises around 16% of the area of the island of Ireland and around 5% of the United Kingdom.
- The coastline of Northern Ireland comprises some 373 kilometres accounting for approximately 12% of the coastline of the island of Ireland (3,170 km).
- Of Northern Ireland's 1.8 million people, over six in ten (63%) live in a small/medium/large town or city with one in ten living in an intermediate settlement or village and just over one quarter (28%) living in open countryside or in a settlement of less than 1,000 people<sup>2</sup>.

## Population

- The Northern Ireland population in mid-2016 was estimated to be 1.862 million people. The number of children aged 0 to 15 years was 388,000 (20.6%), the working age population (persons aged 16 to 64) was 1,176,400 (63.2%) whilst the older population (persons aged 65 and over) was 297,800 (16%)<sup>3</sup>.
- The Northern Ireland population is projected to grow from 1.862 million in 2016 to 1.896 million people by 2020, 1.933 million by 2025, 1.961 million by 2030 and 1.982 million by 2035. Projected population growth from 2016 to 2035 is therefore estimated to be around 6.4%.
- Projections for the number of households in Northern Ireland (2012 based) indicate growth from 708,601 households in 2012 to 743,461 in 2020, 768,279 in 2025, 789,857 in 2030 and 807,004 in 2035<sup>4</sup>. Projected growth in the number of households from 2012 to 2035 is therefore estimated to be 13.9%.
- At 2016, the number of people per square kilometre was 137 for Northern Ireland, 424 for England, 150 for Wales and 69 for Scotland<sup>5</sup>.
- In 2016-17 and compared to England (77%), households in Northern Ireland (80%) report a slightly higher level of car ownership which has been a consistent picture over recent years<sup>6</sup>.
- In Northern Ireland in 2016, over half (61%) of all private and light goods vehicles registered were diesel fuelled whilst 39% were petrol<sup>7</sup>.

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<sup>2</sup> <http://www.nisra.gov.uk/archive/geography/review-of-the-statistical-classification-and-delineation-of-settlements-march-2015.pdf>

<sup>3</sup> <https://www.nisra.gov.uk/statistics/population/national-population-projections>

<sup>4</sup> <http://www.nisra.gov.uk/demography/default.asp21.htm>

<sup>5</sup> <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland>

<sup>6</sup> <https://www.infrastructure-ni.gov.uk/publications/northern-ireland-transport-statistics-2016-2017>

<sup>7</sup> <https://www.infrastructure-ni.gov.uk/publications/northern-ireland-transport-statistics-2016-2017>

## Housing

- At Census 2011, Northern Ireland's household accommodation type comprised 38% detached housing, 28% semi-detached, 25% terraced and 9% flats/apartments. By comparison for the UK as a whole, household accommodation type comprised 23% detached housing, 30% semi-detached, 24% terraced and 22% flats/apartments<sup>8</sup>.
- In terms of energy efficiency of the housing stock in Northern Ireland, the Standard Assessment Procedure (SAP) is Government's standard method of rating the energy efficiency of a dwelling, with a higher SAP rating indicating better energy efficiency. In 2016, and based on the SAP 2012 methodology, this averaged 66.3 for Northern Ireland<sup>9</sup> compared to an average of 61.5 for England<sup>10</sup> in 2015.
- In Northern Ireland in 2016<sup>11</sup>, household central heating systems were mostly oil fired (68% of households) compared to 24% with gas central heating and 8% other central heating including solid fuel, electric and dual fuel systems.

## Economy

- The number of Pay As You Earn (PAYE) or VAT registered businesses in Northern Ireland at 2017 was 71,615. For the UK as a whole, there were 2.67 million businesses registered in 2017<sup>12</sup>.
- In 2017, just under half of all registered businesses in Northern Ireland were within the agriculture (25%), construction (14%), and retail (8%) sectors. By comparison the agriculture sector accounted for 6% of all UK registered business, with 12% in construction and 7% in retail<sup>13</sup>.
- The Office for National Statistics (ONS) estimates of Gross Value Added (Balanced) from 1998 to 2016 for the regions and sub-regions of the UK, including Northern Ireland indicate: the local economy's workplace GVA, in chained volume measures, increased by 1.1 per cent in 'real' terms from 2015 to 2016, which was below the overall UK rate of growth of 1.6 per cent; between 2015 and 2016, real GVA increased in all of the UK's 12 NUTS1 regions except for the North East (-1.0%); Northern Ireland GVA per head in 2016 grew by 2.8% in current basic prices (to £19,997) between 2015 and 2016, which matched growth in the UK; both Wales and the North East had lower GVA per head than Northern Ireland (£19,140 and £19,218 respectively); and Northern Ireland GVA per head was 75.9 per cent of the UK figure (£26,339) which was unchanged from 2015<sup>14</sup>.

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<sup>8</sup> 2011 Census: Key Statistics and Quick Statistics for local authorities in the United Kingdom

<sup>9</sup> [https://www.nihe.gov.uk/index/corporate/housing\\_research/house\\_condition\\_survey.htm](https://www.nihe.gov.uk/index/corporate/housing_research/house_condition_survey.htm)

<sup>10</sup> <https://www.gov.uk/government/statistics/english-housing-survey-2015-to-2016-headline-report>

<sup>11</sup> <https://www.gov.uk/government/statistics/english-housing-survey-2015-to-2016-headline-report>

<sup>12</sup> <https://www.nisra.gov.uk/statistics/business-statistics/inter-departmental-business-register>

<sup>13</sup> <https://www.nisra.gov.uk/statistics/business-statistics/inter-departmental-business-register>

<sup>14</sup> <https://www.nisra.gov.uk/statistics/economic-output-statistics/gross-value-added>

- The Northern Ireland Composite Economic Index (NICEI)<sup>15</sup> is an experimental quarterly performance of the Northern Ireland economy. Compared to a baseline of 100 in 2015, the results for 2017 quarter 3 show that over the last two years annual output increased by 1.8%. Although the measures are not produced on a fully equivalent basis, comparisons with the UK over the same period show that the NICEI grew at a similar rate (1.8%) compared to UK GDP growth (1.9%).

On a longer timeframe from 2006 and baselined at 2015, peak economic performance in Northern Ireland occurred in quarter 4 2006 at 109, whilst the minimum performance at 96.8 occurred in quarter 2 2013.

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<sup>15</sup> <https://www.nisra.gov.uk/publications/nicei-publication-and-tables-q3-2017>

## Chapter 2: Energy and the Economy

### Summary of key points

#### Activity-Based: Low Carbon and Renewable Energy Economic Contribution

- In the three year period 2014-2016 in Northern Ireland, an estimated annual average of around £1 billion in turnover and 5,500 full time equivalent (FTE) jobs were generated directly by businesses active in the LCRE economy in each of the years 2014 to 2016.
- Over the period 2014-2016, businesses in Northern Ireland annually generated an average of 2.3% of direct UK LCRE turnover (i.e. £1.0 billion out of £43.1 billion) and provided 2.6% of direct UK LCRE full-time equivalent employment (i.e. around 5,500 out of some 216,000 direct FTE employees).
- Of the total LCRE activity in Northern Ireland in 2016, Energy Efficient Products was the group that accounted for the largest proportion of direct turnover (33%) and direct FTE employees (50%).
- In Northern Ireland, an estimated annual average of £1.7 billion in turnover and 11,500 full-time equivalent jobs were generated directly and indirectly by businesses active in the LCRE economy in each of the years over the period 2014-2016.
- Over the period 2014-2016, indirect activity accounted for an annual average of 44% of total Northern Ireland turnover from the LCRE economy (about £0.8bn) and an annual average of 51% of full-time equivalent employment (6,000).

#### Sector-Based: Energy Economic Contribution

- In 2015, over 2,650 employee jobs were in the energy sector (constructed from a combination of Standard Industrial Classification codes) in Northern Ireland, a 19% rise in jobs in this sector since 2013.
- The total number of energy sector enterprises in Northern Ireland increased from 375 in 2013 to 705 in 2017, an increase of 88%. This was the largest percentage increase of all UK countries. The major contributing factor to the overall rise in the number of energy sector enterprises was the large increase (+182%) in the 'Electricity, gas, steam and air conditioning supply' sector.
- Gross Value Added (GVA) per head in Northern Ireland for businesses operating in the 'Electricity, gas, steam and air conditioning supply' sector in 2016 was around five times higher than the 'all sectors' average for Northern Ireland.

## Introduction

This chapter presents information on the number of businesses, turnover and employment from a UK-wide business survey of Low Carbon and Renewable Energy economic activity. It also provides some information on employment, economic output and the number of registered enterprises in Northern Ireland's energy sector using other definitions and sources.

### Low Carbon and Renewable Energy Economy (LCRE) survey

The Low Carbon and Renewable Energy Economy (LCRE) survey<sup>16</sup> was despatched for the first time in 2015, for the reporting year 2014, to a sample of some 41,500 UK businesses. Drawing on the experience from the first survey, it was possible to significantly reduce the sample size and hence reduce the burden to businesses for the second and third runs of the survey with around 14,000 UK businesses sampled in the 2015 and 2016 survey years (of which around 1,300 were businesses in Northern Ireland). The survey was designed by the Office for National Statistics (ONS) to provide greater detail on low carbon and renewable energy activities in the UK and its regions, following demand from stakeholders for official statistics on this topic. The survey was developed in consultation with stakeholders from UK and devolved government departments, including the Department for the Economy.

The LCRE survey collected information on business activity across a number of Low Carbon and Renewable Energy activities such as: electricity production from wind, solar, hydropower or other sources; the design, manufacture or installation of energy efficient products; the design, production and installation of infrastructure for generating heat directly through solar, thermal, geothermal or other means (i.e. renewable heat); the design and manufacture of vehicles with specific technology to significantly reduce or remove emissions; and the design, manufacture and installation of fuel cells and energy storage systems. A full list of all 17 sectors can be found in Annex 2.1.

It is worth noting that the LCRE survey collected information from businesses where some or all of their activities could be defined as low carbon or renewable energy activities. Indeed, Low Carbon and Renewable Energy activities were the primary activity of only around one quarter (27.2%) of all businesses active in the LCRE economy across the UK in 2016<sup>17</sup>. Also, the financial sector was excluded and the LCRE survey therefore reports on the non-financial business economy.

The key variables collected by the LCRE survey were turnover and employment. The main results for Northern Ireland, along with comparisons to England, Scotland, Wales and the UK are presented below.

### LCRE Headline Results by Region

Estimates from the LCRE are survey-based estimates. Surveys gather information from a sample rather than from the whole population and results from sample surveys are always estimates and not precise figures. This means that they are subject to some uncertainty and this can also have an impact on how changes in the estimates over time should be interpreted. A more complete picture of how the LCRE economy is changing over time will be possible once longer-term trends are available. Whilst the ONS

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<sup>16</sup> A copy of the main release and data tables is available [here](#)

<sup>17</sup> Low Carbon and Renewable Energy activity is classed as the primary activity of a business if 50% or more of its full-time equivalent (FTE) employees are working in the Low Carbon and Renewable Energy sectors. See [here](#) for further details.

report and associated tables will show estimates for individual years for Northern Ireland, the preference here, given the LCRE is a new sample survey which is still subject to ongoing development, is to show (where possible) an annual average for the three year period 2014-2016 for the key variables (employment and turnover).

Table 2.1 Direct, Indirect & Total Activity Key Statistics: Annual average LCRE turnover and Full-Time Equivalent (FTE) employment by UK country, 2014-2016

	Turnover (£billion)				Employees (FTE)			
	Direct	Indirect	Total	As a % of UK Total Activity	Direct	Indirect	Total	As a % of UK Total Activity
UK	42.4	34.8	77.1	100.0%	216,000	189,500	405,000	100.0%
England	33.8	27.3	61.1	79.2%	176,500	150,500	327,000	80.7%
Scotland	5.6	5.1	10.7	13.8%	22,500	23,000	45,500	11.2%
Wales	2.0	1.6	3.6	4.7%	11,000	10,000	21,000	5.2%
<b>Northern Ireland</b>	1.0	0.8	1.8	2.3%	5,500	6,000	11,500	2.8%

Source: Office for National Statistics [See Annex 2.2 for notes to this table]

### Direct Activity

Table 2.1 shows that in the three year period 2014-2016 in Northern Ireland, an estimated annual average of around £1 billion in turnover and 5,500 full time equivalent (FTE) jobs were generated directly by businesses active in the LCRE economy in each of the years 2014 to 2016. Over the period 2014-2016, businesses in Northern Ireland annually generated an average of 2.3% of direct UK LCRE turnover (i.e. £1.0 billion out of £42.4 billion) and provided 2.6% of direct UK LCRE full-time equivalent employment (i.e. around 5,500 out of some 216,000 direct FTE employees).

Over the period 2014-2016, England accounted for around four-fifths of both direct annual average UK LCRE turnover (79.7%) and UK LCRE direct annual average employment (81.7%). Businesses in Scotland engaged in LCRE activities provided some 13.1% of direct annual average UK LCRE turnover and 10.4% of UK LCRE direct annual average employment. Direct LCRE annual average turnover and employment in Wales was around twice that of Northern Ireland.

### Indirect and Total Activity<sup>18</sup>

Table 2.1 also shows estimates of indirect and total activity. The total activity estimates were calculated by constructing multipliers for each LCRE sector, both for the UK as a whole and for each UK country. Direct turnover and employment for each region, group and sector were multiplied by

<sup>18</sup> Estimates of indirect turnover and employment generated by the low carbon and renewable energy (LCRE) economy are classified as Experimental Statistics but they have undergone the same high levels of quality assurance as other official statistics. However, as Experimental Statistics, the methodology used to create them remains under development and may be revised following further evaluation. It is therefore recommended that this is taken into account when using the findings.



the corresponding multipliers to yield an estimate of total activity generated. The difference between the direct activity and the calculated total estimate is the indirect activity.

Most economic transactions increase economic activity by a larger amount than their size – this is because any transaction results in an increase in another economic actor’s income or demand for an input, which in turn results in an increase in their spending, or investment. Multipliers are used to estimate the indirect effect an economic activity has on the wider economy, such as additional activity due to demand generated for the products of other firms by the wages paid to employees, or the increase in demand for the inputs used. A multiplier effect is the impact an economic transaction has on the wider economy; the multiplier measures the overall increase in economic activity resulting from the transaction, proportional to its size.

Table 2.1 shows that, for Northern Ireland, an estimated annual average of £1.8 billion in turnover and 11,500 full-time equivalent jobs were generated directly and indirectly by businesses active in the LCRE economy in each of the years over the period 2014-2016. Over the period 2014-2016, indirect activity accounted for an annual average of 44% of total Northern Ireland turnover from the LCRE economy (about £0.8bn) and an annual average of 52% of FTE employment (6,000). Between 2014 and 2016, businesses in Northern Ireland annually generated an average of 2.3% of total UK LCRE turnover and provided 2.8% of total UK LCRE full-time equivalent employment.

### LCRE Activity by Group

The headline results for Northern Ireland shown above can also be broken down into broad groups as shown in Table 2.2 below. These groups are aggregations of the 17 sectors within scope of the LCRE survey. Further details on which sectors fit into each group is detailed in Annex 2.1.

Table 2.2 Annual Average Direct, Indirect & Total Activity: LCRE turnover and FTE employment by Group, Northern Ireland 2014-2016<sup>19</sup>

	Turnover (£million)			Employees (FTE)		
	Direct	Indirect	Total	Direct	Indirect	Total
Low Carbon Electricity	285.0	257.5	542.3	1,000	1,000	1,500
Low Carbon Heat	45.7	32.0	77.5	500	500	1,000
Energy from Waste & Biomass	*	*	*	<500	<500	<500
Energy Efficient Products	307.7	213.0	520.7	3,000	2,000	5,000
Low Carbon Services	8.8	5.2	14.0	<500	<500	<500
Low Emission Vehicles	*	*	*	1,500	2,500	4,000
Total	975.8	780.7	1,756.7	5,500	6,000	11,500

Source: Office for National Statistics [See Annex 2.3 for notes to this table]

Note that estimates in italics in Table 2.2 above have a coefficient of variation (which is a measure of the error around an estimate) that is greater than or equal to 20% and these estimates should therefore be used with caution. Further details on this are given in Annex 2.3.

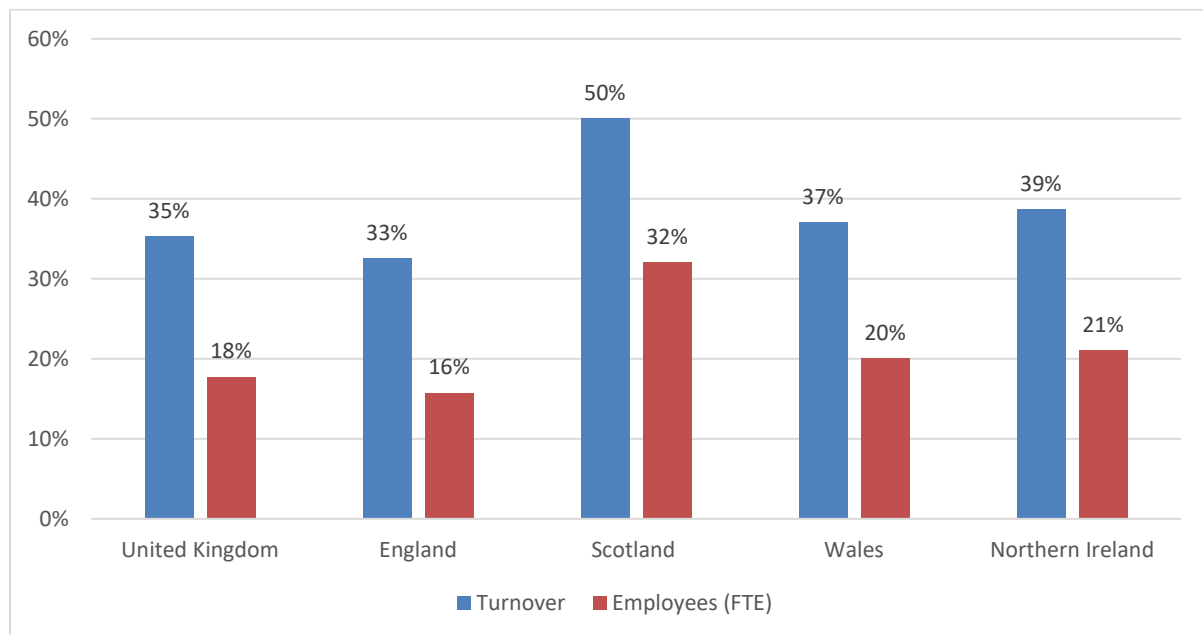
<sup>19</sup> Cells in the table marked \* are figures that have been suppressed to avoid disclosure of individual company details.

Of the total annual average LCRE activity in Northern Ireland in the period 2014-2016, the table shows that Energy Efficient Products was the group that accounted for the largest proportion of annual average direct turnover (32%) and annual average direct employees (55%). The Low Carbon Electricity group accounted for around one third of direct (29%) and total turnover (31%) but only 18% of direct and 13% of annual average total employees. Whilst information on turnover for the Low Emission Vehicles<sup>20</sup> group is not available (due to the small number of businesses operating in this sector), this group accounted for over one third of the annual average total FTE employees in Northern Ireland.

### Renewable Energy Group

This section looks at the low carbon and renewable energy (LCRE) sectors that can be grouped together to represent the Renewable Energy Group. The sectors classified as renewable energy are: offshore wind, onshore wind, solar photovoltaic, hydropower, other renewable energy, bioenergy, alternative fuels, renewable heat and renewable combined heat and power.

Chart 2.1 Percentage of Turnover and Employment contributed by the Renewable Energy Group, by country, annual average 2014-2016



Source: Office for National Statistics

Over the period 2014-2016, the renewable energy group accounted for an annual average of over one-third of all UK LCRE turnover (35%) and around one-fifth of UK LCRE full-time equivalent (FTE) employees (18%). The renewable energy group was particularly important in Scotland, where it accounted for half of annual average LCRE turnover and almost one-third of annual average LCRE employment in the period 2014-2016. In Northern Ireland, the renewable energy group accounted for about two-fifths of all LCRE turnover (39%) and one-fifth of LCRE employment (21%) in the period 2014-2016. Wales had very similar proportions to Northern Ireland.

<sup>20</sup> Low Emission Vehicles group includes Low Emission Vehicles & Infrastructure and Fuel Cells & Energy Storage sectors.

## Energy Sector using data from other sources

Whilst the data from the Low Carbon and Renewable Energy Economy survey presented above gives details of such activity across all businesses in the non-financial sector in Northern Ireland, there are other sources of data which can provide a longer time series and some more detailed breakdowns in terms of the number of businesses, employment, Gross Value Added and turnover in the broader energy sector.

The following data is based on a definition of the energy sector using aggregations of individual Standard Industrial Classification<sup>21</sup> groups. The Standard Industrial Classification (SIC) is a system that is used to classify businesses by the type of economic activity in which they are engaged. Whilst the following data is useful, it should be borne in mind that the Standard Industrial Classification system does not lend itself to measuring non-traditional or new sectors that straddle a number of different industries – like the renewable energy sector and low carbon economy<sup>22</sup>. However, the SIC-based energy sector data presented below will include activities such as mining and extraction (though there are few businesses in Northern Ireland engaged in such activities) but also electricity generation from traditional (fossil fuel based) plants that would not be covered in the Low Carbon and Renewable Energy Economy survey data presented earlier.

## Energy Sector Enterprises

The total number of energy sector<sup>23</sup> enterprises in Northern Ireland increased from 375 in 2013 to 705 in 2017 (an increase of 88%). Over the same period, the total number of enterprises in Northern Ireland increased by 6%.

The major contributing factor to the overall rise in the number of energy sector enterprises is the large increase (182%) of the number of enterprises in the SIC division ‘Electricity, gas, steam and air conditioning supply’: up from 140 in 2013 to 395 in 2017. Indeed, the majority of enterprises in this sector in 2017 (around 375 of the 395 businesses, or 95%) were in the SIC group 35.1: Electric power generation, transmission and distribution, and there were three times as many enterprises in this SIC group in 2017 (375) compared to 2010 (125). This trend coincides with the large growth in recent years in the number of renewable electricity producers in Northern Ireland.

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<sup>21</sup> More information on the Standard Industrial Classification can be found [here](#)

<sup>22</sup> See page 19 of <http://www.gov.scot/Resource/0049/00493652.pdf>

<sup>23</sup> Based on the Standard Industrial Classification (SIC) definition using the following SIC codes: 05, 06, 09, 19, 20.14, 35, 36, 38.22, 71.12/2 and 74.90/1.

Table 2.3 Number<sup>24</sup> of Energy Enterprises<sup>25</sup> in Northern Ireland, 2013 to 2017 (March of each year)

	2013	2014	2015	2016	2017
SIC 05: Mining of coal and lignite	0	0	0	0	0
SIC 06: Extraction of crude petroleum and natural gas	0	5	0	0	0
SIC 09: Mining support service activities	5	10	15	10	5
SIC 19: Manufacture of coke and refined petroleum products	5	5	5	5	5
SIC 20.14: Manufacture of other organic based chemicals	0	0	0	0	0
SIC 35: Electricity, gas, steam and air conditioning supply	140	205	240	335	395
(SIC 35.1: Electric power generation, transmission and distribution)	(125)	(195)	(225)	(315)	(375)
SIC 36: Water collection, treatment and supply	10	10	5	10	10
SIC 38.22: Treatment and disposal of hazardous waste	5	0	0	0	0
SIC 71.12/2: Engineering related scientific and technical consulting activities	180	195	220	245	240
SIC74.90/1: Environmental consulting activities	30	30	45	45	50
Total Energy Sector <sup>26</sup>	375	460	530	650	705
All Enterprises	66,700	66,650	67,050	69,100	70,725
Energy Sector as a Percentage of All Enterprises	0.6%	0.7%	0.8%	0.9%	1.0%

Source: Inter-Departmental Business Register, ONS<sup>27</sup>

Table 2.3 above shows that the energy sector accounted for 1% of all enterprises in 2017. The proportion has grown each year, from 0.6% in 2013 to 1.0% in 2017. Indeed, over the period 2013-2017 the average annual increase in the number of energy sector enterprises was 17.2% whilst the average annual increase for all enterprises in Northern Ireland was 1.5%.

It is also possible to look at changes in the number of energy enterprises for other regions as a comparison. This is shown in Table 2.4 below.

<sup>24</sup> Figures have been rounded to the nearest 5. \* Counts under 5 have been suppressed.

<sup>25</sup> It is not yet possible to routinely and systematically estimate the number of enterprises operating in the renewable energy industry. The figures above will capture some of these enterprises but it is only an approximation, given the lack of any agreed or clearly defined 'renewables' classification using SIC.

<sup>26</sup> Based on SIC definition using the following SIC codes: 05, 06, 09, 19, 20.14, 35, 36, 38.22, 71.12/2 and 74.90/1.

<sup>27</sup> Data extracted from NOMIS (<https://www.nomisweb.co.uk/>) in May 2018.

Table 2.4 Number of Energy Sector Enterprises and All Enterprises by country, 2013 and 2017

Country	Enterprises in Energy Sector <sup>28</sup>				All enterprises				Energy sector as % of All	
	2013	2017	Change	% Change	2013	2017	Change	% Change	2013	2017
England	14,530	20,610	6,080	42%	1,862,090	2,320,895	458,805	25%	0.8%	0.9%
Scotland	3,025	3,860	835	28%	151,115	174,630	23,515	16%	2.0%	2.2%
Wales	705	985	280	40%	87,690	102,575	14,885	17%	0.8%	1.0%
<b>Northern Ireland</b>	<b>375</b>	<b>705</b>	<b>330</b>	<b>88%</b>	<b>66,700</b>	<b>70,725</b>	<b>4,025</b>	<b>6%</b>	<b>0.6%</b>	<b>1.0%</b>
United Kingdom	18,635	26,170	7,535	40%	2,167,580	2,668,810	501,230	23%	0.9%	1.0%

Source: Inter-Departmental Business Register, ONS<sup>29</sup>

The table above shows that Northern Ireland had the largest percentage increase in the number of energy sector enterprises over the period 2013 to 2017 (an increase of 88%). Indeed, this was more than double the proportional increase of any other country.

Whilst all countries showed a higher percentage increase in the number of energy sector enterprises compared to the percentage rise in the number of all enterprises, the difference was greatest for Northern Ireland (88% compared to 6%). In the UK, the number of energy sector enterprises increased by 40% compared to a 23% rise for all enterprises.

The last two columns in the table show the number of energy sector enterprises as a percentage of all enterprises for 2013 and 2017 respectively. Whilst Northern Ireland lagged behind the UK average and other UK countries in 2013 (NI was lowest at 0.6% in 2013), by 2017 energy sector enterprises as a proportion of all enterprises was the same as the UK average at 1.0%, equivalent to Wales (1.0%) and slightly higher than England (0.9%). Scotland has by far the highest proportion with some 2.2% of all enterprises there in the energy sector in 2017.

<sup>28</sup> Based on SIC definition using the following SIC codes: 05, 06, 09, 19, 20.14, 35, 36, 38.22, 71.12/2 and 74.90/1.

<sup>29</sup> Data extracted from NOMIS (<https://www.nomisweb.co.uk/>) in May 2018.

## Energy Employment

In 2015, the energy sector in Northern Ireland employed over 2,650 people. This is equivalent to less than 1 per cent of the number of energy sector jobs in Great Britain (GB)<sup>30</sup>.

Table 2.5 Employee Jobs in the Energy Sector<sup>31</sup>, Northern Ireland 2013 and 2015, GB 2015

	2013 NI	2015 NI	2015 GB
SIC 05: Mining of coal and lignite	*	*	2,000
SIC 06: Extraction of crude petroleum and natural gas	*	*	15,700
SIC 09: Mining support service activities	*	*	22,900
SIC 19: Manufacture of coke and refined petroleum products	*	*	8,400
SIC 20.14: Manufacture of other organic based chemicals	*	*	9,400
SIC 35: Electricity, gas, steam and air conditioning supply	1,696	1,843	125,100
SIC 36: Water collection, treatment and supply	*	*	33,500
SIC 38.22: Treatment and disposal of hazardous waste	*	0	7,300
SIC 71.12/2: Engineering related scientific and technical consulting activities	501	732	77,000
SIC 74.90/1 Environmental consulting activities	34	79	9,800
Total Energy Sector <sup>32</sup>	2,231	2,654	311,100
All Employee Jobs	691,501	717,105	29,547,600
Energy Sector as Percentage of All Jobs <sup>33</sup>	0.32%	0.37%	1.05% (0.72%)

Sources: Business Register and Employment Survey: NISRA<sup>34</sup>; Office for National Statistics<sup>35</sup>

The table above shows that in GB, just over 1% of all employee jobs in 2015 were in the energy sector. In Northern Ireland 0.37% of all employee jobs in 2015 were in the energy sector. However, given employee jobs data is not available for all SICs for Northern Ireland, a more direct comparison would be to compare the sectors for which employee jobs data is available in Northern Ireland against the same sectors for GB<sup>36</sup>. This gives a comparable GB figure of 0.72%, which is about twice the proportion than for Northern Ireland.

It is worth noting that there was a 19% rise in the number of energy sector jobs in Northern Ireland between 2013 and 2015 whilst overall employee jobs in Northern Ireland increased by less than 4% over the same period. In comparison, there was a 14% rise in the number of energy sector jobs in GB between 2013 and 2015.

<sup>30</sup> Great Britain, rather than the UK, is used as a comparator here as data for some individual SICs are not available at UK level due to such SICs being unavailable/disclosive at the Northern Ireland level.

<sup>31</sup> Based on SIC definition using the following SIC codes: 05, 06, 09, 19, 20.14, 35, 36, 38.22, 71.12/2 and 74.90/1.

<sup>32</sup> This is the sum of jobs for those sectors for which data is available and therefore is an approximation as data for some SICs in the Energy Sector are not available due to disclosure rules.

<sup>33</sup> This is an approximation as data for some SICs in the Energy Sector are not available due to disclosure rules.

<sup>34</sup> See <https://www.nisra.gov.uk/publications/bres-publications-and-tables-2015> for full tables.

<sup>35</sup> From Table 2 of the UK Business Register Employment Survey by ONS – click [here](#) for full tables. GB data is rounded to the nearest hundred.

<sup>36</sup> That is SICs 35, 71.12/2 and 74.90/1.

## Gross Value Added

Table 2.6 below shows the available data for economic output of the energy industry<sup>37</sup>, as measured by the most recent Gross Value Added (GVA) statistics from the Northern Ireland Annual Business Inquiry (NIABI) as well as data from the Annual Business Survey (ABS) for the UK published by the Office for National Statistics (ONS) for comparison purposes.

In short, GVA measures the contribution to the economy of each individual producer, industry or sector. GVA at basic prices, as published in the NIABI and ABS, represents the income generated by businesses, out of which is paid wages and salaries, the cost of capital investment and financial charges before arriving at a figure for profit. It includes taxes on production (e.g. business rates), net of subsidies but excludes subsidies and taxes on products (e.g. VAT and excise duty).

Table 2.6 Gross Value Added (£millions) in the Energy Sector, Northern Ireland 2013-2016, UK 2016

	2013 NI	2014 NI	2015 NI	2016 NI	2016 UK
SIC 05: Mining of coal and lignite			*		*
SIC 06: Extraction of crude petroleum and natural gas				*	8,128
SIC 09: Mining support service activities		*	*	*	1,317
SIC 19: Manufacture of coke and refined petroleum products		*	*	*	2,293
SIC 20.14: Manufacture of other organic based chemicals		*	*	*	854
SIC 35: Electricity, gas, steam and air conditioning supply	447	313	306	392	26,570
SIC 36: Water collection, treatment and supply		*	*	*	9,421
SIC 38.22: Treatment and disposal of hazardous waste		*			243
SIC 71.12/2: Engineering related scientific and technical consulting activities	21	35	38	35	6,141
SIC 74.90/1 Environmental consulting activities		*	*	*	980
All Sectors GVA <sup>38</sup>	19,291	19,736	20,432	21,540	1,201,104
Energy Sector GVA as Percentage of All Sectors GVA	2.4%	1.8%	1.7%	2.0%	4.7% (2.7%)

Source: Northern Ireland Annual Business Inquiry, NISRA; Annual Business Survey, ONS

Due to the small size (i.e. very few or no businesses) or structure (i.e. a small number of large dominant businesses) in some of the sectors in the energy industry definition used here, GVA information is limited<sup>39</sup>. Indeed, as shown above, GVA data is only available for 2 of the 10 SICs covered by the energy

<sup>37</sup> Based on SIC definition using the following SIC codes: 05, 06, 09, 19, 20.14, 35, 36, 38.22, 71.12/2 and 74.90/1.

<sup>38</sup> The NIABI and ABS cover the non-financial business economy. See <https://www.nisra.gov.uk/statistics/annual-business-inquiry/abi-sample-coverage> for more detailed information on the sectors covered by the NIABI.

<sup>39</sup> Information is suppressed, and represented with an asterisk in the table, when there are either a small number of businesses operating in a particular sector or when a business is dominant in a sector and thus publication of results would risk identifying an individual enterprise. Note that 2016 ABI data in all tables are provisional and subject to revision.

industry definition used. However, Table 2.3 earlier showed that 580 of the 650 energy enterprises in 2016 were in SIC 35 or SIC 71122, so the GVA information above, whilst limited, covers about 90% of all enterprises in the energy sector.

Table 2.6 above shows that GVA changed little over the period 2014 to 2016 in SIC 71122 (there was, though, a significant increase between 2013 and 2014). There was a noticeable drop in GVA in the ‘electricity, gas, steam and air conditioning supply’ sector between 2013 and 2014 (a fall of 30%), there was little change between 2014 and 2015 but GVA then increased significantly (by 28% to £392 million) between 2015 and 2016 though this was still 12% below the 2013 figure (£447 million).

Similar to the employment figures shown earlier, it is difficult to express the energy sector as a proportion of all Northern Ireland activity due to data for many of the energy sector SICs being suppressed. However, the table above shows that GVA in the energy sector accounts for around 2% of total GVA in each of the years shown.

Table 2.6 also shows comparative data for the UK. At the UK level there are fewer issues over suppression with only one of the ten SIC groups included in the energy sector definition not available. The table shows that Energy Sector GVA accounted for 4.7% of All Sectors GVA for the UK in 2016, about two and a half times the NI figure for the same year. However, given GVA data is not available for all SICs for Northern Ireland, a more direct comparison would be to compare the sectors for which GVA data is available in NI against the same sectors for the UK<sup>40</sup>. This gives a comparable UK figure of 2.7%, which is about a third higher than the Northern Ireland proportion of 2.0%.

### GVA per head

The data so far has shown that the energy sector accounts for about 1.0% of all enterprises, around 0.4% of all jobs but some 2% of total NI GVA. This suggests that there must be a higher than average GVA per head in this sector compared to the average for all sectors and Table 2.7 below presents this data.

Table 2.7 Gross Value Added per head in the Energy Sector, Northern Ireland 2013-2016, UK 2016

	2013 NI	2014 NI	2015 NI	2016 NI	2016 UK
SIC 35: Electricity, gas, steam and air conditioning supply	£293,653	£192,781	£163,046	£190,858	£193,942
SIC 71.12/2: Engineering related scientific and technical consulting activities	£35,032	£36,247	£47,000	£33,910	£75,815
All Sectors <sup>41</sup>	£36,649	£36,586	£36,789	£38,296	£49,553

Source: Northern Ireland Annual Business Inquiry, NISRA; Annual Business Survey, ONS

Whilst GVA per head in SIC 71122 was around the average for all sectors over the period shown, GVA per head in SIC 35 was much higher (around 8 times higher than the ‘all sectors’ average in 2013 and 5 times higher between 2014 and 2016). Indeed, GVA per head in Northern Ireland for SIC 35 in 2016

<sup>40</sup> That is SICs 35 and 71.12/2.

<sup>41</sup> See [here](#) for information on the sectors covered by the NIABI.



was only slightly below the equivalent GVA per head figure for SIC 35 for the UK as a whole, whereas the GVA per head figure for All Sectors in Northern Ireland was some 23% lower than for the UK.

## Turnover

Information on turnover is also available and this is presented below.

Table 2.8 Turnover (£millions) in the Energy Sector, Northern Ireland 2010-2013, UK 2013

	2013 NI	2014 NI	2015 NI	2016 NI	2016 UK
SIC 05: Mining of coal and lignite			*		*
SIC 06: Extraction of crude petroleum and natural gas				*	18,370
SIC 09: Mining support service activities		*	*	*	5,343
SIC 19: Manufacture of coke and refined petroleum products		*	*	*	22,316
SIC 20.14: Manufacture of other organic based chemicals		*	*	*	3,145
SIC 35: Electricity, gas, steam and air conditioning supply	2,237	2,054	1,917	1,915	109,351
SIC 36: Water collection, treatment and supply		*	*	*	12,578
SIC 38.22: Treatment and disposal of hazardous waste		*			627
SIC 71.12/2: Engineering related scientific and technical consulting activities	36	58	63	55	16,166
SIC 74.90/1 Environmental consulting activities		*	*	*	1,242
All Sectors Turnover <sup>42</sup>	64,514	66,242	67,085	68,881	3,483,825
Energy Sector Turnover as Percentage of All Sectors Turnover	3.5%	3.2%	3.0%	2.9%	5.4% (3.6%)

Source: Northern Ireland Annual Business Inquiry, NISRA; Annual Business Survey, ONS

Like the GVA data presented previously, turnover information for Northern Ireland is only available for 2 of the 10 SICs covered by the energy industry definition used. This shows that these two SICs accounted for 2.9% of total turnover in 2016. In the UK as a whole, the same two SICs accounted for 3.6% of turnover. Data for 9 of the 10 SICs is available for the UK and this showed that 5.4% of All Sectors Turnover in the UK was from these sectors.

Turnover has decreased each year in the Electricity, gas, steam and air conditioning supply sector in NI over the period shown. Between 2013 and 2014 turnover fell by 8%, it fell another 7% between 2014 and 2015 and then showed a slight fall between 2015 and 2016. The fall in turnover in SIC 35 over the period caused similar falls in energy sector turnover as a proportion of all sectors turnover, from 3.5% in 2013 to 2.9% in 2016.

<sup>42</sup> The NIABI and ABS cover the non-financial business economy. See [here](#) for more information

## Annex 2.1 Low Carbon and Renewable Energy Economy (LCRE) Scope

The LCRE collected business activity in each of the following Low Carbon and Renewable Energy sectors.

Sector	Description
Offshore wind	The production of electricity from Offshore wind renewable sources and the design, production, and installation of infrastructure for this purpose. Including operations and maintenance.
Onshore wind	The production of electricity from Onshore wind renewable sources and the design, production, and installation of infrastructure for this purpose. Including operations and maintenance.
Solar photovoltaic	The production of electricity from Solar renewable sources and the design, production, and installation of infrastructure for this purpose. Including operations and maintenance.
Hydropower	The production of electricity from Hydropower renewable sources and the design, production, and installation of infrastructure for this purpose. Including operations and maintenance.
Other renewable electricity	The production of electricity from wave and/or tidal and/or geothermal renewable sources and the design, production, and installation of infrastructure for this purpose. Including operations and maintenance.
Bioenergy	The production of energy (electricity and heat) from renewable bioenergy sources and the design, production, and installation of infrastructure for this purpose. Including operations and maintenance. Bioenergy is liquid biofuels, solid biomass and biogas e.g. biomethane, vegetable oil, peanut oil and energy crops. This sector includes gasification and anaerobic digestion.
Alternative Fuels	The production of fuels for low carbon and renewable energy use which is not classified as bioenergy. Including hydrogen. Excluding compressed natural gas and LPG.
Renewable heat	The design, production, and installation of infrastructure for generating heat directly through solar, thermal, geothermal or other means. Including operations and maintenance. Including Ground source and Air source heat pumps. Excluding generating electricity which is then used to generate heat. Excluding heat from biomass which is classified under Bioenergy.
Renewable combined heat and power	The design, production, and installation of infrastructure for generating heat directly through solar, thermal, geothermal or other means where the renewable sources both generate direct heat and electricity. Including operations and maintenance. Excluding heat and power from biomass which is classified under Bioenergy.
Energy efficient lighting	The design, manufacture and installation of energy efficient bulbs, tubes, fittings etc designed for the purpose of using less energy to produce the same or greater amount of light.
Energy efficient products	The design, manufacture and installation of energy efficient products. Examples include: <ul style="list-style-type: none"> <li>-Energy efficient doors and windows</li> <li>-Heating and ventilation, such as condensing boilers, ventilation and heating recovery</li> <li>-Insulation such as loft, external wall, roof insulation</li> <li>-Reducing energy consumption for heat or air conditioning by minimising 'leakage' of heat</li> <li>-Energy efficient building materials or technologies</li> </ul>

	<ul style="list-style-type: none"> <li>-Sustainable buildings and architecture</li> <li>-Either materials with greater insulation properties or durability properties or those requiring significantly less carbon emission in their manufacture or recycling waste materials in their manufacture</li> </ul> <p>Exclude: 'Smart' goods such as TVs and freezers.</p>
Energy monitoring, saving or control systems	<p>The design, manufacture and installation of systems that reduce energy consumption through effective heat or energy management. Include equipment and related systems for doing this. Examples include:</p> <ul style="list-style-type: none"> <li>-Smart heating controls</li> <li>-Energy management systems</li> <li>-Condensation control</li> <li>-Energy management software</li> <li>-Control system components</li> </ul>
Low carbon financial and advisory services	<p>Expert advice and education on: reducing carbon consumption, engaging in low carbon industrial activities, carbon credits and funding systems for low carbon activities and services.</p> <p>Include: environmental and/or energy consultants</p>
Low emission vehicles and infrastructure	<p>Design and manufacture of vehicles with specific technology to significantly reduce or remove emissions.</p> <p>Include: hybrid vehicles, electric vehicles, fuel cell vehicles or other technologies.</p> <p>Exclude: small efficiency improvements such as lighter bodywork or aerodynamics. Fuel efficient, conventional vehicles are also excluded.</p>
Carbon capture and storage	<p>Capturing waste CO<sub>2</sub> at point of emission and depositing it where it will not enter the atmosphere. Activity of doing this and the design, manufacture and installation of infrastructure for this purpose.</p>
Nuclear power	<p>The production of electricity from nuclear power and the design, production and installation of infrastructure for this purpose. Including operations and maintenance. Decommissioning and waste processing activities are excluded.</p>
Fuel cells and energy storage systems	<p>The design, manufacture and installation of energy storage systems, flywheel energy storage, fuel cells, batteries and any other form of energy storage system.</p>

These sectors can be aggregated into the following groups:

Group	Description
Low Carbon Electricity	Offshore wind, Onshore wind, Solar Photovoltaic, Hydropower, Other renewable electricity, Nuclear power, Carbon capture and storage
Low Carbon Heat	Renewable heat, Renewable combined heat and power
Energy from Waste and Biomass	Bioenergy, Alternative fuels
Energy Efficient Products	Energy efficient products, Energy efficient lighting, Energy monitoring, saving or control systems
Low Carbon Services	Low carbon financial and advisory services
Low Emission Vehicles and Infrastructure*	Low emission vehicles and infrastructure
Fuel Cells and Energy Storage*	Fuel cells and energy storage systems

\*Please note that due to statistical disclosure control, the Fuel Cells and Energy Storage and Low Emission Vehicles and Infrastructure sectors have been combined in published estimates. This combined group has been labelled the 'Low Emission Vehicles' group.

## Annex 2.2 Notes to Table 2.1

Figures in Table 2.1 may not sum due to rounding.

The Coefficient of Variation (CV) for turnover and employment by region are shown in the table below. Note that Table 2.1 shows the annual average for turnover and employment over a three year period whilst the CVs in the table below show the CV values for each of the three years 2014 to 2016.

Country	Coefficient of Variation (CV) Range					
	Turnover (£'000)			Employees (FTE)		
	2014	2015	2016	2014	2015	2016
UK	CV <10%	CV <10%	CV <10%	CV <10%	CV <10%	CV <10%
England	CV <10%	CV <10%	CV <10%	CV <10%	CV <10%	CV <10%
Scotland	CV <10%	CV <10%	CV <10%	CV <10%	CV >=10% and <20%	CV >=10% and <20%
Wales	CV <10%	CV <10%	CV >=10% and <20%	CV >=10% and <20%	CV >=10% and <20%	CV >=20% and <30%
Northern Ireland	CV <10%	CV <10%	CV <10%	CV >=10% and <20%	CV <10%	CV >=10% and <20%

Source: Office for National Statistics

The Coefficient of Variation (CV) is the ratio of the standard error of an estimate to the estimate itself. For example, an estimate with a CV of 5% will have a standard error that is 5% of the estimate. The smaller the coefficient of variation the greater the accuracy of the estimate. A rough guide to CVs is: less than 10% is very good, 10% is good and 20% is acceptable. CVs that are greater or equal to 20% should be used with caution.

### Annex 2.3 Notes to Table 2.2

Figures in Table 2.2 may not sum due to rounding.

The estimated Coefficient of Variation (CV) for the figures in Table 2.2 are shown in the table below.

	Coefficient of Variation (CV) Range	
	Turnover (£'000)	Employees (FTE)
Low Carbon Electricity	CV =>20% and <30%	CV =>20% and <30%
Low Carbon Heat	CV =>20% and <30%	CV =>30% and <40%
Energy from Waste & Biomass	N/A	CV =>30% and <40%
Energy Efficient Products	CV =>10% and <20%	CV >=10% and <20%
Low Carbon Services	CV >40%	CV >40%
Low Emission Vehicles & Infrastructure; Fuel Cells & Energy Storage	N/A	CV <10%

Source: Office for National Statistics

The Coefficient of Variation (CV) is the ratio of the standard error of an estimate to the estimate itself. For example, an estimate with a CV of 5% will have a standard error that is 5% of the estimate. The smaller the coefficient of variation the greater the accuracy of the estimate. A rough guide to CVs is: less than 10% is very good, 10% is good and 20% is acceptable. CVs that are greater or equal to 20% should be used with caution.

## Chapter 3: Electricity

### Summary of key points

- At June 2018, Northern Ireland had three major fossil-fuel based electricity generating plants and a number of renewable generators which make up indigenous electricity production. Interconnection with the Republic of Ireland and Scotland help to maintain security of supply.
- As expected, electricity consumption peaks during the winter months and is at its lowest during the summer months. Monthly consumption in Northern Ireland peaked in December 2010 (at about 837 GWh) and the lowest levels recorded were in July 2016 and July 2017 at around 574 GWh (and over 31% below peak monthly consumption).
- In general, there has been a slight downwards trend in annual electricity consumption in Northern Ireland over the period 2010-2017 with total consumption in 2017 (7,783 GWh) some 7.7% lower than in 2010.
- Average annual domestic electricity consumption per meter ranges from 3,100 kWh in Belfast to 4,100 kWh in Mid Ulster District Council area, meaning consumption per meter in this council area is around 32% higher than Belfast and some 14% above the Northern Ireland average.
- Whilst some 93% of all meters are in domestic properties, the domestic sector accounts for only 36.5% of total electricity consumption.
- In each year 2004-2013, Northern Ireland was a net exporter in terms of electricity trades with the Republic of Ireland (via the North-South tie-lines). However since 2014, Northern Ireland has imported more electricity from the Republic of Ireland than it exported (although such imports and exports totals are relatively small accounting for only a small proportion of overall consumption of electricity).
- Northern Ireland was a net importer of electricity from Scotland (via the Moyle interconnector) in every year from 2002-2015 and transfers were significant in some years. Between 2009 and 2013 around one quarter of all electricity consumed in Northern Ireland was via transfers from Scotland. However, in 2016 and for the first time, Northern Ireland was a net exporter of electricity to Scotland (although the net difference was small at 252 GWh).

## Introduction

The electricity system in Northern Ireland consists of the following distinct businesses: generation, transmission, distribution and supply. A diagram highlighting the structure and main participants in the electricity market at the end of 2017 in Northern Ireland is shown below.

Figure 3.1 Structure and main participants of the Northern Ireland Electricity Market



## Generation

There are three major power generating sites in Northern Ireland as follows<sup>43</sup>:

- Ballylumford (gas fuelled<sup>44</sup>) is located at the tip of the Islandmagee peninsula, is owned by AES and is Northern Ireland's largest power station with an installed capacity of around 1,300 MW.
- Coolkeeragh (gas fuelled<sup>45</sup>) is located in Londonderry, is owned by ESB and has an installed capacity of some 460 MW.
- Kilroot (mainly coal and oil fuelled<sup>46</sup>) is located in Carrickfergus and is owned by AES and has an installed capacity of some 660 MW.

<sup>43</sup> The capacities for each power station are taken from Table 5.11 of the [Digest of United Kingdom Energy Statistics 2017](#). Please note that installed capacities are subject to change from year to year.

<sup>44</sup> Ballylumford generates electricity via a combination of Combined Cycle Gas Turbines (CCGT), gas and gas oil. CCGT are a form of highly efficient energy generation technology that combines a gas-fired turbine with a steam turbine.

<sup>45</sup> Coolkeeragh is mainly a CCGT plant (about 400MW) with a further 50MW of OCGT (Open Cycle Gas Turbine) capacity.

<sup>46</sup> Kilroot station generates 520 MW of electricity from dual coal and oil fuelled generators, along with approximately 140 MW from four Gas Turbines.

In addition to the major gas and coal/oil fuelled power stations, Northern Ireland also has renewable energy sources (capacity of over 1,200 MW<sup>47</sup>, mostly from wind). Northern Ireland also has interconnection with the Scottish grid, with two 250 MW lines on the Moyle Interconnector. Interconnection with the Republic of Ireland grid is via three tie-lines with a combined 600MW capacity. Electricity can be imported and exported via the Moyle Interconnector and North-South tie-lines.

### **Transmission**

Transmission normally refers to the bulk transfer of electrical energy from large electricity generators to electrical substations. Transmission lines carry electricity at a very high voltage. Ownership of the transmission system lies with Northern Ireland Electricity Networks Ltd (NIE Networks), which is a subsidiary of the ESB Group, and they are responsible for transmission construction and maintenance. The transmission network is operated by the System Operator for Northern Ireland (SONI). A map of the transmission system in Northern Ireland is shown in Annex 3.1.

### **Distribution**

The local wiring between high-voltage substations and customers is typically referred to as electric power distribution. The conversion of high voltage into a voltage that can be used by customers is done through transformers and distribution lines then carry electricity at lower voltage levels to houses and businesses<sup>48</sup>. In Northern Ireland, NIE Networks operates the distribution network which transports electricity to over 870,000 customers<sup>49</sup> in the domestic and non-domestic sectors.

### **Supply**

From November 2007 and the opening of the Single Electricity Market (SEM), electricity retail supply was fully open to competition, though there were no competing suppliers in the domestic market until 2010. Electricity suppliers buy energy and sell it to customers. Business and domestic consumers in Northern Ireland can choose between a number of private sector electricity suppliers to meet their individual electricity requirements.

### **Wholesale Electricity Markets<sup>50</sup>**

A wholesale electricity market is where generators and suppliers meet to trade electricity that is then sold onto household and business consumers. Importantly, the wholesale market involves the trading of electricity for resale – it is not directly sold to the final consumer. This is distinct from the retail market where suppliers are responsible for the selling, metering, billing and collection of payments to customers. To make sure that wholesale electricity markets work well and fairly, arrangements are needed to cover market decision-making and day-to-day operations.

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<sup>47</sup> As at end December 2017, figures provided by SONI.

<sup>48</sup> Maps of the 11kV and 33kV distribution network in Northern Ireland are available [here](#)

<sup>49</sup> At end December 2017 as per Utility Regulator's Quarterly Transparency report for Q4 2015 (see page 6 of report [here](#)).

<sup>50</sup> Information on Wholesale Markets, SEM and I-SEM taken mainly from the SEM Committee's 'Quick Guide to the I-SEM' – available [here](#)



## **The Single Electricity Market (SEM)**

The current wholesale electricity market is called the Single Electricity Market (SEM), the wholesale market on the island of Ireland, which was set up in 2007. It combined what were two separate markets, for the Republic of Ireland and Northern Ireland, into one all-island wholesale electricity market. The SEM is a central pool through which generators and suppliers trade electricity on the island of Ireland.

The operation of this single wholesale market requires the physical connection of the Northern Ireland grid to that in the Republic. The Northern Ireland and Republic of Ireland transmission systems are connected via a double circuit 275 kV line between Tandragee and Louth. In addition there are two 110kV connections between Strabane and Letterkenny and Enniskillen and Corraclassy. The existing connections are proposed to be enhanced by a new 400Kv North-South transmission connection (Tyrone-Cavan Interconnector) which should allow for cheaper electricity generation and improve the reliability and security of electricity supply<sup>51</sup>.

The key ways the SEM works are:

- generators submit bids (for capacity and selling price) to the Single Electricity Market Operator (SEMO) to generate electricity for each half-hour of the following day;
- these bids are stacked in order with the least expensive generators called on to provide power until demand is met;
- the bids and demand set the energy price for each half-hour period, called the system marginal price (SMP), and this price is paid to all those generators who are scheduled to produce power – some generators will not be required and so will not receive an energy payment;
- as well as this, generators also receive capacity payments if they are available to generate and also constraints payments if the power delivered by generators is different from that scheduled, due to the technical realities of operating a complex power system.

## **The New Market – The I-SEM**

Much has changed since the SEM was introduced. In particular, there is now more generation from renewable sources across the island. Electricity markets are now undergoing significant changes, partly to take advantage of the opportunities from the coupling of energy markets across Europe and shared ways of trading electricity. Levels of interconnection between member states and regions have never been greater and markets are looking to take advantage of these new linkages.

For these reasons the SEM is being replaced by the I-SEM which is due to go live on 1<sup>st</sup> October 2018<sup>52</sup>. There are several key differences between the SEM and I-SEM market designs as shown in Figure 3.2 below:

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<sup>51</sup> See [http://issuu.com/designtactics/docs/soni\\_north\\_south\\_interconnector\\_-\\_a?e=1919908/34185602](http://issuu.com/designtactics/docs/soni_north_south_interconnector_-_a?e=1919908/34185602)

<sup>52</sup> See <https://www.semcommittee.com/news-centre/i-sem-project-market-update>

Figure 3.2 Key differences between the SEM and I-SEM

	SEM	I-SEM
<b>Market structure</b>	One pool and timeframe	Different markets with different timeframes
<b>Trading opportunities</b>	A single opportunity for generators to submit their bids each day.	Generators and suppliers will have multiple opportunities to trade (at Day Ahead and Intra Day stages – more detail in section 3 below).
<b>Setting the market price</b>	All generator bids stacked up in order of merit, with the last generator (the most expensive) required to meet demand setting the price that suppliers pay. Suppliers are price takers.	Suppliers are price makers – they set limits on what they are willing to pay in each market and, where this crosses with what generators are willing to accept, this sets the market price.
<b>Balancing supply and demand</b>	Supply and demand are matched using an algorithm.	Generators and suppliers have to match their <i>actual</i> with their <i>traded</i> generation and usage. If their generation or usage differs, suppliers or generators are liable for these costs in the balancing market.
	SEM	I-SEM
<b>Capacity payments to generators</b>	The Capacity Payment Mechanism gives capacity payments to cover generators' fixed costs and are paid so long as the generator declares that it is available to run.	Generators are paid only when their output is required to meet demand and only if they can.
<b>Trading across interconnectors with Great Britain</b>	Capacity on interconnectors can be reserved to flow power in line with their trading approach. This may not deliver a cost-efficient flow.	Interconnection capacity allocated based on prices with electricity always flowing from the cheapest to the most expensive market.

Source: SEM Committee<sup>53</sup>

### Benefits of I-SEM<sup>54</sup>

For electricity consumers generally there are three main positive impacts of the I-SEM. Firstly, because the I-SEM facilitates trading across borders and making best use of the power available from all sources on the island of Ireland, this helps security of supply. Secondly, it will be a more competitive market than the SEM. Consumers should therefore benefit from a more competitive process for setting prices, including the use of capacity auctions. Thirdly, our geographical location has meant that electricity prices have tended to be higher in the all-island market than in Great Britain. The better way of allocating power across our interconnector with Great Britain should place a downward pressure on prices because electricity will now flow more efficiently. Additionally, using the interconnectors more efficiently should contribute to the expansion of renewable generation as it should avoid the curtailment of wind generation at times of peak demand.

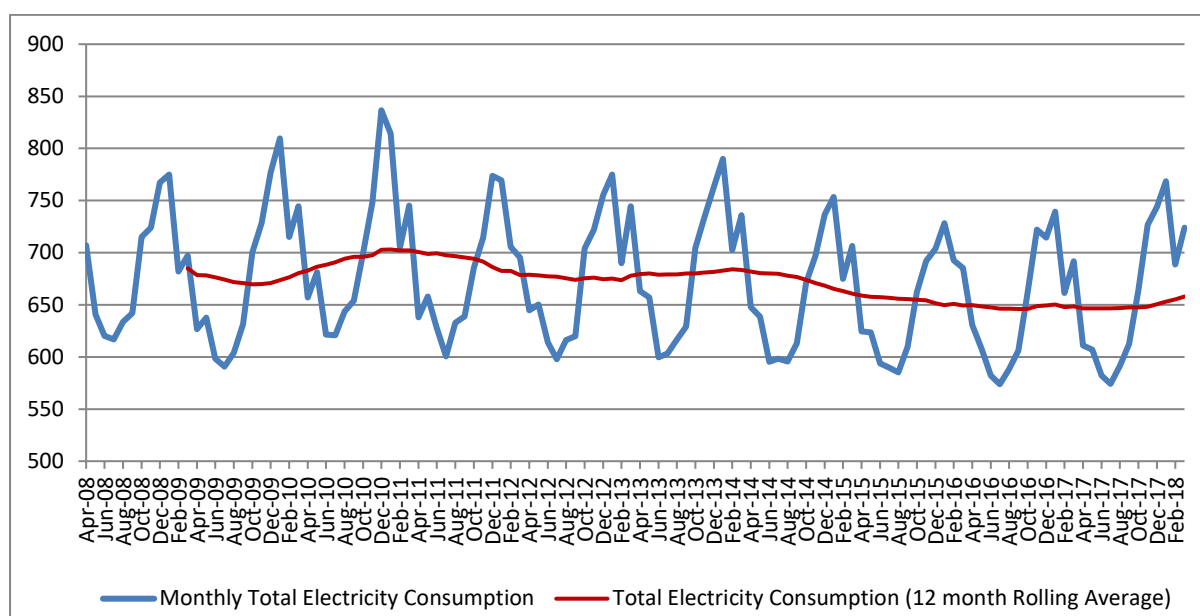
<sup>53</sup> Information taken from page 6 of the SEM Committee's 'Quick Guide to the I-SEM' - link [here](#)

<sup>54</sup> Information taken from page 9 of the SEM Committee's 'Quick Guide to the I-SEM' - link [here](#)

## Electricity Consumption – Monthly

DfE Analytical Services Unit publishes electricity consumption data for Northern Ireland twice a year as part of their Electricity Consumption and Renewable Generation in Northern Ireland publication<sup>55</sup>. The overall electricity consumption data contained in these reports is derived from aggregated meter readings supplied by NIE Networks and therefore is an accurate measure of actual electricity consumption across the domestic and non-domestic sectors. Chart 3.1 below shows total electricity consumption for Northern Ireland for each month over the period April 2008 to March 2018.

Chart 3.1 Monthly Total Electricity Consumption and 12-month Rolling Average Consumption in Northern Ireland (GWh)



Source: NIE Networks

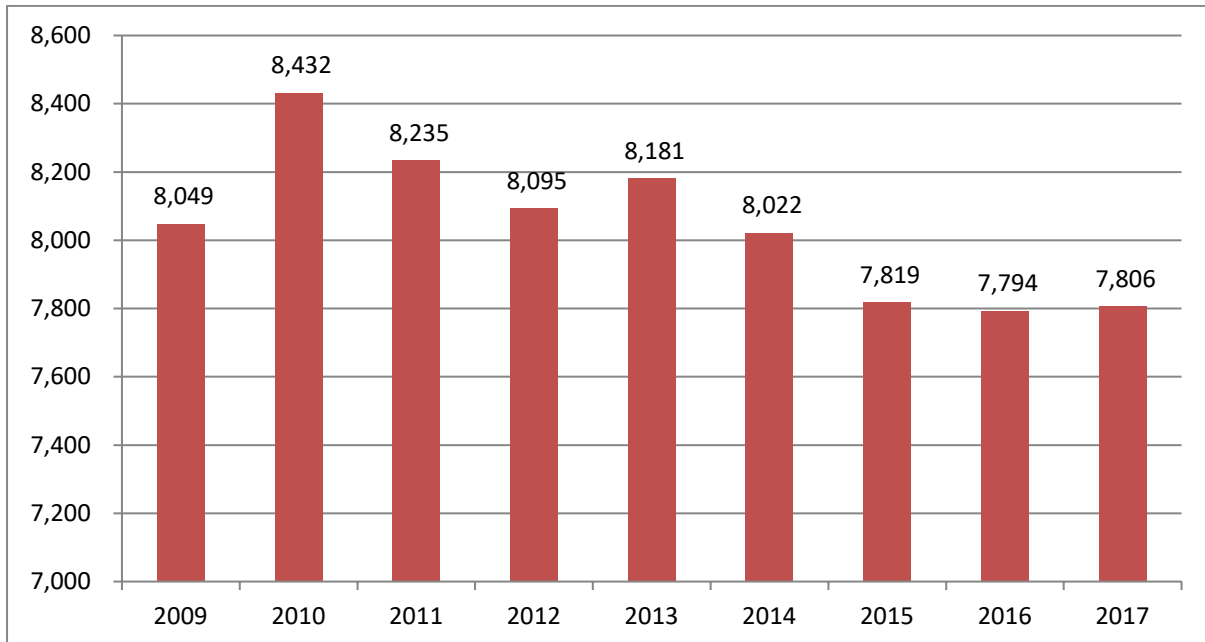
The chart shows that, predictably, electricity consumption peaks during the winter months and is at its lowest during the summer months. The 12 month rolling average line smoothes out short-term fluctuations and highlights longer-term trends in electricity consumption over the period April 2008 to March 2018. This shows an overall downwards trend in electricity consumption over the period, particularly since the start of 2011. The chart also shows that monthly consumption peaked in December 2010 (at about 837 GWh) and the lowest level recorded over the period was in July 2016 (around 574 GWh and 31% below peak monthly consumption).

<sup>55</sup> Click [here](#) for further details of this publication.

## Electricity Consumption - Annual

The chart below shows total annual electricity consumption for Northern Ireland for each year 2009 to 2017.

Chart 3.2 Total Annual Electricity Consumption in Northern Ireland (GWh), 2009 to 2017



Source: NIE Networks

Electricity consumption in 2017 (7,806 GWh) was the second lowest in the nine year period shown (though only around 3% lower compared to 2009). Over the 9 year period, consumption peaked in 2010 (8,432 GWh) but there has been a slight downwards trend over the period 2010-2017 (though there was a slight rise in consumption between 2012 and 2013 and there has been virtually no change over the period 2015-17) with annual consumption in 2017 some 7.4% lower than in 2010.

There are a number of factors which may have contributed to the reduction in consumption over the period 2010-2017, including: weather conditions, energy efficiency improvements (such as increased levels of insulation), the extension of the gas supply network, new boilers and more energy efficient appliances, increases in electricity prices, the recession, changes in the building stock and household composition.

## Sub-national electricity consumption

The Department of Business, Energy and Industrial Strategy (BEIS) have produced some experimental data in relation to domestic<sup>56</sup> and non-domestic<sup>57</sup> electricity consumption at a District Council level (the previous 26 council areas) for Northern Ireland. The latest year available is for 2015-16<sup>58</sup> and results have been aggregated into the new 11 super council areas as shown in Table 3.1 below<sup>59</sup>.

Table 3.1 Experimental Electricity Consumption Statistics at District Council Level (kWh<sup>60</sup>), 2015-16

Council name	Domestic			Non-domestic		
	Total consumption (kWh)	Total number of meters	Average consumption per meter (kWh)	Total consumption (kWh)	Total number of meters	Average consumption per meter (kWh)
Antrim & Newtownabbey	221,122,600	60,900	3,600	365,551,500	3,870	94,500
Ards & North Down	271,748,400	72,710	3,700	230,569,400	4,560	50,600
Armagh City, Banbridge & Craigavon	331,934,100	85,840	3,900	559,745,700	6,940	80,700
Belfast	427,539,900	140,040	3,100	1,013,320,300	12,350	82,100
Causeway Coast & Glens	240,505,500	65,270	3,700	259,431,200	5,270	49,200
Derry City & Strabane	214,728,300	62,290	3,400	430,068,700	5,230	82,200
Fermanagh & Omagh	177,326,800	48,530	3,700	351,781,000	4,800	73,300
Mid & East Antrim	225,969,600	60,650	3,700	350,448,300	4,390	79,800
Mid Ulster	224,570,200	54,220	4,100	456,652,900	5,860	77,900
Newry, Mourne & Down	276,607,500	70,480	3,900	308,050,400	6,310	48,800
Lisburn & Castlereagh	302,736,000	82,710	3,700	359,994,100	5,020	71,700
Unallocated <sup>61</sup>	10,324,700	4,550	2,300	26,042,100	290	89,800
NI Total	2,925,113,800	808,170	3,600	4,705,129,400	64,850	72,600

Source: BEIS

For domestic consumption, data are based on billed units from customers that have been connected for at least 12 months<sup>62</sup> with non-domestic consumption based on billed units (and relate to final consumption at the point when it was derived) and, in both cases, cover the period 1 April 2015 to 31 March 2016. Therefore, the consumption figures will not match exactly with those shown for 2015 in

<sup>56</sup> Link [here](#) to BEIS sub-national domestic electricity consumption data.

<sup>57</sup> Link [here](#) to BEIS sub-national non-domestic electricity consumption data.

<sup>58</sup> This covers the financial year 1 April 2015 to 31 March 2016. As Northern Ireland statistics are experimental, any year-on-year comparisons should be treated with caution.

<sup>59</sup> Data for the old 26 District Council Areas and details of how the data was aggregated into the new council areas is provided in Annex 3.2 for information.

<sup>60</sup> 1 GWh = 1,000,000 kWh

<sup>61</sup> Unallocated consumption is consumption that was not able to be matched to a council area due to incomplete or a lack of postcode information. Such consumption represents less than 1% of total domestic or non-domestic consumption.

<sup>62</sup> As the data that is provided is billed information as opposed to the sales information reported, unbilled units are excluded and both meters and consumption numbers have been uplifted to match annual sales data.

Chart 3.2 earlier (total consumption in Table 3.1 above is some 7,630 GWh compared to total consumption of 7,819 GWh for 2015 as shown in Chart 3.2, a difference of less than 3%).

As the table shows, average domestic consumption per meter in 2015-16 ranged from 3,100 kWh in Belfast to 4,100 kWh in Mid Ulster District Council area, although consumption for most district council areas was close to the NI average of around 3,600 kWh. Domestic consumption per meter in Mid Ulster is some 32% higher than Belfast and 14% above the Northern Ireland average, whilst domestic consumption in Belfast was some 14% below the Northern Ireland average. The lower domestic consumption per meter in Belfast council area may be due factors such as the better availability of mains gas in that council area which may reduce the requirement for electricity for heating etc. or the housing mix in council areas.

Predictably, given the concentration of domestic dwellings and businesses, Belfast City Council area has by far the largest share of both domestic consumption (around 15%) and non-domestic consumption (22%).

Further analysis shows that, since the last Energy in Northern Ireland report (published in 2016 and with data relating to 2013-14), domestic electricity consumption fell in all council areas with the largest percentage falls being in Belfast (-9.3%) and Derry & Strabane (-9.1%) council areas and the lowest fall in Mid Ulster (-3.3%) with the Northern Ireland average decrease at 6.1%.

Similar analysis for the non-domestic sector is mixed with four council areas showing a fall, six showing a rise and one with no change. Most changes were small and, overall, seven of the 11 district council areas showed changes of less than 2% in non-domestic electricity consumption between 2013-14 and 2015-16 and the Northern Ireland average was a 0.4% increase. However, Mid-Ulster did have a rise of 9.3% in non-domestic electricity consumption whilst in Belfast consumption fell 3.2% over the period.

## Domestic versus non-domestic consumption – Northern Ireland

Table 3.1 above also highlights that, while around 93% of all meters in 2015-16 were in domestic properties, the domestic sector accounted for less than two-fifths of total electricity consumption. More up-to-date information<sup>63</sup> from a different source (presented in Table 3.2 below), shows that for the calendar year 2017, a similar split continues to exist between the domestic and non-domestic sectors in terms of connections (91.7% and 8.3% respectively) and consumption (36.6% and 63.4% respectively).

Table 3.2 Connection numbers & consumption by market segment in Northern Ireland, 2016 and 2017<sup>64</sup>

Market Segments	Connection Numbers <sup>65</sup>		Annual Consumption (GWh)	
	At end 2016	At end 2017	2016	2017
<b>Domestic:</b>				
Domestic Credit	449,582	448,401	1,694.0	1,668.1
Domestic Prepayment	344,215	352,101	1,153.4	1,190.8
<b>Total Domestic</b>	<b>793,797</b>	<b>800,502</b>	<b>2,847.4</b>	<b>2,858.9</b>
<b>Non-Domestic (Industrial &amp; Commercial):</b>				
I&C < 20 MWh	47,306	48,468	331.5	339.5
I&C 20 - 49 MWh	13,066	13,029	412.8	412.8
I&C 50 - 499 MWh	9,920	9,884	1,302.8	1,298.6
I&C 500 - 1,999 MWh	830	828	803.7	804.5
I&C 2,000 - 19,999 MWh	267	255	1,358.4	1,337.3
I&C ≥ 20,000 MWh	18	20	737.2	756.1
<b>Total Industrial &amp; Commercial (I&amp;C)</b>	<b>71,407</b>	<b>72,484</b>	<b>4,946.5</b>	<b>4,948.7</b>
<b>Total (Domestic + I&amp;C)</b>	<b>865,204</b>	<b>872,986</b>	<b>7,793.9</b>	<b>7,807.7</b>
<b>% Domestic</b>	<b>92.9%</b>	<b>91.7%</b>	<b>36.5%</b>	<b>36.6%</b>
<b>% Non-domestic</b>	<b>7.1%</b>	<b>8.3%</b>	<b>63.5%</b>	<b>63.4%</b>

Source: Northern Ireland Utility Regulator, Quarterly Transparency Reports

Moreover, this more recent data shows that the largest industrial and commercial (I&C) users consume a disproportionate amount of electricity. Those I&C customers consuming more than 2,000 MWh accounted for less than 0.4% of all I&C connections but were responsible for more than two fifths (42.3%) of non-domestic consumption in 2017. Indeed, a very small number of the largest energy users (i.e. those 20 customers at the end of 2017 who were consuming more than 20,000 MWh) were responsible for over 15% of I&C consumption and almost one tenth of the total volume of electricity consumption (both domestic and non-domestic) in Northern Ireland in 2017.

<sup>63</sup> See Utility Regulator's Transparency Reports [here](#).

<sup>64</sup> Data for 2016 taken from 2016 Annual Transparency Report and data for 2017 calculated from four Quarterly Transparency Reports for 2017.

<sup>65</sup> Long term vacant sites are not included in connection numbers and combined premises are included in the <20MWh category.

In the domestic sector, there was an increase of around 6,700 customers between 2016 and 2017 although this was made up of a 2.3% rise in prepayment customers (+7,900) and a 0.3% fall in credit customers (-1,200). Overall, domestic customers consumed on average about 3.6 MWh of electricity in 2017 (an average of 3.7 MWh for credit customers and an average of 3.4 MWh for prepayment customers).

In the non-domestic sector some 85% of customers consume less than 50 MWh per annum and over 98% consume less than 500 MWh per annum. There was an increase of 1,162 customers between 2016 and 2017 in the non-domestic sector with virtually all of this rise due to increases in the non-domestic group consuming the lowest amount of electricity (i.e. the <20 MWh group). Indeed, 5 of the other 6 non-domestic groups saw slight falls in customer numbers over the period.

### **Domestic versus non-domestic consumption - Regional comparisons**

Similar information for Great Britain and its regions is published by BEIS<sup>66</sup>. As shown in Chart 3.3 below, the split between domestic and non-domestic electricity consumption for GB as a whole is very similar to that for Northern Ireland. In 2016, 38% of electricity in GB was estimated to be consumed in the domestic sector and 62% by the non-domestic sector (with 92% of meters in the domestic sector and 8% in the non-domestic sector for GB).

However, as shown in the chart, the split varies across the regions of Great Britain. Domestic consumption accounted for only 24% of total electricity consumption in Inner London but was almost twice this proportion in Outer London (46%) and 42% or more in four other regions (East England, Scotland, South East and South West). Indeed, the variation is even more marked across GB local authorities (equivalent to NI council areas). For example domestic consumption makes up less than 20% of total electricity consumption in five local authorities (City of London, Neath Port Talbot, Westminster, Tower Hamlets and Slough) and as much as 70% in one local authority (East Renfrewshire)<sup>67</sup>. The distribution depends on local factors, such as the type of industry/service, the mix of properties and the extent to which electricity is used for heating.

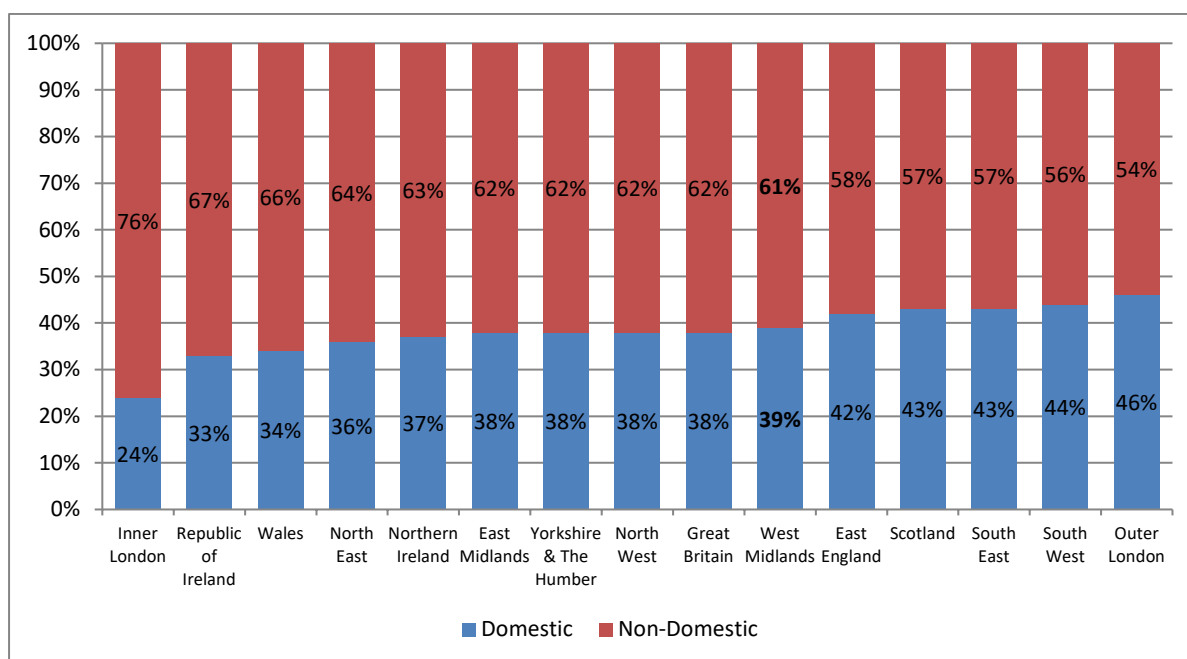
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<sup>66</sup> Full publication can be accessed [here](#)

<sup>67</sup> From page 10 of BEIS publication, available [here](#)



Chart 3.3 Distribution of domestic/non-domestic electricity consumption by country & region, 2016



Sources: BEIS; Utility Regulator; ESB Networks and Eirgrid

In addition, data provided by ESB Networks and Eirgrid shows a slightly different domestic/non-domestic split for the Republic of Ireland, with a higher proportion of electricity consumed in the Republic of Ireland (67%) for non-domestic purposes compared to Northern Ireland (63%). In 2016, domestic electricity sales in the Republic of Ireland were 8,400 GWh (accounting for 33% of all electricity sales) and non-domestic sales were 16,961 GWh which was 67% of all electricity sales in the Republic of Ireland<sup>68</sup>.

### Electricity Flowchart

The flowchart overleaf (Chart 3.4) produced by BEIS<sup>69</sup> shows the relationship between generation and consumption of electricity in each of the UK countries by means of a flow diagram. Further details on generation and supply totals for the UK and its regions can be found in Annex 3.3.

The flowchart shows that, for Northern Ireland, indigenous generators produced 9,182 GWh of electricity in 2016. Of this, 281 GWh was for their own use resulting in 8,901 GWh net electricity supplied by indigenous generators to the public supply system. Net exports to Scotland were 252 GWh, although a similar amount (199 GWh) was imported (net) from the Republic of Ireland, so adding these to indigenous generation means a total of 8,848 GWh of electricity supplied. However, 687 GWh of this was taken up through transmission and distribution losses<sup>70</sup> which leaves a total of 8,161 GWh

<sup>68</sup> Data for 2016 is provisional.

<sup>69</sup> See [here](#) for full publication.

<sup>70</sup> In general, losses are estimated from the discrepancy between power produced (as reported by power plants) and power sold to the end customers; the difference between what is produced and what is consumed constitute transmission and distribution losses. In this case, estimates of losses for each country have been made by BEIS using UK proportions. An estimate of losses due to theft has also been included along with the distribution losses estimate.

of total consumption. Of this total consumption, 914 GWh was consumption by autogenerators<sup>71</sup> (see Annex 3.3 for more details) meaning 7,247 GWh was the derived figure for electricity 'consumption from public supply'<sup>72</sup> for Northern Ireland.

The flowchart (and table in Annex 3.3) highlights the fact that England was reliant on imports of electricity to meet demand in 2016. However, Scotland, Wales and Northern Ireland are net exporters of electricity, with Wales and Scotland in particular exporting a significant amount of the electricity they generate. In 2016, Wales exported almost half (48.4%) of its indigenous electricity generation to England (18,419 GWh). Northern Ireland had net exports of 252 GWh to Scotland but net imports of 199 GWh from the Republic of Ireland making Northern Ireland a small net exporter overall.

Wales started trading with the Republic of Ireland in 2012 and was a net exporter to them each year, with some 5,634 GWh (net) of electricity exported to the Republic of Ireland in the three year period 2013-2015. However, in 2016 Wales received more imports of electricity from the Republic of Ireland than it exported resulting in net imports of 313 GWh of electricity.

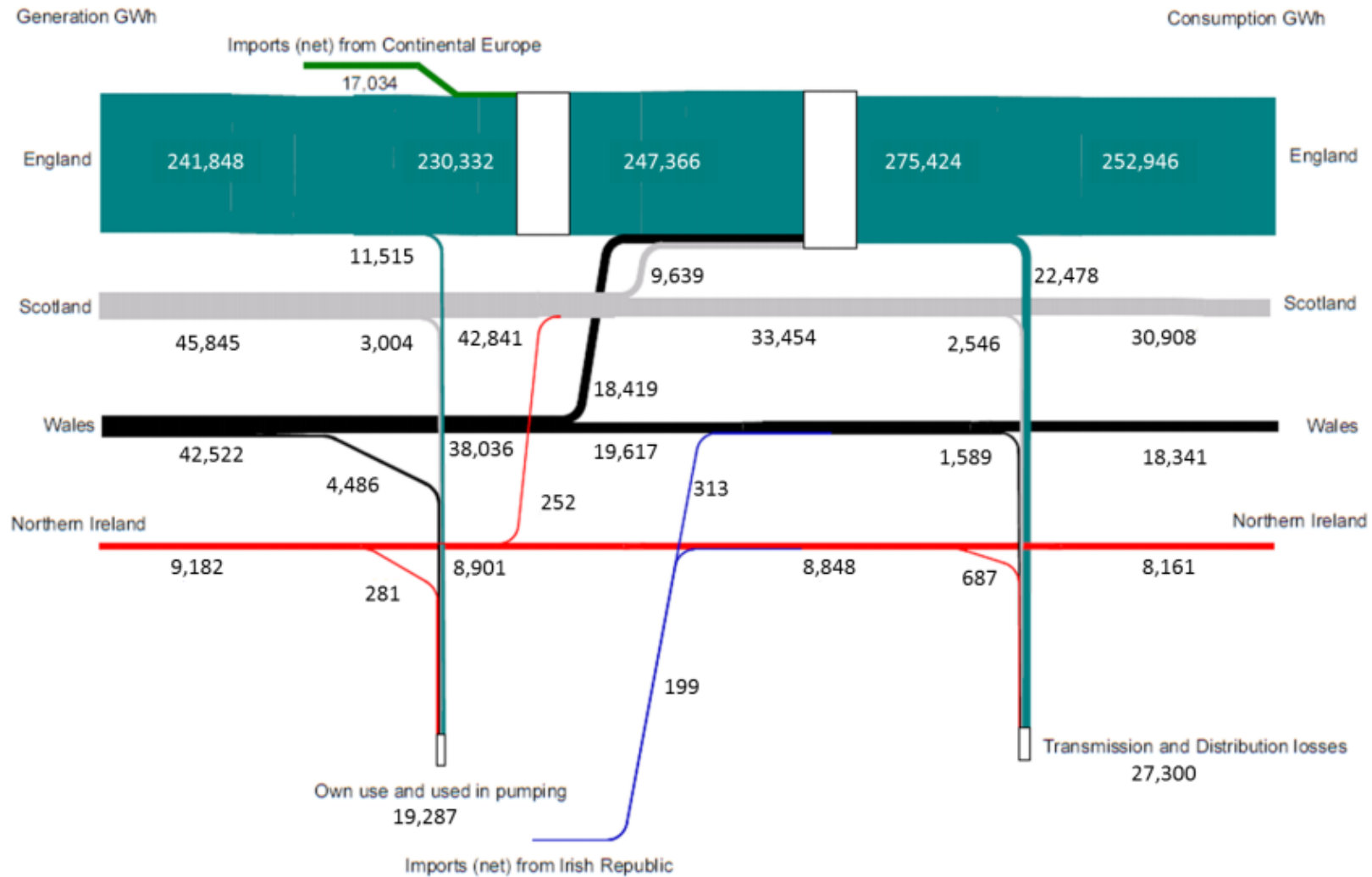
Northern Ireland trades electricity with the Republic of Ireland and had been a net exporter between 2004 and 2013 (see Table 3.3); however it became a net importer from the Republic of Ireland in 2014 and this remained the case in 2015 and 2016 (though net imports were small in each of these years at less than 200 GWh).

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<sup>71</sup> Autogenerators are companies who produce electricity as part of their manufacturing or other commercial activities, but whose main business is not electricity generation. Such generation is typically for sole use by the business and not for supply to the electricity network. As such, this generation and consumption would not be captured in meter readings.

<sup>72</sup> This derived figure for consumption for Northern Ireland for 2016 (i.e. 7,247 GWh) differs from that presented earlier (i.e. 7,794 GWh in Chart 3.2). More information on such differences is given in Annex 3.4.

Chart 3.4 Electricity generation and consumption flow chart, 2016



Source: BEIS

## Imports, exports and transfers of electricity in Northern Ireland

As noted earlier, Northern Ireland has connection to the Republic of Ireland and Scottish electricity networks (via the North-South tie-lines and Moyle Interconnector respectively). Table 3.3 below highlights the volume of electricity that has passed between these countries in recent years.

Table 3.3 Annual imports, exports and transfers of electricity (GWh), 2002 – 2017

Year	Imports	Exports	Transfers	
	Ireland → NI	NI → Ireland	Scotland → NI	NI → Scotland
2002	140.43	147.98	815.51	0.00
2003	119.35	86.28	1,011.92	0.00
2004	0.32	1,574.21	2,793.08	0.00
2005	1.14	2,074.16	1,687.02	0.17
2006	9.93	1,787.94	941.01	35.69
2007	53.27	1,381.99	1,729.77	2.22
2008	151.56	373.33	700.14	155.25
2009	85.30	452.20	1,950.88	14.17
2010	145.42	379.13	2,298.14	0.69
2011	120.73	365.82	1,769.07	0.00
2012	172.73	333.00	2,164.31	1.93
2013	156.70	201.95	1,551.37	10.74
2014	243.03	122.14	1,108.81	64.77
2015	244.78	77.64	685.01	493.54
2016	319.32	120.02	438.46	690.43
2017 <sup>73</sup>	135.36	190.40	746.96	891.74

Source: BEIS<sup>74</sup>

Table 3.3 shows that, with the exception of 2003, Northern Ireland exported more electricity to the Republic of Ireland than it received in imports from this source in each year from 2002 to 2013. Differences were particularly large for the period 2004-2007 when Northern Ireland exported a significant amount of electricity to the Republic of Ireland. Indeed, exports to the Republic of Ireland in 2005 and 2006 were larger than the transfers from Scotland in the same years.

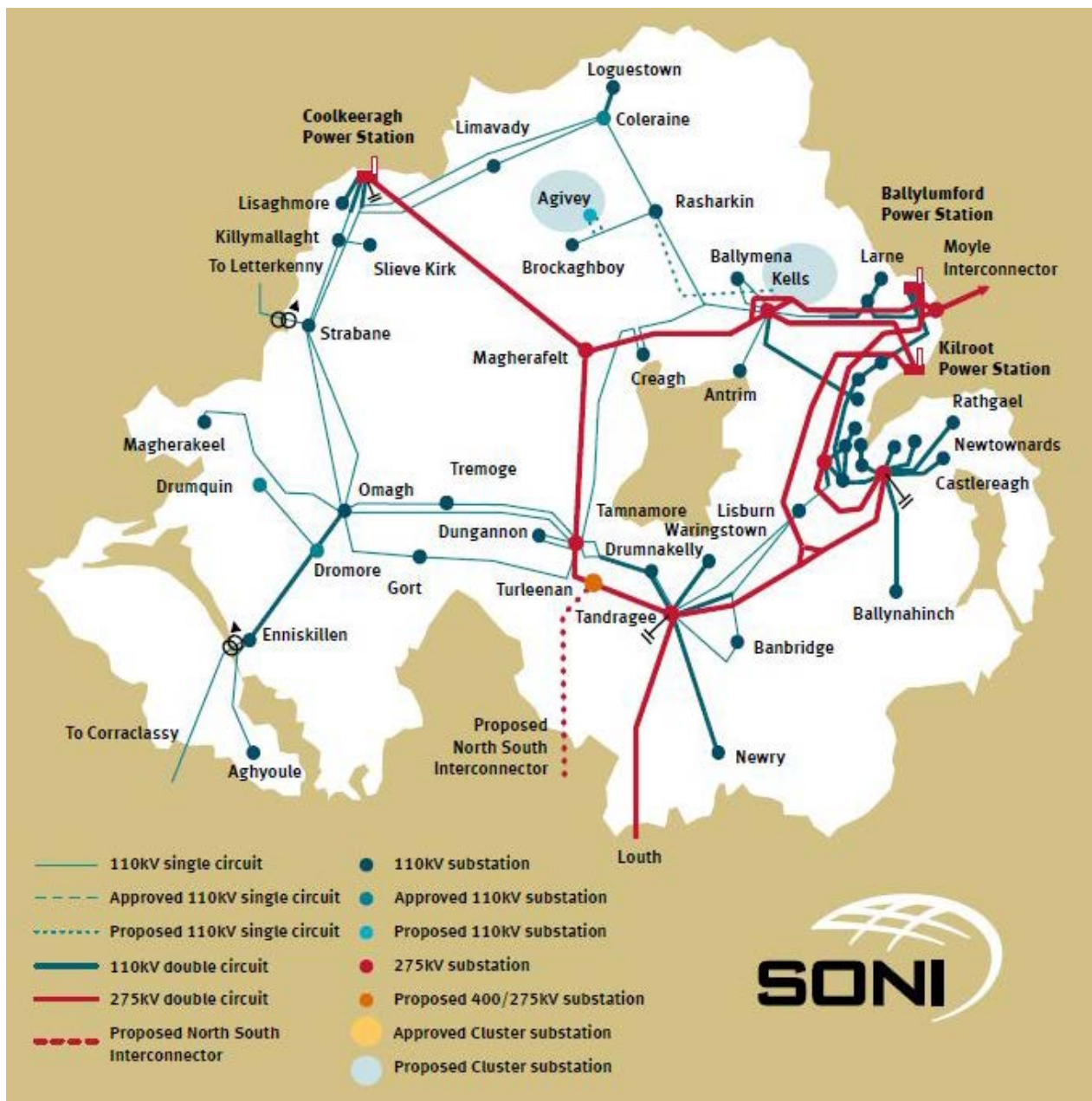
In each year 2014 to 2016, however, Northern Ireland imported more electricity from the Republic of Ireland than it exported, although the imports and exports totals account for a relatively small proportion of overall consumption of electricity (as shown earlier total electricity consumption was around 7,800 to 8,000 GWh in Northern Ireland in each year 2014-2016). Provisional data for 2017 show Northern Ireland import and export volumes were similar and also, again, overall export and import volumes are relatively low compared to total electricity consumption. In addition, unlike the previous three years, Northern Ireland exported more electricity to the Republic of Ireland than it received in imports in 2017.

<sup>73</sup> Data for 2017 is provisional and subject to revision. Latest updated data is available [here](#) (see Table ET5.6).

<sup>74</sup> Full annual and quarterly tables are available in Table ET5.6 [here](#).

Transfers of electricity from Scotland via the Moyle Interconnector were significant in the years 2009 to 2013 when such transfers accounted for around one quarter of all electricity consumed in Northern Ireland over that period and transfers of electricity from NI to Scotland were very small during these years. However, this has changed significantly since then. Transfers of electricity from Scotland fell to around 14% of total electricity consumption in Northern Ireland in 2014 (exports to Scotland were up but still low). By 2015, transfers from Scotland accounted for less than 9% of all electricity consumed in Northern Ireland (with export volumes to Scotland now equivalent to 6% of NI consumption whereas in all previous years exports accounted for less than 1%). By 2016, electricity transfers from Scotland accounted for less than 6% of consumption but, more noticeably, exports to Scotland from NI were more than the volume imported (and equivalent to about 9% of NI electricity consumption). Furthermore, data for the first three quarters of 2017 show this trend continuing with the volume of electricity transferred from Northern Ireland to Scotland almost twice the volume imported from Scotland.

Annex 3.1 Map of transmission system network for Northern Ireland



Source: SONI

### Annex 3.2 Mapping old council areas to new super council areas

Table 3.1 presents data for the new 11 council areas in Northern Ireland. However, the underpinning data is currently available from BEIS for the old 26 district council areas only. In order to provide data for the 11 new council areas, the data for the old 26 district councils published by BEIS has been aggregated as detailed in the table below. Please note that this is a ‘best fit’ of old council areas to new council areas and, as some of the new council areas include parts of old council areas, it is therefore an approximation of consumption for those new council areas.

For further information, a map of the previous and new local government districts can be found at [https://www.nisra.gov.uk/sites/nisra.gov.uk/files/publications/11DC\\_Guidance\\_1\\_2.pdf](https://www.nisra.gov.uk/sites/nisra.gov.uk/files/publications/11DC_Guidance_1_2.pdf).

New Council Areas:	Old Council Areas included in aggregation for Table 3.1:
Antrim & Newtownabbey	Antrim and Newtownabbey
Ards & North Down	Ards and North Down
Armagh City, Banbridge & Craigavon	Armagh, Banbridge and Craigavon
Belfast	Belfast
Causeway Coast & Glens	Ballymoney, Coleraine, Limavady and Moyle
Derry City & Strabane	Derry and Strabane
Fermanagh & Omagh	Fermanagh and Omagh
Mid and East Antrim	Ballymena, Carrickfergus and Larne
Mid Ulster	Cookstown, Dungannon and Magherafelt
Newry, Mourne & Down	Down and Newry & Mourne
Lisburn & Castlereagh	Castlereagh and Lisburn

Data as published by BEIS for the old 26 district council areas is available overleaf.

## Sub-national electricity consumption – ‘old’ 26 district council areas

Table 3.4 Experimental Electricity Consumption Statistics at District Council Level, 2015-16<sup>75</sup>

District Council	Domestic			Non-domestic		
	Total consumption (kWh)	Total number of meters	Average consumption per meter (kWh)	Total consumption (kWh)	Total number of meters	Average consumption per meter (kWh)
Antrim	86,886,900	22,590	3,800	175,807,900	1,730	101,600
Ards	136,653,600	35,890	3,800	107,772,100	2,380	45,300
Armagh	100,125,800	24,500	4,100	117,139,700	2,300	50,900
Ballymena	107,937,500	27,650	3,900	211,225,100	2,430	86,900
Ballymoney	52,533,700	12,660	4,100	37,011,300	1,020	36,300
Banbridge	81,658,900	20,660	4,000	71,702,000	1,570	45,700
Belfast	427,539,900	140,040	3,100	1,013,320,300	12,350	82,100
Carrickfergus	63,966,000	17,900	3,600	78,402,100	890	88,100
Castlereagh	108,922,700	30,560	3,600	119,300,900	1,460	81,700
Coleraine	107,576,500	30,330	3,500	154,230,000	2,370	65,100
Cookstown	61,574,900	14,300	4,300	160,484,400	1,530	104,900
Craigavon	150,149,400	40,680	3,700	370,904,000	3,070	120,800
Derry	152,531,100	45,700	3,300	359,290,800	3,850	93,300
Down	119,498,600	30,540	3,900	115,711,600	2,490	46,500
Dungannon	94,451,600	23,090	4,100	213,473,300	2,600	82,100
Fermanagh	97,423,600	27,680	3,500	247,307,600	2,710	91,300
Larne	54,066,100	15,100	3,600	60,821,100	1,070	56,800
Limavady	50,038,000	13,550	3,700	45,784,000	1,140	40,200
Lisburn	193,813,300	52,150	3,700	240,693,200	3,560	67,600
Magherafelt	68,543,700	16,830	4,100	82,695,200	1,730	47,800
Moyle	30,357,300	8,730	3,500	22,405,900	740	30,300
Newry & Mourne	157,108,900	39,940	3,900	192,338,800	3,820	50,400
Newtownabbey	134,235,700	38,310	3,500	189,743,600	2,140	88,700
North Down	135,094,800	36,820	3,700	122,797,300	2,180	56,300
Omagh	79,903,200	20,850	3,800	104,473,400	2,090	50,000
Strabane	62,197,200	16,590	3,700	70,777,900	1,380	51,300
Unallocated	10,324,700	4,550	2,300	26,042,100	290	89,800
<b>Total</b>	<b>2,925,113,800</b>	<b>808,170</b>	<b>3,600</b>	<b>4,705,129,400</b>	<b>64,850</b>	<b>72,600</b>

Source: BEIS<sup>76</sup>

<sup>75</sup> This covers the period 1 April 2015 to 31 March 2016.

<sup>76</sup> Full sub-national domestic and non-domestic electricity consumption spreadsheets for Northern Ireland are available [here](#) and [here](#).



### Annex 3.3 Generation and Supply

As noted earlier Northern Ireland has three main electricity generating plants, a number of renewable generators and interconnection with grids in the Republic of Ireland and Scotland. All of these combine to fulfil the total electricity requirement for Northern Ireland. The table below, produced annually by BEIS, gives information on the generation and supply of electricity for each country of the UK. The latest available data relates to 2016.

Table 3.5 Generation and supply of electricity in the UK, England, Scotland, Wales and Northern Ireland (GWh), 2016

		England	Scotland	Wales	Northern Ireland	UK
(A)	Electricity Generated by Major power producers (MPPs)	208,235	38,119	39,232	7,358	292,944
(B)	Minus Electricity Used in pumping at pumped storage and other own use by MPPs	-9,262	-2,622	-4,276	-194	-16,354
(C)	Equals Electricity supplied (net) by MPPs	198,972	35,497	34,957	7,164	276,590
(D)	Electricity Generated by Other generators	33,613	7,726	3,290	1,823	46,453
(E)	Minus Own use by other generators	-2,253	-382	-210	-88	-2,933
(F)	Minus Consumption by autogenerators	-16,507	-3,866	-1,621	-914	-22,907
(G)	Equals Electricity supplied (net) by Other generators	14,853	3,479	1,459	822	20,613
(H)	Total electricity generated = (A) + (D)	241,848	45,845	42,522	9,182	339,397
(J)	Total electricity supplied (net) by indigenous generators = (C) + (G)	213,826	38,975	36,415	7,987	297,203
(K)	Electricity transferred to England (imports minus exports)	28,058	-9,639	-18,419	-	-
(L)	Electricity transferred to Northern Ireland (imports minus exports)	0	252	0	-252	0
(M)	Electricity transferred to Europe (imports minus exports)	17,034	0	313	199	17,546
(N)	Total transfers = (K) + (L) + (M)	45,092	-9,387	-18,106	-53	17,546
(P)	Total electricity supplied (indigenous generation plus imports minus exports) = (J) + (N)	258,917	29,588	18,309	7,934	314,749
(Q)	Minus Transmission losses	-6,136	-656	-424	-179	-7,395
(R)	Minus Distribution losses and theft	-16,341	-1,890	-1,165	-508	-19,905
(S)	Equals Consumption from public supply	236,440	27,042	16,720	7,247	287,449

Source: BEIS<sup>77</sup>

<sup>77</sup> Full publication is available [here](#).

The previous table shows figures on total generation, consumption, transfers and losses for the four regions of the UK and the UK total for 2016. The data is derived from a survey of major power producers and other generators.

The table shows that England is reliant on substantial imports of electricity from Wales & Scotland and from continental Europe (via the France and Netherlands interconnectors) to meet its electricity demands. Of particular note, in 2016 Wales exported just over half of its net electricity supplied by indigenous generators to England (i.e. transfers of 18,419 GWh to England out of 36,415 GWh net electricity supplied by indigenous generators in Wales).

Wales started trading with the Republic of Ireland in 2012 and was a net exporter to them each year up to 2015, with some sizeable volumes exported during this period. For example, in 2014, some 2,408 GWh out of 29,177 GWh (or 8.3%) of Wales's net electricity supplied by indigenous generators was exported to the Republic of Ireland. However, in 2016, this reversed for the first time with Wales importing 313 GWh more electricity from Ireland than it supplied.

Northern Ireland was a net importer in terms of electricity trades with the Republic of Ireland (via the North-South tie-lines) in 2016, though the net amount was small at 199 GWh. This is the third year in a row (2014-16) that Northern Ireland has imported more electricity from the Republic of Ireland than it exported whereas the opposite was the case in every year back to 2004. For the first time, Northern Ireland was a net exporter of electricity to Scotland (via the Moyle interconnector) in 2016 though, again, the net amount was small at 252 GWh net exports but this is a significant change from previous years when imports via the Moyle Interconnector were substantial (for example, over the period 2009-2014 an annual average of over 1,800 GWh of electricity were transferred from Scotland to Northern Ireland).

What is notable about the BEIS data (as shown in Table 3.5 above and Table 3.3 earlier) is that, for 2016, Northern Ireland was able to meet its own electricity demands without relying on imports or transfers of electricity from other countries.

### Annex 3.4 Differences in Consumption Measures

The consumption data in Table 3.5 (produced by BEIS) differs from those presented in Chart 3.2 (produced by DfE) as they are calculated in different ways. The following table shows the consumption figures from the two sources for the period 2010 to 2016. In the period 2010-2012, differences were small between the DfE estimates of consumption, as sourced from NIE Networks, and those published by BEIS (at 1% or less). Between 2013 and 2016, the differences in electricity consumption figures between the two sources was higher at around 5-7%.

Table 3.6 Electricity Consumption in Northern Ireland by publication source, 2010 to 2016

Year	DfE	BEIS	Difference (DfE Compared to BEIS)	% Difference (DfE Compared to BEIS)
2010	8,432	8,484	-52	-0.6%
2011	8,235	8,221	+14	+0.2%
2012	8,095	8,011	+84	+1.0%
2013	8,181	7,757	+424	+5.2%
2014	8,022	7,429	+593	+7.4%
2015	7,819	7,327	+492	+6.3%
2016	7,794	7,247	+547	+7.0%

Source: BEIS and DfE

The BEIS consumption estimates are, in essence, 'calculated' consumption figures – that is, they are derived by taking total generation minus own use, any net exports and any transmission and distribution losses then adding net imports with the residual figure being called consumption. The figures presented earlier (in Chart 3.2) are those used in DfE's Electricity Consumption and Renewable Generation in Northern Ireland publication to measure progress against the Programme for Government (PfG) target and are based on actual consumption from aggregated meter readings rather than a 'calculated' consumption figure. However, as shown in the table above, the two methodologies can produce fairly similar estimates of Northern Ireland electricity consumption.

## Chapter 4: Renewable Electricity

### Summary of key points

- The Northern Ireland Executive's Programme for Government (PfG) target for 2011-15 was to "Encourage achievement of 20% of electricity consumption from renewable sources by 2015" and this was met during 2015.
- The Executive's Strategic Energy Framework (SEF) includes a target to achieve 40% of electricity consumption from renewable sources by 2020. The proportion reached a peak of 35.2% for the 12 month periods ending January 2018 and March 2018.
- The annual proportion of electricity consumption from renewable sources in Northern Ireland has risen considerably in recent years, from 8.4% in 2010 to 34.7% in 2017.
- Wind remains the dominant source of renewable electricity generation in Northern Ireland accounting for 75% of volume generated in 2016. Wind also accounted for some 80% of installed renewable capacity, though this was down from 94% in 2011 due to the growth of other technologies like solar PV and bioenergy. Such reliance on wind does mean that monthly renewable electricity generation volumes in Northern Ireland can be prone to large fluctuations, due to changing weather conditions.
- In recent years, the volume of renewable electricity generated in Northern Ireland has steadily increased as has the number of sites and installed capacity at sites generating electricity from renewable sources. The volume of renewable electricity generated in 2017 (2,710 GWh) was almost four times the volume generated in 2010 (706 GWh).
- Around three quarters of renewable electricity capacity and generation was accounted for by three of the 11 Northern Ireland district council areas namely: Causeway Coast & Glens; Derry City & Strabane; and Fermanagh & Omagh.
- For Northern Ireland, the main fuel type used in electricity generation was gas accounting for half (50.0%) of all indigenous generation in 2016 which was a slightly higher proportion compared to England (45.0%), significantly higher than Scotland (6.8%) but lower than in Wales (62.9%).
- In terms of the percentage of total indigenous electricity generation accounted for by indigenous renewable generation, Northern Ireland had the second highest proportion (25.3%) of all four UK regions in 2016 using this measure. Scotland had the highest proportion (42.9%) with the UK average at 24.5%.

## Introduction

As noted in Chapter 3, there are an increasing number of renewable electricity generators in Northern Ireland. This chapter describes the available data on such electricity generation.

## Definition

Renewable energy can be defined as energy derived from natural processes (e.g. sunlight and wind) that are replenished at a faster rate than they are consumed<sup>78</sup>. Solar, wind, geothermal, hydro, and some forms of biomass are common sources of renewable energy. Renewable electricity is therefore any electricity generated from any of these sources.

## Measuring the PfG and SEF targets

One of the Northern Ireland Executive's Programme for Government (PfG) targets for 2011-15 was to "Encourage achievement of 20% of electricity consumption from renewable sources by 2015"<sup>79</sup>. In addition, the Executive's Strategic Energy Framework (SEF) includes a target to achieve 40% of electricity consumption from renewable sources by 2020<sup>80</sup>. DfE's bi-annual 'Electricity Consumption and Renewable Generation in Northern Ireland' publication aids reporting on performance against both the PfG target and SEF target<sup>81</sup>.

In these cases, renewable electricity generation data is derived by aggregating output (excluding any transmission and distribution losses) from renewable electricity generators who are connected to the transmission and distribution network using a combination of data held by Northern Ireland Electricity Networks Ltd (NIE Networks) and the System Operator for Northern Ireland (SONI)<sup>82</sup>.

Electricity consumption data is calculated by aggregating actual and estimated meter readings across both domestic and non-domestic sectors in Northern Ireland. The NIE Networks electricity consumption data includes all electricity consumed in Northern Ireland across both domestic and non-domestic sectors regardless of where the electricity was generated (i.e. it will also include consumption of any imported electricity).

Therefore, the reported percentage against the target (or headline measure) is calculated by expressing renewable electricity generation as a percentage of electricity consumption, as defined above, on a rolling 12 month average basis. The rolling 12 month average helps to take account of monthly variations to provide a better measure of the underlying trend.

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<sup>78</sup> Taken from International Energy Agency – see <http://www.iea.org/about/glossary/r/#tabs-2>

<sup>79</sup> See <https://www.northernireland.gov.uk/publications/programme-government-2011-2015> for more information on the Programme for Government.

<sup>80</sup> See <https://www.economy-ni.gov.uk/sites/default/files/publications/deti/sef%202010.pdf>

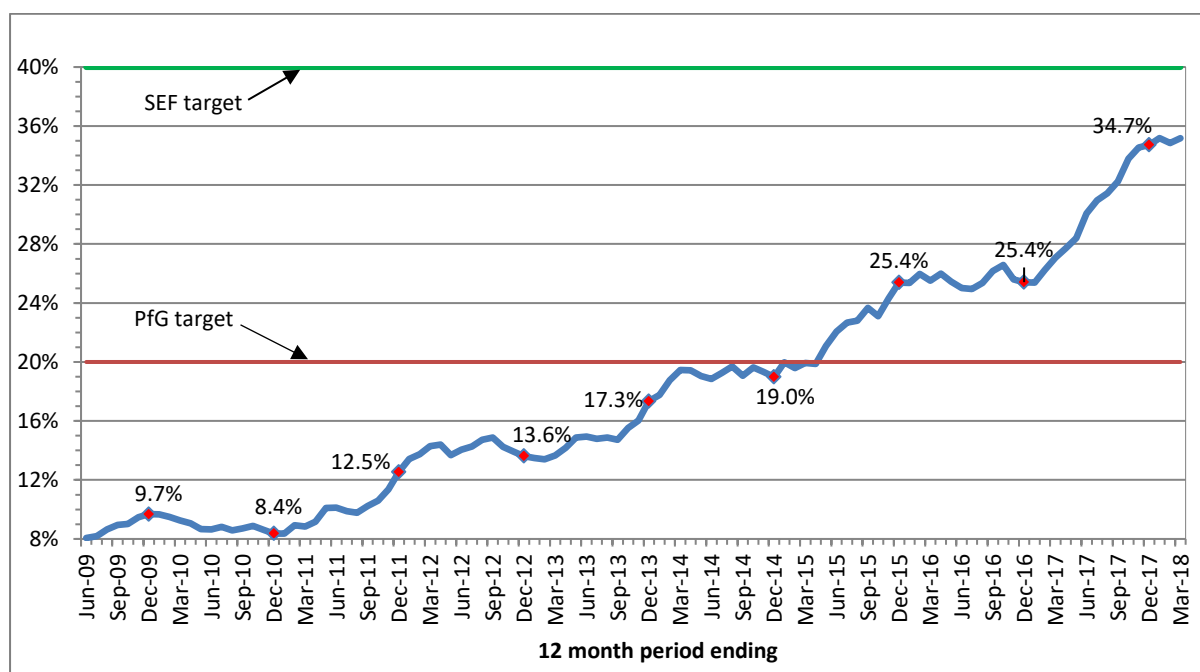
<sup>81</sup> More information on this publication is available [here](#).

<sup>82</sup> Electricity produced by those who generate their own electricity (mainly for their own use but some of which may 'spill' onto the distribution network) is excluded as information about such 'micro generation' or consumption is not readily available to NIE Networks. Also, some imported electricity that is consumed in Northern Ireland will have been generated from renewable sources outside Northern Ireland. However, the full extent of this is unknown and therefore cannot be reported separately.

## Headline Measure – Rolling 12 month average

For the 12 month period April 2017 to March 2018, 35.2% of total electricity consumption in Northern Ireland was generated from renewable sources. This represents an increase of 8.1 percentage points on the previous 12 month period (April 2016 to March 2017) and is the joint highest rolling 12 month proportion on record.

Chart 4.1: Rolling 12 month Average % Electricity Consumption from Renewable Sources, June 2009 – March 2018



Source: DfE

Chart 4.1 above shows the trend in the percentage of electricity consumption in Northern Ireland from renewable sources. In the 12 month period ending June 2009, some 8.1% of total electricity consumption in Northern Ireland was generated from renewable sources. This proportion has grown considerably with over one third (35.2%) of total electricity consumption in Northern Ireland being generated from renewable sources for the 12 month period ending March 2018. This represents a more than fourfold increase in average renewable generation volumes in comparison to the 12 month period ending June 2009. As the chart above shows, the PfG target of 20% was exceeded during 2015 and reached a peak of 35.2% for the 12 month periods ending January 2018 and March 2018.

## Annual Proportion

Chart 4.1 above also shows the proportion of total electricity consumption from renewable sources for each calendar year end. After a slight drop in the renewable proportion between 2009 (9.7%) and 2010 (8.4%), electricity generation from renewable sources in Northern Ireland as a percentage of electricity consumption in Northern Ireland rose steadily to 25.4% in 2015 and 2016, and then a large rise to 34.7% in 2017. In addition to the 9.3 percentage point rise between 2016 and 2017, there were large rises of around 4 percentage points between 2010 and 2011 (from 8.4% to 12.5%) and between 2012 and 2013 (from 13.6% to 17.3%) and a rise of over 6 percentage points between 2014 and 2015

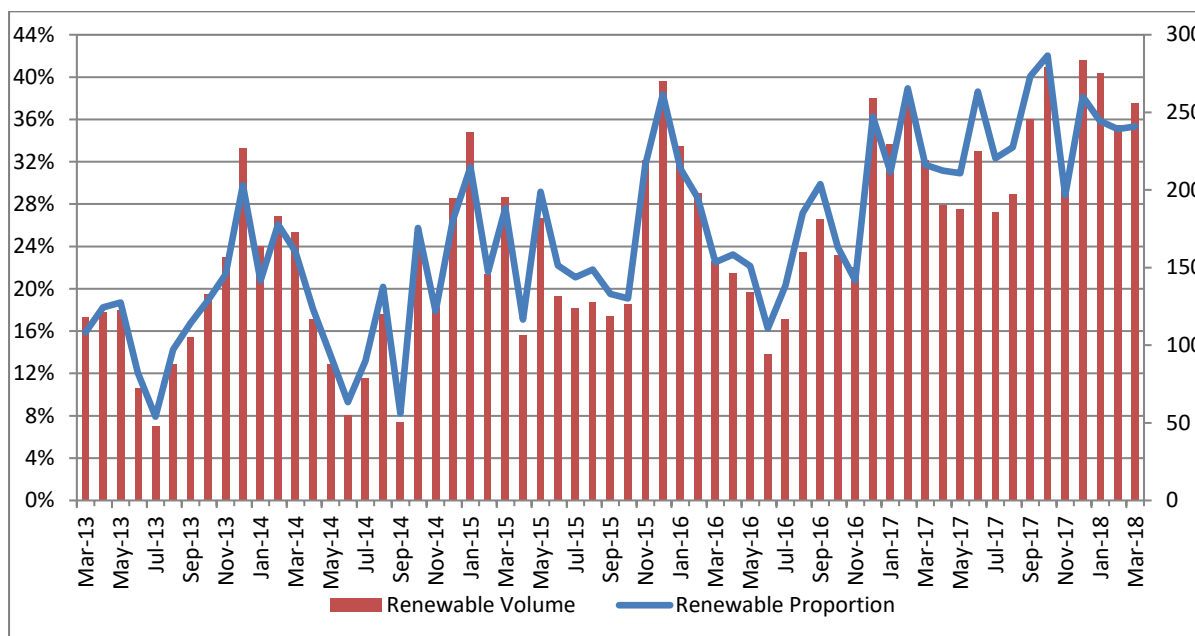
(19.0% to 25.4%). Such large rises are usually attributable to new renewable generation facilities coming on line and/or increased wind levels during the year.

### Monthly Proportion

The proportion of electricity consumption derived from renewable sources varies markedly from month to month, as shown in Chart 4.2. For example, in October 2017, generation from renewable sources located in Northern Ireland accounted for over two fifths (42.0%) of all electricity consumed in Northern Ireland in that month. However, this compares to around 8% in July 2013 and September 2014. Such variation is due to large fluctuations in renewable electricity generation each month, caused mainly by changing weather conditions and also increases in new renewable generating installations. Given the reliance on wind generation in Northern Ireland, weather plays an important role in the volume of renewable electricity generation. Other factors, such as new renewable generation facilities coming on line at various points, can also contribute to shifts in the renewable proportion. In general, renewable generation volumes are lower in the summer months (when it is less windy) and higher in winter when wind levels are increased. Such changes in renewable generation correlate directly with the large monthly variation in the proportion of electricity consumption from renewable sources, as shown in Chart 4.2.

The rolling 12 month average helps to take account of such monthly variations to provide a better measure of the underlying trend (as shown earlier in Chart 4.1).

Chart 4.2: Percentage of Electricity Consumption from Renewable Sources and Renewable Generation Volume (GWh) by month, March 2013 - March 2018



Source: DfE

Chart 4.2 also highlights the close relationship between renewable volumes and the overall renewable proportion. The renewable proportion for measuring against the PfG and SEF targets (i.e. renewable generation in Northern Ireland divided by total consumption in Northern Ireland) is heavily influenced by changes in renewable generation (i.e. the numerator) and less so by changes in consumption (the

denominator)<sup>83</sup>. As the chart above shows, the volume of renewable electricity generated can change significantly from month to month whereas changes in consumption from month to month tend to be less marked.

### Volume – Rolling 12 month period

Renewable generation volumes were some 1,456 GWh for the 12 month period ending January 2014 but have risen to a high of over 2,777 GWh for the 12 month period ending March 2018 (a rise of about 91%). Total electricity consumption showed a decline over the four year period from January 2014 to December 2017 and consumption at the end of 2017 was some 5% lower than at the beginning of 2014; however consumption has shown a slight rise in early 2018.

Chart 4.3: Rolling 12 month Volume of Electricity Consumed by Source<sup>84</sup> (GWh), January 2014 – March 2018



Source: DfE

As Chart 4.3 shows, for the 12 month period April 2017 to March 2018, approximately 7,894 Gigawatt hours (GWh) of total electricity was consumed in Northern Ireland. Of this, some 2,777 GWh was generated from renewable sources within Northern Ireland.

<sup>83</sup> Annex 4.1 shows the monthly renewable proportion mapped against monthly total consumption.

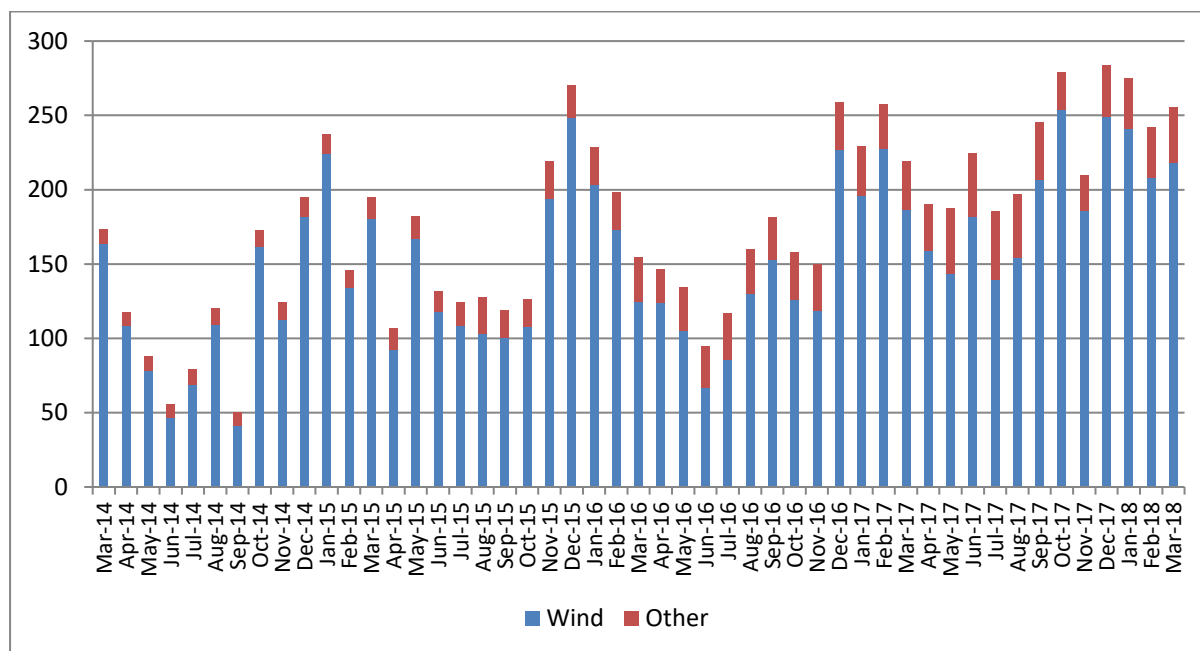
<sup>84</sup> Non-renewable volumes are calculated by subtracting indigenous renewable generation from total consumption. It should be noted that all imported electricity is categorised as non-renewable even though some may actually have come from renewable sources. However, information on the total volume of imported electricity from renewable sources is not known.



## Volume – monthly

As noted earlier, given Northern Ireland’s reliance on wind for producing renewable electricity, such generation can vary markedly from month to month. As Chart 4.4 shows, there can be noticeable changes in monthly generation and the vast majority of renewable generation in Northern Ireland is still from wind sources, though the proportion of renewable electricity coming from other sources has increased (mainly due to rises in biogas, biomass and solar PV).

Chart 4.4: Monthly Volume of Renewable Electricity Generated (GWh), March 2014 – March 2018



Source: DfE

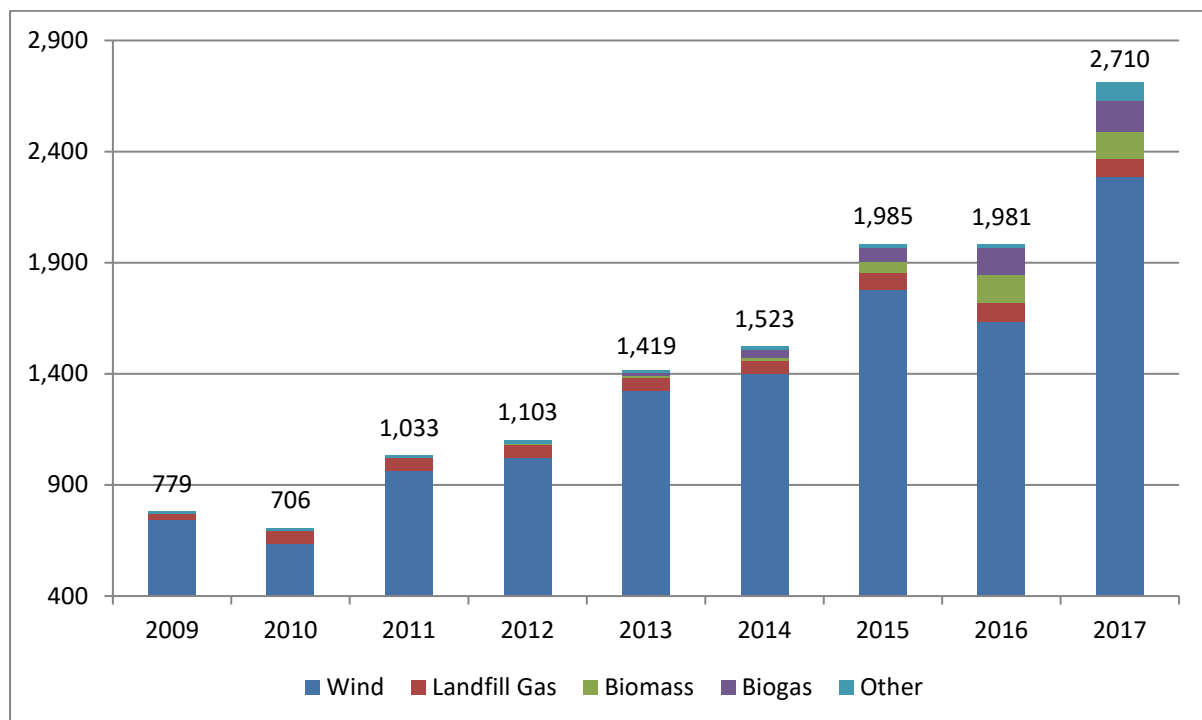
Renewable generation volumes are lower in the summer months (when it is less windy) and higher in winter when wind levels are increased. New renewable generation facilities coming on line at various points can also contribute to shifts in renewable generation volumes. Renewable electricity generation from sources other than wind are much more stable with no large monthly fluctuations. Volumes from these other sources<sup>85</sup>, whilst relatively small in overall terms, have grown significantly over the period shown: volumes in March 2018 (37.5 GWh) were around four times the volume at March 2014 (around 9.8 GWh). Indeed in some months (particularly summer months when wind generation tends to be low), other renewable sources have accounted for a substantial portion of renewable electricity generated (e.g. almost 30% in June 2016 and 20% or more of renewable electricity generated on seven other occasions).

<sup>85</sup> Other sources include landfill gas, biogas, biomass, hydro, Combined Heat and Power (CHP), tidal and solar.

## Volume – Calendar Year

The chart below shows the total volume of renewable electricity generated in Northern Ireland for each calendar year 2009 to 2017, split by type of renewable generation. Total renewable generation volumes have increased substantially in recent years; they have almost quadrupled between 2010 and 2017 (from around 706 GWh in 2010 to some 2,710 GWh in 2017). Again, wind is the largest contributor (it accounted for over 84% of total renewable generation in 2017), but there have been increases in all types of renewable electricity generation over the period.

Chart 4.5 Annual Volume of Renewable Electricity Generated by Type of Generation (GWh), 2009 to 2017



Source: DfE

Renewable generation from landfill gas sources remained stable between 2010 and 2014, contributing some 60 GWh annually to renewable generation volumes for Northern Ireland and this increased to over 80 GWh in 2016 and 2017. Whilst landfill gas represented over 8% of total renewable generation in 2010, this has fallen to around 3% of total renewable generation in 2017 due to significant increases in other renewable sources.

Generation from biogas and biomass has shown significant growth in recent years. In 2011, there was less than 1 GWh in generation from these two sources but by 2017 there was a combined total of 260.3 GWh (140.9 GWh from biogas and 119.4 GWh from biomass) and together they represented 9.6% of total renewable generation volumes for Northern Ireland in 2017. In addition, generation volumes from solar PV increased markedly in 2017 with 67.2 GWh of generation compared to less than 2 GWh in 2016 and less than 1 GWh in every previous year.

## Other Renewable Electricity Data – UK and UK Regions

The Department for Business, Energy & Industrial Strategy (BEIS) produce a range of data on renewable electricity, including some at a UK regional level<sup>86</sup>. The key tables are presented here.

Table 4.1 Number of sites generating electricity from renewable sources, 2016

	Wind	Hydro	Wave & Tidal	Landfill Gas	Sewage Gas	Other Bioenergy	Total exc PV	Solar PV	Total
England	3,761	277	2	363	166	504	5,073	677,632	682,705
East Midlands	389	25	-	39	15	67	535	80,595	81,130
East of England	851	6	-	69	14	61	1,001	96,257	97,258
North East	260	11	-	20	7	19	317	44,357	44,674
North West	471	52	-	49	24	67	663	79,117	79,780
London	31	-	-	5	10	18	64	21,658	21,722
South East	106	18	-	70	33	43	270	102,099	102,369
South West	745	106	1	39	18	67	976	112,190	113,166
West Midlands	162	20	-	30	20	96	328	63,574	63,902
Yorkshire and the Humber	746	39	1	42	25	66	919	77,785	78,704
Wales	571	189	1	25	16	32	834	51,998	52,832
Scotland	3,144	464	11	46	8	62	3,735	53,027	56,762
<b>Northern Ireland</b>	<b>935</b>	<b>66</b>	<b>-</b>	<b>16</b>	<b>2</b>	<b>74</b>	<b>1,093</b>	<b>22,779</b>	<b>23,872</b>
<i>Other Sites</i>	862	321	-	-	-	143	1,326	94,654	95,980
<b>UK Total</b>	<b>9,273</b>	<b>1,317</b>	<b>14</b>	<b>450</b>	<b>192</b>	<b>815</b>	<b>12,061</b>	<b>900,090</b>	<b>912,151</b>

Source: BEIS

Table 4.1 shows that there were 1,093 non-PV<sup>87</sup> sites in Northern Ireland generating electricity from renewable sources, with 5,073 non-PV sites in England, 3,735 in Scotland and 834 in Wales<sup>88</sup>. There are large numbers of solar PV sites and these constitute the vast majority of sites in each country (99% for England, 98% for Wales, 93% for Scotland and 95% for Northern Ireland) although the majority of these will be on domestic properties generating electricity for their own consumption. There has been huge growth in the number of sites generating electricity from renewable sources in Northern Ireland over the last 10 years, particularly in solar PV installations, as shown below.

Table 4.2 Number of sites generating electricity from renewable sources in NI, 2004-2014

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Non-PV	81	105	110	430	463	502	577	674	817	911	1,093
Solar PV	7	7	7	250	309	484	1,449	5,231	11,878	18,675	22,779
<b>Total</b>	<b>88</b>	<b>112</b>	<b>117</b>	<b>680</b>	<b>772</b>	<b>986</b>	<b>2,026</b>	<b>5,905</b>	<b>12,695</b>	<b>19,586</b>	<b>23,872</b>

Source: BEIS

<sup>86</sup> Data for tables 4.1 to 4.5 are available [here](#).

<sup>87</sup> Figures for Solar PV (Photo Voltaic) sites includes all small solar PV installations, the majority of which will be on single domestic properties for own consumption. PV uptake for Northern Ireland (22,779) is based on data from the Microgeneration Certification Scheme and the Renewables Obligation.

<sup>88</sup> There are a further 94,654 PV schemes and 1,326 non-PV schemes in other sites that, due to lack of appropriate geographical information, could not be assigned to one of the four countries.

## Renewable Installed Capacity – UK and UK Regions

Table 4.3 shows there was over 2,700 megawatts<sup>89</sup> (MW) of installed capacity at sites generating electricity from renewable sources in 2016 in Northern Ireland, which is about 3.1% of total UK renewable capacity. England accounts for 60.7% of total UK installed capacity, Scotland 24.2% and Wales 7.6%<sup>90</sup>.

Table 4.3 Installed capacity of sites generating electricity from renewable sources, 2016 (MW)

	Wind	Hydro	Wave & Tidal	Landfill Gas	Sewage Gas	Other Bioenergy	Solar PV	Total
England	7,111.1	34.4	0.1	879.3	237.4	3,895.7	9,503.5	21,661.5
East Midlands	842.9	4.2	-	68.0	20.3	198.7	1,260.2	2,394.3
East of England	1,513.8	0.1	-	185.5	17.6	232.8	1,794.0	3,743.8
North East	460.2	7.8	-	45.0	11.5	175.4	191.0	890.8
North West	1,711.4	7.4	-	134.8	31.4	210.9	410.9	2,506.9
London	11.3	-	-	25.8	58.7	193.2	90.9	379.9
South East	1,170.1	0.7	-	166.6	32.0	317.9	1,849.3	3,536.7
South West	310.6	9.9	-	100.5	14.6	145.6	2,806.2	3,387.5
West Midlands	7.5	1.1	-	60.9	35.0	177.9	658.5	941.0
Yorkshire and the Humber	1,083.3	2.9	0.1	92.3	16.3	2,243.2	442.5	3,880.6
Wales	1,541.2	161.0	0.4	47.3	12.5	105.6	843.1	2,711.1
Scotland	6,462.2	1,533.0	13.0	116.3	7.2	255.9	256.2	8,643.9
<b>Northern Ireland</b>	<b>885.7</b>	<b>9.6</b>	<b>-</b>	<b>18.9</b>	<b>0.2</b>	<b>62.7</b>	<b>135.2</b>	<b>1,112.3</b>
<i>Other Sites</i>	216.7	96.9	-	-	-	96.6	1,160.8	1,570.9
<b>UK Total</b>	<b>16,216.9</b>	<b>1,834.8</b>	<b>13.5</b>	<b>1,061.9</b>	<b>257.3</b>	<b>4,416.5</b>	<b>11,898.7</b>	<b>35,699.7</b>

Source: BEIS

Wind accounts for 45% of total installed renewable capacity in the UK, however this varies considerably among the UK regions. For example, in the West Midlands (which has a similar total installed capacity to Northern Ireland) wind accounts for less than 1% of installed capacity whilst in Northern Ireland some 80% of installed capacity is in wind. Wind is also the predominant source of installed capacity in Scotland (75%) and Wales (57%) but in England it accounts from a much lower proportion (33%).

In England solar PV (44%) and other bioenergy (18%) together account for over 60% of installed capacity, whereas these two renewable sources account for only 6% of installed capacity for Scotland and 18% for Northern Ireland.

The volume of renewable installed capacity has increased significantly in recent years in all regions of the UK. For example, Northern Ireland had over two and a half times more renewable installed capacity in 2016 than in 2011, England over three and a half times more, Wales had seen a threefold increase and Scotland over one and half times more renewable installed capacity over the five year period. The growth in solar PV installed capacity has been particularly striking with each region

<sup>89</sup> Megawatts are used to measure the output of a power plant. One megawatt (MW) = 1,000 kilowatts = 1,000,000 watts.

<sup>90</sup> Around 4.4% of installed capacity is in other sites that could not be assigned to one of the four countries.

showing a large increase, though admittedly from a low base in many regions. The Northern Ireland Renewables Obligation (NIRO) scheme has obviously impacted here, particularly for microgenerators<sup>91</sup> installing solar PV technology but the opening of some larger 'solar farms' will have impacted also. Northern Ireland has seen a huge rise in installed solar PV capacity from only 1.8MW in 2011 (equivalent to 0.4% of all installed renewable capacity in Northern Ireland in 2011) to 135.2MW in 2016 (equivalent to over 12% of all installed renewable capacity in Northern Ireland in 2016).

Whilst increases in solar PV capacity are significant it is worth noting that wind retains its role as the dominant source of renewable capacity for Northern Ireland. In 2016, wind still accounted for some 80% of installed renewable capacity, though this was down from 94% in 2011 due to the growth of other technologies like solar PV and bioenergy. Of the growth in installed capacity between 2011 and 2016 in Northern Ireland (an increase of 676.3MW) over 70% of the rise was due to increases in wind capacity, 20% due to solar PV and about 9% from bioenergy.

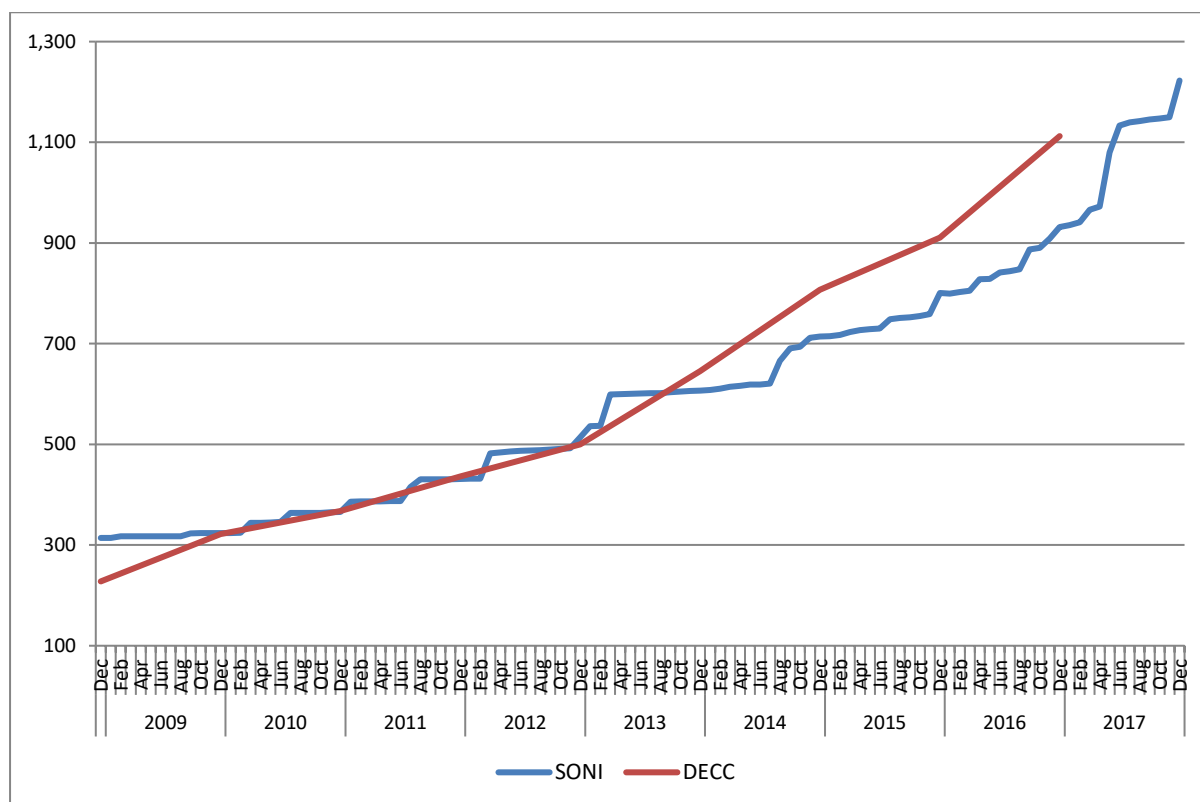
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<sup>91</sup> Under the Northern Ireland Renewables Obligation (NIRO) scheme, generating stations with a capacity of 50kW or less are termed as 'Micro-NIRO' stations.

## Monthly Installed Capacity Data

SONI also produce data on installed renewable capacity. As the chart below shows, installed renewable capacity has been increasing steadily over recent years. Note that the monthly series shows how the total installed capacity in Northern Ireland can increase in ‘steps’ as new renewable generation facilities are installed.

Chart 4.6 Monthly and Annual Installed Renewable Capacity (MW) for Northern Ireland, 2008 - 2017



Source: SONI and BEIS

In general, the SONI installed capacity figure should be lower than the BEIS figure because BEIS include all microgeneration capacities, whereas SONI do not<sup>92</sup>. However, as the chart shows, the divergence in the two measures began in 2013, which would be mainly due to more recent increases in microgeneration installations (this is highlighted by the large growth in solar PV sites in Northern Ireland shown in Table 4.2 earlier).

The most recent figures published by BEIS relate to the end of 2016 and show an installed capacity of over 1,112 MW for Northern Ireland. The SONI data for December 2016 indicates installed capacity of around 932 MW (which is around 16% less than the BEIS figure). Whilst some of this difference may be due to different data collection methodologies between the two sources, microgeneration (particularly solar PV) will account for the majority of the variation between the SONI and BEIS totals. It is obvious from both sources of data that renewable installed capacity has increased significantly in recent years. For example, using BEIS data shows that there is almost five times the renewable

<sup>92</sup> It is mainly micro-solar PV information that is not available to SONI, however they do include data for small scale wind which would include most wind microgeneration (i.e. single wind turbines on domestic or commercial properties).

installed capacity in Northern Ireland in 2016 compared to 2008 and capacity more than doubled over the period 2012-2016.

Whilst capacity doubled between 2012 and 2016, this increase was not shared evenly among the different renewable technology types. Over 90% of the increase in installed capacity over this period (an increase of approximately 613 MW) was due to increases in just two renewable technologies: wind (+423 MW) and solar PV (+130 MW).

The more recent renewable installed capacity data from SONI (up to December 2017) shows some further 'step' changes for Northern Ireland during 2017. These were due to new wind farms coming online but also increases due to large solar PV sites being connected at the end of the year. Interestingly, in December 2017 some 85.8% of renewable installed capacity was due to large or small scale wind, whereas wind accounted for approximately 90% or more in every previous month (back to 2008). Wind still dominates but the technology mix is changing.

### Generation Volumes – UK and UK Regions

Table 4.4 below shows the actual volume of electricity generated from renewable sources for the latest year available, 2016. This again highlights that the majority of renewable electricity generated in Northern Ireland is wind generated – some 1,732.3 GWh out of a total 2,324.7 GWh, or 75%, but this proportion has fallen in recent years as other technologies have taken a larger share. For example, in 2011, over 90% of renewable generation in Northern Ireland was wind generated with bioenergy accounting for 2% and solar PV only 0.1%. By 2016, this had changed to wind accounting for 75%, bioenergy 16% and solar PV around 5% of all renewable generation, so the generation mix has changed considerably in only a few years.

Table 4.4 Generation of electricity from renewable sources, 2016 (GWh)

	Wind	Hydro	Wave & Tidal	Landfill Gas	Sewage Gas	Other Bioenergy	Solar PV	Total
England	19,456.0	100.2	-	3,960.9	871.9	21,753.7	8,466.7	54,609.4
East Midlands	2,302.2	14.5	-	281.6	92.8	950.5	1,139.0	4,780.6
East of England	4,489.7	0.3	-	838.0	67.7	1,122.9	1,638.3	8,156.9
North East	1,016.7	30.4	-	148.9	27.7	575.8	146.7	1,946.3
North West	4,450.1	20.1	-	466.9	121.0	863.7	353.2	6,275.0
London	14.9	0.0	-	165.5	140.8	647.2	79.7	1,048.1
South East	3,686.7	1.9	-	850.7	136.0	1,065.8	1,709.1	7,450.2
South West	589.6	22.2	-	467.4	56.1	331.6	2,481.5	3,948.3
West Midlands	14.2	3.0	-	313.8	155.8	659.7	542.3	1,688.8
Yorkshire and the Humber	2,891.9	7.9	-	428.1	74.0	15,536.5	376.8	19,315.3
Wales	3,400.9	307.5	-	155.5	45.8	515.9	714.0	5,139.5
Scotland	12,340.5	4,765.0	0.0	492.8	32.0	1,357.8	221.6	19,209.8
<b>Northern Ireland</b>	<b>1,732.3</b>	<b>23.6</b>	<b>-</b>	<b>93.7</b>	<b>0.6</b>	<b>364.2</b>	<b>110.3</b>	<b>2,324.7</b>
<i>Other Sites</i>	437.5	198.5	-	0.0	0.0	397.9	907.8	1,941.7
<b>UK Total</b>	<b>37,367.3</b>	<b>5,394.8</b>	<b>0.0</b>	<b>4,702.9</b>	<b>950.3</b>	<b>24,389.5</b>	<b>10,420.4</b>	<b>83,225.1</b>

Source: BEIS

Wind is also the prevalent renewable generation source in Scotland (64%) and Wales (66%) but accounted for a little over one third (36%) of all renewable electricity generated in England. England has considerable bioenergy and landfill gas resources (indeed, England accounted for 89% and 84% of total UK generation for those sources respectively in 2016) and bioenergy alone accounted for 40% of all renewable electricity generated in England with the majority of this being generated in one English region (Yorkshire and the Humber).

The vast majority (88%) of Hydro renewable electricity is generated in Scotland. England accounts for around 90% of all renewable electricity generated from Sewage Gas or Other Bioenergy in the UK (as well as accounting for some 84% of Landfill Gas and 81% of Solar PV renewable electricity generation). Overall, Northern Ireland accounted for 2.8% of total renewable electricity generated in the UK in 2016 and 4.6% of all renewable electricity generated from wind sources in the UK.

The renewable electricity generation volumes produced by BEIS as shown above do not match exactly with the data published by DfE (and sourced from NIE Networks and SONI) as shown in Chart 4.5 earlier. Annex 4.2 shows a comparison of the two sources and seeks to explain any differences.

### Sub-regional Renewable Data

BEIS also produce renewable electricity data at a District Council level (the previous 26 council areas) for Northern Ireland<sup>93</sup>. The latest year available is for 2016 and results have been aggregated into the new 11 'super council' areas as shown in Table 4.5 below<sup>94</sup>.

Table 4.5 Renewable electricity generation, capacity and site numbers by District Council Area as at end 2016

District Council	Number of sites	Capacity (MW)	Generation (MWh)
Antrim & Newtownabbey	57	45	99,138
Ards & North Down	22	5	10,194
Armagh City, Banbridge & Craigavon	77	17	52,163
Belfast	12	7	12,872
Causeway Coast & Glens	111	218	417,222
Derry City & Strabane	97	304	714,676
Fermanagh & Omagh	94	270	598,922
Mid & East Antrim	79	31	68,711
Mid Ulster	111	66	159,982
Newry, Mourne & Down	64	11	31,041
Lisburn & Castlereagh	43	17	54,781
Unallocated	23,106	123	104,972
<b>Total</b>	<b>23,873</b>	<b>1,112</b>	<b>2,324,674</b>
Unallocated as % of Total	97%	11%	5%

Source: BEIS

<sup>93</sup> Full tables are available [here](#)

<sup>94</sup> Data for the old 26 District Council Areas and details of how the data was aggregated into the new council areas is provided in Annex 4.4 for information.



‘Unallocated’ means those sites (and associated capacity and generation) that were not able to be matched to a council area due to incomplete or a lack of postcode information. As the table shows, the vast majority of sites (around 97%) were unallocated. However, further analysis shows that the vast majority (22,705 or over 98%) of the 23,106 unallocated sites are solar PV sites and, as shown in Table 4.5 above, unallocated sites account for only 11% of capacity and 5% of generation.

The table shows that around three quarters of renewable electricity capacity (71%) and generation (74%) was accounted for by 3 of the 11 council areas namely: Causeway Coast & Glens; Derry City & Strabane; and Fermanagh & Omagh. This is perhaps unsurprising given that the majority of the large onshore wind turbines would be located in these council areas<sup>95</sup>. In general, the majority of capacity and generation is located in rural areas with large urban areas like Belfast or Lisburn & Castlereagh accounting for a very small proportion (around 3% combined) of renewable capacity and generation.

### Electricity generation by fuel type - UK countries

Data is also available, for each of the four UK countries, in relation to the shares of generation of electricity by fuel type<sup>96</sup>. For Northern Ireland, gas is the main fuel type used in electricity generation accounting for half of all indigenous generation in 2016. Gas generation was also the main fuel type used for electricity generation in England (45%), Wales (62.9%) and for the UK as a whole (42.2%) but was responsible for only 6.8% to Scotland’s total electricity generation.

Table 4.6 Shares of each country’s generation, by fuel type, 2015 and 2016

	UK	Scotland	Wales	<b>Northern Ireland</b>	England
<b>2015</b>					
Coal	22.4%	16.1%	21.5%	<b>24.4%</b>	23.8%
Gas	29.5%	3.7%	46.2%	<b>49.1%</b>	31.6%
Nuclear	20.8%	34.6%	10.2%	-	20.2%
Renewables	24.6%	42.4%	13.7%	<b>25.5%</b>	22.5%
Oil and Other	2.8%	3.2%	8.3%	<b>0.9%</b>	1.9%
<b>2016</b>					
Coal	9.0%	3.9%	17.2%	<b>23.3%</b>	8.0%
Gas	42.2%	6.8%	62.9%	<b>50.0%</b>	45.0%
Nuclear	21.1%	42.8%	0.0%	-	21.5%
Renewables	24.5%	42.9%	12.3%	<b>25.3%</b>	23.1%
Oil and Other	3.1%	3.5%	7.6%	<b>1.3%</b>	2.2%

Source: BEIS

Coal was also an important fuel used in electricity generation in Northern Ireland (23.3%) in 2016, a much higher proportion compared to England (8%) and Scotland (about 4%). Coal’s share of electricity generation for Scotland and England between 2015 and 2016 (and subsequently the UK as a whole) showed a large drop due to reduced capacity after the closure or partial closure of multiple coal plants<sup>97</sup>. There was an increase in the share of gas generation between 2015 and 2016 in all countries as gas replaced coal in the energy mix. As an example of how the mix has changed in just a few years,

<sup>95</sup> See [here](#) for a list of wind farm locations in Northern Ireland.

<sup>96</sup> Taken from BEIS ‘Special feature - Sub national electricity figures’ publication [link here](#)

<sup>97</sup> See page 67 of [this link](#) for more details

coal was the dominant fuel type used for electricity generation in England (39%), Wales (44%) and the UK as a whole (36%) in 2013 and accounted for over one third (34%) of generation, in Northern Ireland and one fifth for Scotland (20%) in that year.

In Scotland, renewable and nuclear generation accounted for similar shares of generation in 2016 (about 43% each) with coal generation falling from just over 16% in 2015 to less than 4% in 2016. Nuclear accounted for over one fifth of all electricity generation in England and for the UK as a whole in both 2015 and 2016. One notable change was that there was no nuclear generation in Wales in 2016, due to the closure of the Wylfa nuclear plant in December 2015.

Renewables' share of generation has increased substantially in all regions in recent years (see Table 4.7) though there was little change in the proportions for all regions between 2015 and 2016.

### Renewable electricity generation by country – comparable basis

In the UK, the share of renewables in electricity generation or sales can be measured in different ways<sup>98</sup>. Table 4.7 shows the 'headline' overall measure for 2006 to 2016 which is the percentage of electricity generation accounted for by all renewable generation. Whilst the proportions shown in the table below for Northern Ireland are different from those presented earlier (in Chart 4.1) the regional percentages in Table 4.7 are all calculated on the same basis and, therefore, are directly comparable.

Table 4.7 Comparable renewables percentages for the UK and UK countries, 2006 to 2016<sup>99</sup>

	UK	Scotland	Wales	<b>Northern Ireland</b>	England
2006	4.6%	13.3%	3.9%	<b>3.4%</b>	3.1%
2007	5.0%	17.1%	4.2%	<b>4.4%</b>	3.2%
2008	5.6%	18.1%	4.5%	<b>6.3%</b>	3.6%
2009	6.7%	20.8%	5.5%	<b>10.2%</b>	4.2%
2010	6.9%	19.2%	5.3%	<b>10.2%</b>	4.8%
2011	9.6%	27.3%	7.7%	<b>13.8%</b>	6.4%
2012	11.3%	29.1%	6.9%	<b>16.0%</b>	8.5%
2013	14.9%	32.0%	6.6%	<b>19.5%</b>	12.4%
2014	19.1%	38.1%	9.6%	<b>21.6%</b>	16.5%
2015	24.6%	42.4%	13.7%	<b>25.5%</b>	22.5%
2016	24.5%	42.9%	12.3%	<b>25.3%</b>	23.1%

Source: BEIS

The table shows that Scotland had, by far, the highest renewable percentage of the four UK countries with over two fifths (42.9%) of electricity generation in 2016 accounted for by renewable generation. Northern Ireland had the second highest proportion in each of the years shown except 2006 when the proportion was slightly lower than in Wales. Renewable generation in Northern Ireland accounted for over one quarter of all electricity generation in Northern Ireland in 2015 and 2016 using this headline

<sup>98</sup> A second measure is based on the Renewables Obligation (RO) which shows the percentage of electricity sales accounted for by renewables eligible under these obligations. However, on a RO basis the percentage measure for the UK (15% in 2013, 18% in 2014, 23% in 2015 and 23% in 2016) is not meaningful at sub-national level as electricity generated in one part of the UK can be sold in a different part of the UK. There is also a third method used by the EU – a Renewables Directive basis – see Chapter 6 of the Digest of UK Energy Statistics 2014, table 6.7 and paragraph 6.54 ([link here](#)).

<sup>99</sup> See spreadsheet [here](#) for data for the UK and UK countries from 2004 to 2016.

measure. It should be noted that the amount of electricity from renewable sources transferred from Scotland or Wales to England, or from Scotland to Northern Ireland (or vice versa), is not known.

The large increase in the share of generation from renewable sources over time for the UK and all UK countries is evident from the table above. In 2006, only 3.4% of all electricity generated in Northern Ireland was from renewable sources but by 2016 the proportion was some 7.5 times higher. A similar increase was seen in England while the renewables proportion for Scotland and Wales more than trebled over the ten year period and was over five times higher for the UK as a whole.

The renewable electricity percentages produced by BEIS in Table 4.7 above and the underpinning methodology do not match with the annual percentages published by DfE (and sourced from NIE Networks and SONI) as shown in Chart 4.1 earlier. Annex 4.3 shows a comparison of the two sources and seeks to explain any differences.

### **Renewable Energy Planning Data**

Table 4.8 overleaf shows the number of planning applications received by the Department for Infrastructure for each year 2004/05 to 2017/18, split by type of renewable energy installation.

The table shows that there was a large increase in applications between 2009/10 and 2010/11; applications peaked in 2011/12 but, by 2016/17 and also in 2017/18, had fallen back to levels seen in 2004/05. Of all planning applications received in relation to renewable energy over the period 2004/05 – 2017/18, around 8 out of every 10 were for single wind turbines. Note, however, that planning permission is required for all wind turbines (including those for domestic purposes, hospitals, factories, farms, schools etc.) whilst solar panels on domestic properties can be installed without the need to apply for planning permission provided certain conditions are met. The large fall seen in applications in 2016/17 is likely due to the Northern Ireland Renewable Obligation (NIRO) scheme closing to micro-NIRO wind in July 2016.

Table 4.8: Applications Received from 2004/05 to 2017/18 by Renewable Energy Type

	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	Total
Single wind turbine <sup>100</sup>	47	87	136	172	226	159	629	674	614	547	421	245	35	30	4,022
Wind farm	21	13	18	19	15	16	17	12	6	21	13	14	1	6	192
Hydroelectricity	0	3	6	1	2	10	16	30	23	20	17	7	4	3	142
Solar panels <sup>101</sup>	3	31	19	40	22	11	5	36	124	69	61	43	18	5	487
Biomass/Anaerobic digester	2	3	3	5	6	4	31	68	31	16	20	17	22	10	238
Other	0	0	0	5	3	3	6	0	3	5	4	3	1	4	37
<b>Total</b>	<b>73</b>	<b>137</b>	<b>182</b>	<b>242</b>	<b>274</b>	<b>203</b>	<b>704</b>	<b>820</b>	<b>801</b>	<b>678</b>	<b>536</b>	<b>329</b>	<b>81</b>	<b>58</b>	<b>5,118</b>

Source: Department for Infrastructure

Table Notes:

1. All applications received in the period may not have had a decision issued within the same time period. Applications received may also include some applications that are subsequently withdrawn.
2. Data for 2017/18 is the latest available, provisional, renewable energy information. Full tables are available [here](#).
3. Other includes, Landfill Gases, Waste Incineration and Heat Pumps.

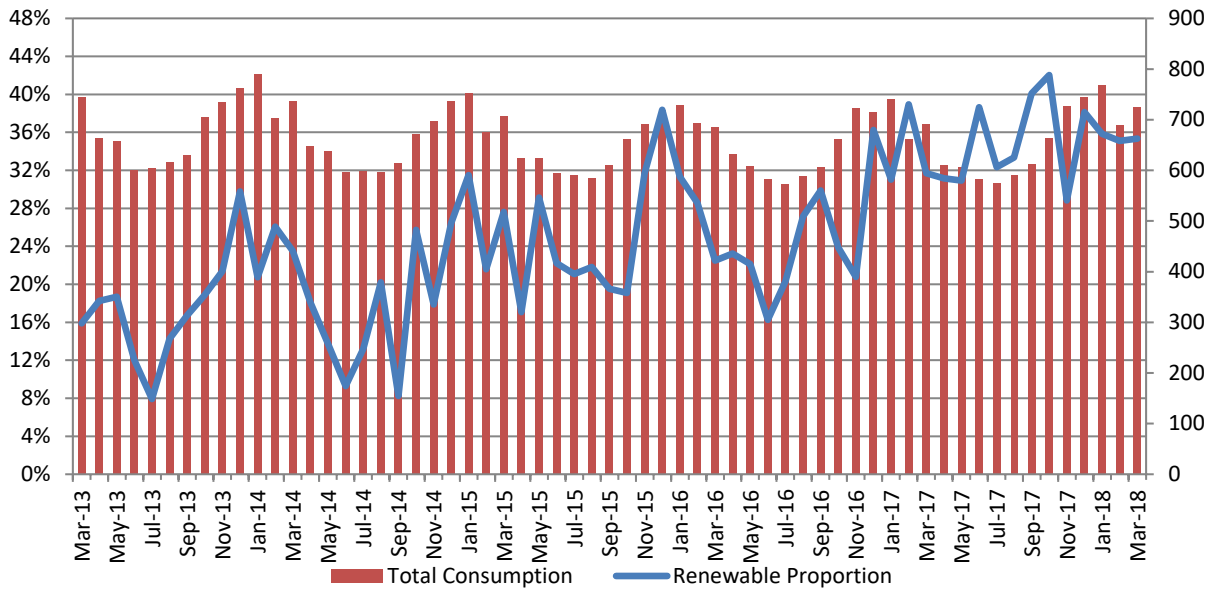
<sup>100</sup> Planning permission is required for all wind turbines. This includes turbines for: domestic purposes, hospitals, factories, farms, schools etc. (see [here](#) for further details).

<sup>101</sup> Solar panels on domestic properties can be installed without the need to apply for planning permission provided a number of limitations and conditions are met (see [here](#) for further details).

### Annex 4.1 Renewable Proportion and Total Consumption Volume by month

The chart below highlights the seasonal nature of electricity consumption (i.e. higher in winter months and lower in summer months). Whilst a change in total consumption does have some effect on the renewable proportion, it is renewable generation that has a much more significant impact on the proportion as shown in Chart 4.2 earlier.

Chart 4.7 Percentage of Electricity Consumption from Renewable Sources and Total Consumption Volume (GWh) by month, March 2013 – March 2018

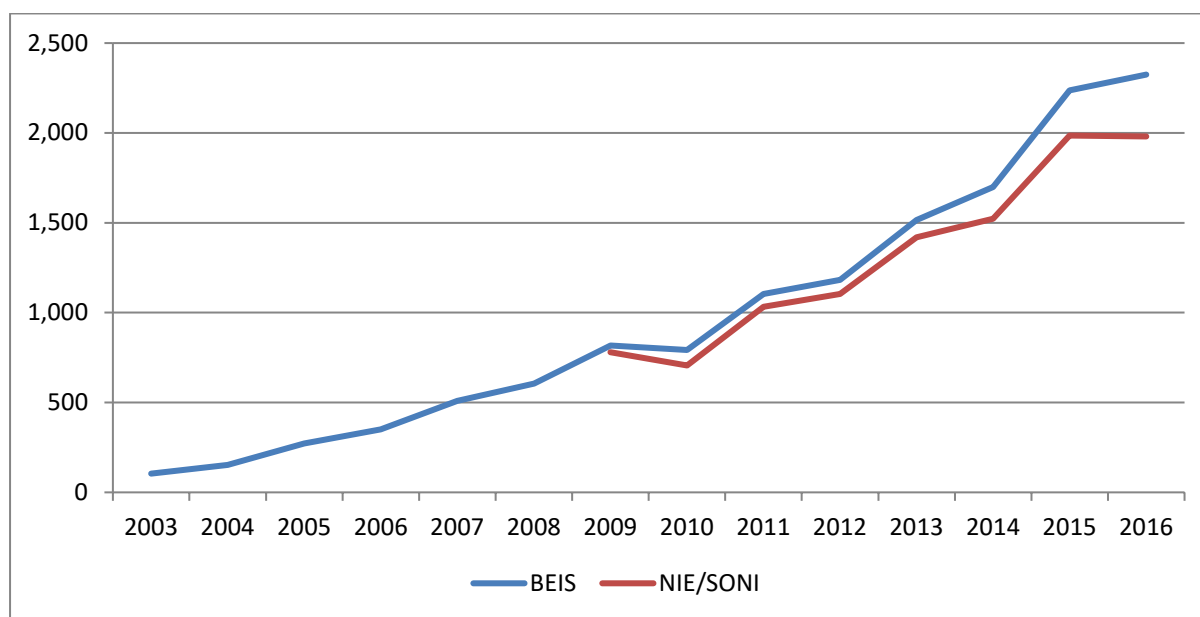


Source: DfE

## Annex 4.2 Comparisons of Annual Renewable Generation Volume Data

BEIS have published a consistent series on annual renewable generation volumes from 2003 onwards<sup>102</sup> and the most recent data from this series was in Table 4.4 earlier. NIE Networks provide data to DfE on a monthly basis to allow the compilation of the bi-annual Electricity Consumption and Renewable Generation in Northern Ireland publication, as shown in Chart 4.5 earlier. Annual data from this source is available from 2009 onwards. The chart below compares these two sources.

Chart 4.8 Annual Volume of Renewable Electricity Generated (GWh), BEIS and NIE Networks sources



Source: BEIS; NIE Networks and SONI

The chart shows that, in general, BEIS estimates were around 7% higher than those from SONI/NIE Networks between 2009 and 2013 (except for 2010 when they were 12% higher). The difference increased to around 12% in 2014 and 2015 and increased again to 17% in 2016, although the general trend in each series is similar. The renewable electricity generation data published biannually by DfE is derived by aggregating output from renewable electricity generators who are connected to the transmission and distribution network using a combination of data held by NIE Networks and SONI excluding any transmission and distribution losses. Microgenerators would not be included as they are not directly connected to the transmission and distribution network.

The BEIS data is derived from a combination of sources<sup>103</sup>: a survey of major electricity generators and ROCs data which covers smaller sites and includes microgeneration (this is estimated for sites where ROCs data are issued only annually, which is generally the case for all microgeneration). Transmission or distribution losses are not deducted. In summary, other than the different data collection methodologies, the main reasons for the difference between BEIS data and the NIE Networks/SONI renewable generation volume data is due to the inclusion by BEIS of both microgeneration volumes and transmission and distribution losses in the data they publish.

<sup>102</sup> Available at <https://www.gov.uk/government/statistics/regional-renewable-statistics>

<sup>103</sup> Further detail is available [here](#).

### Annex 4.3 Comparisons of Annual Renewable Percentages

The table below shows the renewable percentages for Northern Ireland for the period 2010-2016 as produced by DfE and BEIS. In general, the proportion published by BEIS were around 2 percentage points higher than the corresponding figure published by DfE between 2010 and 2014. However, for 2015 and 2016 the proportions were almost identical.

Table 4.9: Comparison of BEIS and DfE renewable electricity generation proportions

	DfE	BEIS	Percentage Point Difference (BEIS minus DfE)	Net transfers from Scotland (transfers in minus transfers out) GWh	Net imports from Republic of Ireland (imports minus exports) GWh	Total net transfers/ imports for Northern Ireland GWh
2010	8.4%	10.2%	1.8	2,297.5	-233.7	2,063.7
2011	12.5%	13.8%	1.3	1,769.1	-245.1	1,524.0
2012	13.6%	16.0%	2.4	2,162.4	-160.3	2,002.1
2013	17.3%	19.5%	2.1	1,540.6	-45.3	1,495.4
2014	19.0%	21.6%	2.6	1,044.0	120.9	1,164.9
2015	25.4%	25.5%	0.1	191.5	167.1	358.6
2016	25.4%	25.3%	-0.1	-252.0	199.3	-52.7

Source: DfE and BEIS

BEIS proportions are based on indigenous generation only – that is, indigenous renewable electricity generation divided by all indigenous electricity generation. The percentages published by DfE, to report against the PfG target, are indigenous renewable generation divided by total electricity consumption, which will include net imports/transfers of electricity into Northern Ireland. Therefore, when net imports/transfers of electricity into Northern Ireland are high, this will cause a divergence between the BEIS and DfE figures.

The figures in the last three columns of Table 4.9 above are derived from Table 3.3 in Chapter 3 and show that Northern Ireland had significant net transfers via the Moyle Interconnector between 2010 and 2014 (Northern Ireland was a net exporter to the Republic of Ireland during these years but the volumes were much lower than net transfers from Scotland). So while the numerators are the same under both the BEIS and DfE measures, the denominators are different. The DfE denominator will be larger (because for those years Northern Ireland consumed more electricity than it generated) which has the effect of making its reported renewable percentage smaller compared to the ‘headline’ figure reported by BEIS. For 2015 and 2016, however, net transfers from Scotland and net imports from the Republic of Ireland were much lower (i.e. Northern Ireland was more self-reliant in terms of electricity generation) meaning the denominator in both measures would have been much the same and the overall proportions from both measures therefore similar.

In order to compare proportions between Northern Ireland and other countries we must compare proportions that have been calculated on the same basis, therefore the BEIS data presented in Table 4.7 should be used to compare Northern Ireland with other UK countries.

#### Annex 4.4 Mapping old council areas to new super council areas

Table 4.5 presented data for the new 11 council areas in Northern Ireland. However, data is currently available from BEIS for the previous 26 district council areas only. In order to provide data for the 11 new council areas, the data for the previous 26 district councils published by BEIS has been aggregated as detailed in the table below. Please note that this is a 'best fit' of old council areas to new council areas and, as some of the new council areas include parts of old council areas, it is therefore an approximation of consumption for those new council areas.

New Council Areas:	Old Council Areas included in aggregation for Table 3.1:
Antrim & Newtownabbey	Antrim and Newtownabbey
Ards & North Down	Ards and North Down
Armagh City, Banbridge & Craigavon	Armagh, Banbridge and Craigavon
Belfast	Belfast
Causeway Coast & Glens	Ballymoney, Coleraine, Limavady and Moyle
Derry City & Strabane	Derry and Strabane
Fermanagh & Omagh	Fermanagh and Omagh
Mid and East Antrim	Ballymena, Carrickfergus and Larne
Mid Ulster	Cookstown, Dungannon and Magherafelt
Newry, Mourne & Down	Down and Newry & Mourne
Lisburn & Castlereagh	Castlereagh and Lisburn

Data as published by BEIS for the previous 26 district council areas is available overleaf.



## Sub-national renewable electricity data at end 2016 – ‘old’ 26 district council areas

District Council	Number of sites	Capacity (MW)	Generation (MWh)
Antrim	42	18	27,698
Ards	16	3	3,393
Armagh	31	7	23,904
Ballymena	44	26	58,634
Ballymoney	41	98	135,516
Banbridge	32	6	16,006
Belfast	12	7	12,872
Carrickfergus	5	1	1,849
Castlereagh	8	1	1,583
Coleraine	42	10	30,167
Cookstown	30	6	17,107
Craigavon	14	4	12,254
Derry	32	79	276,980
Down	29	4	8,267
Dungannon	44	52	121,778
Fermanagh	41	130	342,164
Larne	30	4	8,227
Limavady	20	109	249,558
Lisburn	35	16	53,198
Magherafelt	37	8	21,097
Moyle	8	1	1,982
Newry & Mourne	35	7	22,774
Newtownabbey	15	27	71,439
North Down	6	2	6,801
Omagh	53	140	256,758
Strabane	65	225	437,697
Unallocated	23,106	123	104,972
<b>Total</b>	<b>23,873</b>	<b>1,112</b>	<b>2,324,674</b>
Unallocated (%)	97%	11%	5%

Source: BEIS

The table above shows that renewable generation and capacity is not shared equally among the ‘old’ District Council Areas. Indeed over half (54%) of generation is accounted for by only four council areas: Strabane (20%), Fermanagh (12%), Omagh (13%) and Limavady (10%). This is perhaps unsurprising given that the majority of the large onshore wind turbines would be located in these council areas<sup>104</sup>.

<sup>104</sup> See [here](#) for a map of wind farm locations in Northern Ireland.

## Chapter 5: Total Energy Consumption

### Summary of key points

- From sources other than electricity and gas, some 34,303 GWh of energy was consumed in Northern Ireland in 2015. Consumption of these energy products in 2015 was some 11% lower than the peak in 2006.
- The largest contributor to these other sources of consumed energy is petroleum products, which generally accounted for around 90% of consumption in each year 2005-2008, around 85% in each year 2009-2012 with the proportion falling slightly in each year 2013-2015 and was standing at 80.6% for 2015 (the lowest proportion over the 11 year period for which data is available).
- Of the 27,646 GWh of petroleum products consumed in Northern Ireland in 2015, just over half was in the Road Transport sector; some 26% was due to domestic consumption and 21% was consumption by industry.
- Coal accounted for around 6-8% of consumption of total energy other than electricity and gas in each year 2005-2009 with the proportion increasing each year up to a high of 11% in 2014. The proportion dropped to 10% for 2015 with industry and commerce accounting for some 86% of total coal consumption and domestic sector consumption accounting for the other 14% in 2015.
- The total number of gas connections in Northern Ireland continues to rise each year, although rises were not seen across all categories. Over the five year period 2012 to 2017 the total number of gas connections in Northern Ireland rose substantially, by almost 70,000 or 40%, with gas consumption rising by around 13% over the same period.
- Some 47,939 GWh of energy was consumed in Northern Ireland in 2015 (13,636 GWh from electricity and gas and 34,303 GWh from other fuels). This was equivalent to 3.3% of the total energy consumption in GB for the same year.
- Between 2007 and 2015, the combined total of diesel and petrol consumed in Northern Ireland due to road transport fell by 10% to just under 1.25 million tonnes of oil equivalent. However, consumption by diesel cars in Northern Ireland rose by 15% whilst consumption by petrol cars and motorcycles fell by almost one quarter (24%) over the same period.
- In each year 2007-2015, around three quarters of all diesel and petrol road transport consumption was due to personal use (i.e. consumption by buses, cars and motorcycles) while the remaining quarter was due to freight transport consumption (i.e. consumption by HGVs and LGVs).

## Introduction

This chapter provides some focus on areas of energy other than electricity. It begins by looking at sub-national final energy consumption data produced by BEIS which is available as a historic series for Northern Ireland and, also, at sub-Northern Ireland level. It then looks at other sources of information on gas, coal and road transport (petrol and diesel) consumption statistics for Northern Ireland. Also included is an estimate of total energy consumption for Northern Ireland calculated using an amalgamation of sources on energy consumption.

### BEIS Total Final Energy Consumption Data

While the total final energy consumption datasets published by BEIS cover each region of the United Kingdom, there are no gas or electricity data included for Northern Ireland. This, according to BEIS, is due to the differences in market structure<sup>105</sup>.

In addition, the datasets also exclude some sectors and fuels. It was recognised that it would not be meaningful to allocate energy consumption locally or regionally for some energy uses, in particular aviation (air transport) and shipping (national navigation). Together these excluded fuels account for around a 15% share of total final energy consumption in the UK<sup>106</sup>.

As shown in Table 5.1 overleaf, for sources other than electricity and gas, some 34,303 GWh of energy was consumed in Northern Ireland in 2015. Overall consumption of these energy products has decreased by 11% from the peak in 2006 and consumption in 2015 was the third lowest level in the 11 year period shown. By way of comparison, Chart 3.2 in Chapter 3 showed that total annual electricity consumption in Northern Ireland was around 7,800 GWh in 2015, so consumption of the other fuel types detailed in Table 5.1, at over 4 times this amount, is indeed significant and worthy of separate consideration.

By far the largest contributor to these other sources of consumed energy is petroleum products<sup>107</sup>: these accounted for around 90% of consumption in each year 2005-2008, around 85% in each year 2009-2012 with the proportion falling slightly in each year 2013-2015 and was standing at 80.6% for 2015 (the lowest proportion over the 11 year period shown). Whilst petroleum products have contributed a decreasing share to final energy consumption, the consumption of bio energy and waste products has seen its share increase from around 3% in the period 2005-2008 to 8.5% in 2015.

Of the 27,646 GWh of petroleum products consumed in Northern Ireland in 2015, just over half was in the Road Transport sector; a further 30% was due to domestic consumption and around 20% was consumption by industry.

Coal accounted for 6-8% of final energy consumption in each year 2005-2009 but the proportion then increased each year up to 2014 when coal accounted for around 11% of total consumption of these fuel types. In 2015, total coal consumption was equivalent to 3,460 GWh (or 10% of total consumption of these fuel types) and, of this, industry and commerce accounted for around 89% of total coal consumption with domestic sector consumption accounting for the other 11%.

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<sup>105</sup> See Sub-national Consumption Statistics Guidance Booklet [here](#) for further details.

<sup>106</sup> See page 66 of the Sub-national Consumption Statistics Guidance Booklet [here](#) for further details.

<sup>107</sup> Petroleum products include petrol, diesel and home heating oil.

Table 5.1 Northern Ireland Final Energy Consumption (GWh), 2005-2015

Year	Coal <sup>(1)</sup>			Manufactured fuels <sup>(2)</sup>			Petroleum products <sup>(1)</sup>					Bio energy & wastes	All fuels	Consuming Sector <sup>(3)</sup>		
	Indust/Comm	Domestic	Total	Indust/Comm	Domestic	Total	Indust/Comm	Domestic	Road transport	Rail	Total	Total	Total	Ind/Comm	Domestic	Transport
2005	1,919.2	342.5	2,261.7	248.4	230.7	479.1	9,866.9	8,482.7	15,101.4	117.9	33,568.8	1,162.4	37,472.1	12,034.5	9,055.9	15,219.4
2006	2,871.7	334.8	3,206.5	194.3	226.7	421.0	8,857.2	9,207.6	15,643.4	117.2	33,825.5	1,016.7	38,469.7	11,923.2	9,769.1	15,760.7
2007	2,108.2	407.4	2,515.6	138.2	214.6	352.8	8,792.7	8,431.9	16,144.2	137.2	33,505.9	1,055.5	37,429.9	11,039.0	9,053.9	16,281.4
2008	2,318.0	442.4	2,760.4	37.2	253.9	291.1	7,322.1	8,745.4	15,924.3	139.8	32,131.7	1,110.5	36,293.7	9,677.2	9,441.8	16,064.3
2009	2,173.7	447.4	2,621.1	62.8	159.1	221.9	6,359.7	8,982.7	15,821.4	140.5	31,304.3	2,152.7	36,300.0	8,596.1	9,589.2	15,962.0
2010	2,611.7	477.5	3,089.2	45.7	178.0	223.7	6,704.6	10,235.0	15,324.6	139.8	32,404.0	2,373.6	38,090.5	9,361.9	10,890.5	15,464.6
2011	2,446.3	473.7	2,920.0	34.9	169.3	204.2	6,102.5	7,988.2	15,164.6	138.6	29,394.0	1,871.7	34,389.9	8,583.7	8,631.2	15,303.4
2012	2,689.4	450.1	3,139.4	36.6	177.6	214.3	5,395.4	8,017.9	14,799.1	139.5	28,351.9	1,451.9	33,157.6	8,121.3	8,645.7	14,938.7
2013	3,358.3	428.2	3,786.5	54.3	196.2	250.5	5,187.5	8,785.8	14,743.7	142.3	28,859.3	1,754.1	34,650.5	8,600.0	9,410.2	14,886.1
2014	3,349.9	369.4	3,719.3	43.6	189.1	232.7	5,177.4	7,543.6	14,712.1	145.8	27,579.0	2,058.9	33,589.9	8,570.8	8,102.2	14,858.0
2015	2,972.2	487.7	3,460.0	25.0	255.1	280.1	5,683.5	7,308.6	14,510.3	143.7	27,646.2	2,917.1	34,303.3	8,680.7	8,051.4	14,654.1

Source: BEIS

Notes:

- (1) Includes coal/petroleum (as appropriate) consumed in all the following sectors: Heat Generation, Energy Industry use, Industry, Public administration, Commercial, Agriculture, Miscellaneous. Excludes petroleum used within the public administration and agriculture sectors and coal used for electricity generation (or other transformation purposes).
- (2) Includes only manufactured solid fuels and not derived gases.
- (3) Excludes bioenergy & waste.

## **Sub-Northern Ireland Final Energy Consumption estimates**

Final energy consumption data are also published by BEIS at District Council Area level: the latest available data is for 2015 and the figures relate to the new 11 super council areas. Data for the years 2005-2014 related to the previous 26 council areas of Northern Ireland.

Table 5.2 overleaf shows that the Mid Ulster council area was responsible for the highest volume of consumption of these fuel types – it accounted for 4,842.2 GWh of consumption or 14% of the Northern Ireland total.

### **Petroleum products**

The Mid Ulster council area was the district council responsible for the largest share of Northern Ireland consumption of petroleum products (at 3,501.0 GWh or 12.7% of total NI consumption), closely followed by Armagh City, Banbridge & Craigavon council area (at 3,336.7 GWh or 12.1% of the total) and both these council areas had more than double the petroleum products consumption than the council area with the lowest consumption of petroleum products in 2015 (i.e. Ards & North Down which had 1,510.0 GWh of consumption or 5.5% of the total).

Looking at the share of petroleum consumption by sector highlights some differences. In 2015 almost two fifths (38%) of petroleum product consumption in Ards & North Down council area was domestic consumption which is around twice the proportion in the Mid Ulster (19%) and Fermanagh & Omagh (20%) council areas. Road transport's share of petroleum consumption is significant in each council area, ranging from around 45% in Mid Ulster to 62% in Lisburn & Castlereagh, with just over half (52%) being the Northern Ireland average. Industry's share of petroleum consumption was significant in the Mid Ulster (36%) and Fermanagh & Omagh (30%) council areas, with much lower proportions in Ards & North Down (10.3%) and Lisburn & Castlereagh (11.7%) council areas.

### **Coal**

While coal represents a much smaller proportion of consumption in overall volume terms, there are also some interesting results to note at a district council level. Firstly, two council areas (Mid Ulster and Derry City & Strabane) together account for over two fifths (42.5%) of all coal consumption in Northern Ireland.

Overall, some 86% of coal consumption in Northern Ireland is by the industrial & commercial sector; however there was some variation at district council level. For example, almost all coal consumed in Mid Ulster (94%) and Derry City & Strabane (92%) was by the industrial & commercial sector whilst in Belfast 71% of coal consumption was due to the industrial & commercial sector (although it is worth noting that the overall volume of coal consumed in Belfast council area was one of the lowest of all council areas at about 158 GWh, or only 4.6% of the Northern Ireland total).

Table 5.2 Northern Ireland Final Energy Consumption by District Council Area (GWh), 2015

Area	Coal <sup>(1)</sup>				Manufactured Fuels <sup>(2)</sup>			Petroleum products <sup>(1)</sup>					Bio energy	All fuels	Consuming Sector <sup>(3)</sup>			Consumption as a % of NI total
	Industrial	Domestic	Rail	Total	Industrial	Domestic	Total	Industrial	Domestic	Road transport	Rail	Total	Total	Total	Industrial	Domestic	Transport	
<b>Antrim &amp; Newtownabbey</b>	232.3	27.1	-	259.3	3.9	15.3	19.2	443.5	547.2	1,299.2	14.0	2,303.9	220.5	2,802.9	679.6	589.5	1,313.3	8%
<b>Ards &amp; North Down</b>	122.8	35.2	-	157.9	0.2	19.6	19.8	155.1	576.6	762.3	16.0	1,510.0	185.4	1,873.1	278.0	631.4	778.3	5%
<b>Armagh City, Banbridge &amp; Craigavon</b>	252.8	61.1	-	313.8	0.2	31.2	31.4	515.4	943.1	1,857.2	21.0	3,336.7	293.5	3,975.4	768.3	1,035.3	1,878.2	12%
<b>Belfast</b>	112.9	45.1	-	158.0	0.2	28.5	28.7	393.4	837.7	1,289.2	33.2	2,553.6	526.2	3,266.5	506.5	911.3	1,322.5	10%
<b>Causeway Coast &amp; Glens</b>	140.8	53.0	0.0	193.8	5.7	26.0	31.7	317.4	682.4	1,375.7	18.0	2,393.5	198.9	2,817.9	463.9	761.4	1,393.8	8%
<b>Derry City &amp; Strabane</b>	532.8	45.3	-	578.1	0.5	22.8	23.3	422.0	635.4	954.3	2.8	2,014.4	200.5	2,816.4	955.3	703.5	957.0	8%
<b>Fermanagh &amp; Omagh</b>	276.9	47.8	-	324.8	0.3	23.1	23.4	851.3	567.4	1,419.8	-	2,838.5	262.8	3,449.4	1,128.5	638.4	1,419.8	10%
<b>Lisburn &amp; Castlereagh</b>	109.6	27.5	-	137.1	0.1	15.5	15.6	217.5	481.2	1,142.8	9.9	1,851.4	173.0	2,177.1	327.3	524.2	1,152.7	6%
<b>Mid and East Antrim</b>	189.3	40.4	-	229.7	0.1	20.9	21.0	444.2	587.8	1,182.3	20.3	2,234.6	229.7	2,715.1	633.6	649.2	1,202.6	8%
<b>Mid Ulster</b>	842.9	50.1	-	893.0	12.0	24.5	36.5	1,259.1	650.5	1,591.3	-	3,501.0	411.7	4,842.2	2,114.0	725.1	1,591.3	14%
<b>Newry, Mourne &amp; Down</b>	159.2	55.1	0.0	214.3	1.8	27.7	29.5	664.6	799.4	1,636.2	8.5	3,108.7	215.0	3,567.4	825.6	882.1	1,644.8	10%
<b>Northern Ireland</b>	2,972.2	487.7	0.1	3,460.0	25.0	255.1	280.1	5,683.5	7,308.6	14,510.3	143.7	27,646.2	2,917.1	34,303.3	8,680.7	8,051.4	14,654.1	100%

Source: BEIS

Notes to table: (1) Includes coal/petroleum (as appropriate) consumed in all the following sectors: Heat Generation, Energy Industry use, Industry, Public administration, Commercial, Agriculture, Miscellaneous. Excludes petroleum used within the public administration and agriculture sectors and coal used for electricity generation (or other transformation purposes). (2) Includes only manufactured solid fuels and not derived gases. (3) Excludes bioenergy & waste.

## Gas

The Utility Regulator is responsible for regulating Northern Ireland's natural gas industry. Similar to the electricity system shown in chapter 3 earlier, the gas system can be divided into three main areas: transmission, distribution and supply<sup>108</sup>.

### Transmission

Gas transmission deals with the large high pressure pipelines that convey gas to the distribution systems. There are four transmission pipelines in Northern Ireland:

1. Scotland to Northern Ireland Pipeline (SNIP) is 135 kilometres long and runs from Twynholm in Scotland to Ballylumford. The SNIP is owned by Premier Transmission Limited which is part of the Mutual Energy Ltd group of companies.
2. Belfast Gas Transmission Pipeline (BGTP) is 26 kilometres long and is connected to the SNIP and to the North West Pipeline. It also supplies gas to the Belfast distribution network. The BGTP is owned by Belfast Gas Transmission Limited (BGTL) which is part of the Mutual Energy Ltd group of companies.
3. North West Pipeline (NWP) is 112 kilometres long and runs from Carrickfergus to Coolkeeragh power station. It is owned by BGE Northern Ireland (BGE NI).
4. South North Pipeline (SNP) is 156 kilometres long and runs from County Antrim to Gormanstown in County Meath, Ireland where it links into the NWP. It is owned by BGE Northern Ireland (BGE NI).

A map of these current main transmission gas pipelines is shown in Annex 5.1.

### Distribution

Gas distribution deals with the medium and low pressure gas mains that convey gas to licensed areas within Northern Ireland and there are currently three distribution areas: Phoenix Natural Gas operates the network in the Greater Belfast area<sup>109</sup>, Firmus Energy operates the network in the 'Ten Towns' area<sup>110</sup> and SGN operates the network in the West of Northern Ireland<sup>111</sup>.

The gas network in Northern Ireland continues to be extended. The first phase of the 'Gas to the West' project to connect Strabane to gas was completed in early 2017. Planning approval on works to connect the remaining towns was awarded in April 2017 and construction on the major pipelines is due to be completed by end 2018/early 2019.

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<sup>108</sup> The information on transmission, distribution and supply was sourced from the Utility Regulator (see <http://www.uregni.gov.uk/gas/>) and <https://www.northernireland.gov.uk/topics/energy/gas>

<sup>109</sup> The Greater Belfast area includes Holywood, Bangor, Newtownards, Belfast, Newtownabbey, Carrickfergus, Lisburn and Larne. In December 2015, the Utility Regulator approved an extension to the Phoenix Natural Gas licence which will provide new gas infrastructure to 13 towns and villages in East Down, including Annahilt, Ballygowan, Ballynahinch, Castlewellan, Crossgar, Downpatrick, Dromore, Drumaness, Dundrum, Hillsborough, Newcastle, Saintfield and The Spa. Work commenced in early 2016 and is due to be completed by end of 2018.

<sup>110</sup> These ten towns being: Londonderry, Limavady, Ballymena, Ballymoney, Coleraine, Newry, Craigavon, Antrim, Banbridge and Armagh. By the end of September 2017, firmus had taken natural gas to some additional urban areas, such as Tandragee, Warrenpoint and Bushmills.

<sup>111</sup> SGN Natural Gas is to provide new high and low pressure gas infrastructure respectively to connect main towns, (including Dungannon, Cookstown, Magherafelt, Coalisland, Omagh, Strabane, and Enniskillen/Derrylin) in the West, to natural gas.

## Supply

Gas supply companies supply customers with gas into their homes/businesses. In the Greater Belfast market, two suppliers are active in supplying gas to domestic and industrial & commercial customers (% of market share by connections in Quarter 4 2017 is shown in brackets): SSE Airtricity (74.0%) and firmus energy (24.6%), and another four suppliers are active in supplying gas only to industrial & commercial customers: Flogas (1.0%), Go Power (0.5%), Vayu (0.012%) and Electric Ireland (0.003%).

In the Ten Towns market, there is currently one supplier active in supplying gas to domestic and industrial & commercial customers (% of market share by connections in Q4 2017 shown in brackets): firmus energy (96.9%) and another five suppliers are active in supplying gas only to industrial & commercial customers: Flogas (1.4%), Go Power (1.0%), SSE Airtricity (0.7%), Electric Ireland (0.008%) and Vayu (0.003%).

In the West, there is one supplier active in supplying gas to both domestic and industrial & commercial customers and one further supplier active in supplying gas only to industrial & commercial customers. Information on connections or consumption in this distribution area have only recently been made available<sup>112</sup>: connection numbers and consumption volumes are small and relate only to Q1 2018.

## Gas Connection

The table below shows the number of connections in each of the two distribution networks split by domestic and Industrial & Commercial (I&C) sectors where available<sup>113</sup>.

Table 5.3 Number of Gas Connections in NI by Distribution Licensed Area, 2012 and 2015-2017

Market Segment	Connections at end of					As a % of total connections in 2017
	2012	...	2015	2016	2017	
<b>Greater Belfast</b>	<b>154,874</b>		<b>186,720</b>	<b>195,437</b>	<b>204,297</b>	84.6
Domestic & Small I&C <sup>114</sup>	-		183,703	192,283	201,109	83.2
I&C 73,200 - 732,000 kWh	-		2,618	2,767	2,789	1.2
I&C > 732,000 - 2,196,000 kWh	-		296	280	299	0.1
I&C > 2,196,000 kWh	-		103	107	100	0.0
<b>Ten Towns</b>	<b>17,277</b>		<b>27,910</b>	<b>32,235</b>	<b>37,293</b>	15.4
Domestic & Small I&C	-		26,771	31,075	36,100	14.9
I&C 73,200 - 732,000 kWh	-		894	911	952	0.4
I&C > 732,000 - 2,196,000 kWh	-		155	158	153	0.1
I&C > 2,196,000 kWh	-		90	91	88	0.0
<b>Total</b>	<b>172,151</b>		<b>214,630</b>	<b>227,672</b>	<b>241,590</b>	<b>100.0</b>

Source: Utility Regulator<sup>115</sup>

<sup>112</sup> See page 34 of Quarterly Transparency Report published 31<sup>st</sup> May 2018 [here](#)

<sup>113</sup> Connections and consumption for domestic and small I&C customers are grouped together (relating to those customers consuming <73,200 kWh/annum).

<sup>114</sup> The domestic and small I&C sector relates to any customers using less than 73,200 kWh per annum.

<sup>115</sup> From Utility Regulator's Transparency Reports – see <https://www.uregni.gov.uk/transparency-reports>



Table 5.3 shows that in 2017 in the Greater Belfast network (operated by Phoenix Natural Gas), over 98% of connections were in the domestic and small I&C sector while the corresponding percentage in the Ten Towns area (operated by Firmus Energy), was similar at 97% at the end of 2017.

Of the over 240,000 total connections to the gas network in 2017, 84.6% are in the Greater Belfast area and the remaining 15.4% in the Ten towns area. The share in overall connections has been changing over time with the Ten towns area taking a larger percentage share of connections each year (up from 10% in 2012 to over 15% in 2017). Those I&C customers with 73,200 kWh or more of consumption and connected to either of the two networks make up 1.8% of total connections in Northern Ireland. However, as Table 5.4 shows below, these customers are responsible for over 55% of total Northern Ireland gas consumption.

Summary data for 2012 has been included in Table 5.3 to highlight the significant increase in gas connections in recent years. Over the five year period 2012 to 2017 the total number of gas connections in Northern Ireland rose substantially, by almost 70,000 or 40%. Over the same period, the rise in the number of connections in the Greater Belfast area was around 50,000 (32%) whilst connections in the Ten towns area more than doubled (a rise of over 20,000 or 116%).

Table 5.3 above clearly shows that the total number of gas connections in Northern Ireland continues to rise each year although rises were not seen in all categories. For the largest gas consumers, connections have remained stable or shown small declines.

## Consumption

Table 5.4 Annual Gas Consumption (GWh) in NI by Distribution Licensed Area, 2012 and 2015-2017

Market Segment	Consumption (GWh) during					As a % of total consumption in 2017
	2012	...	2015	2016	2017	
<b>Greater Belfast</b>	<b>3,805</b>		<b>4,069</b>	<b>4,160</b>	<b>4,248</b>	71%
Domestic & Small I&C	1,776		2,095	2,232	2,319	39%
I&C 73,200 - 732,000 kWh	571		581	586	607	10%
I&C > 732,000 - 2,196,000 kWh	352		334	316	307	5%
I&C > 2,196,000 kWh	1,106		1,059	1,026	1,015	17%
<b>Ten Towns</b>	<b>1,467</b>		<b>1,747</b>	<b>1,774</b>	1,700	29%
Domestic & Small I&C	123		236	275	330	6%
I&C 73,200 - 732,000 kWh	141		226	241	235	4%
I&C > 732,000 - 2,196,000 kWh	151		170	180	180	3%
I&C > 2,196,000 kWh	1,052		1,115	1,078	956	16%
<b>Total</b>	<b>5,272</b>		<b>5,816</b>	<b>5,935</b>	<b>5,948</b>	<b>100%</b>

Source: Utility Regulator<sup>116</sup>

<sup>116</sup> Data for this table is derived from Utility Regulator's Transparency Reports (see [here](#)). 2015 data has been converted from therms to GWh using the conversion factor 1 therm = 0.0000293071 GWh. 2017 data is calculated from the four Quarterly Transparency Reports for 2017.

As shown above total gas consumption in the domestic and I&C sectors in Northern Ireland was 5,948 GWh in 2017. Around 70% of total consumption in 2017 was in the Greater Belfast network area with about 30% in the Ten towns licensed area. Over the period 2015-2017, there was a slight rise in total consumption (an increase of over 132 GWh or 2.3%). However, consumption was flat over the period 2016-2017 even though, as shown in Table 5.3 earlier, there was an increase of around 14,000 in the number of connections over this period.

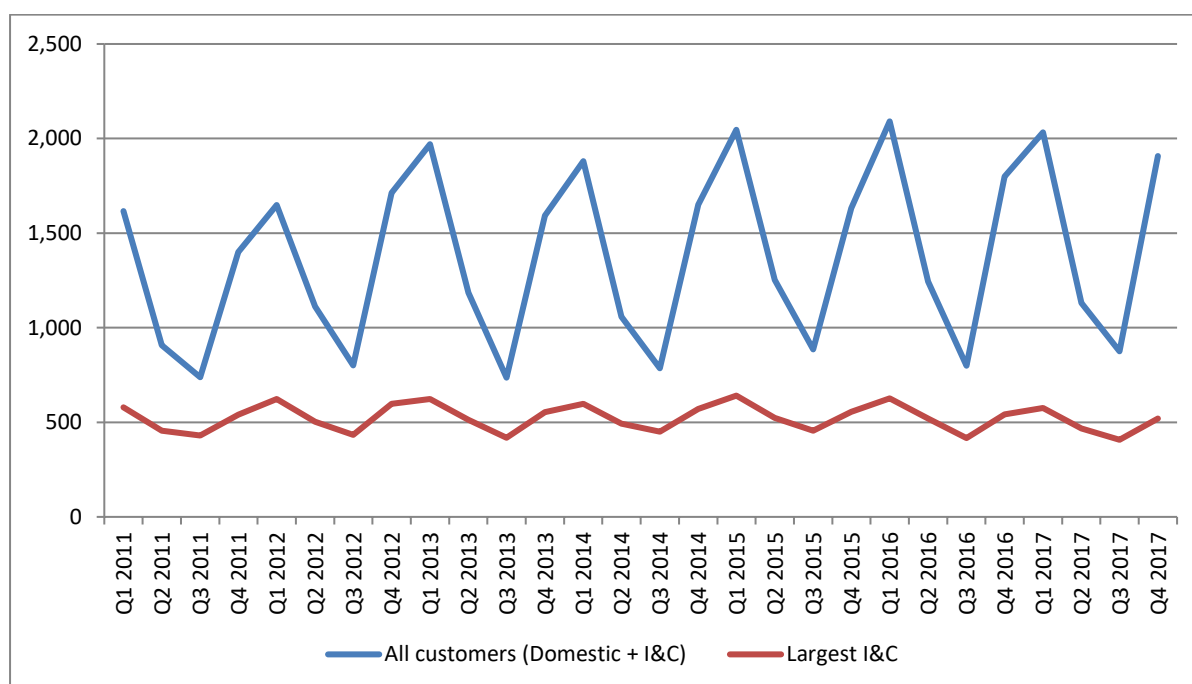
Table 5.4 above shows that consumption in the Ten Towns area fell by 4% between 2016 and 2017 whilst there was a 2% rise in consumption in the Greater Belfast area. In both areas domestic and small I&C consumption rose, particularly in the Ten Towns area (up 20% between 2016 and 2017). However, an 11% drop in consumption in the largest consuming group in the Ten Towns area led to an overall fall in that area.

The relatively small number of the biggest industrial and commercial customers (I&C > 2,196,000 kWh) accounted for around one-third of consumption in 2017. Table 5.3 earlier showed there were only 188 such companies, which represents less than 0.1% of all connections.

### Quarterly Data

Like electricity consumption (shown in Chart 3.1 earlier), gas consumption is seasonal and varies considerably over the year as shown in Chart 5.1 below.

Chart 5.1 Quarterly Total Gas Consumption in Northern Ireland (GWh), Q1 2011 – Q4 2017



Source: Utility Regulator

Overall consumption (i.e. domestic plus I&C) is considerably lower over the second and third quarters of the year (during the spring and summer months), and peaks during the winter months (i.e. in Q1 and Q4). Such trends are to be expected given that gas will be used by customers as the main fuel for heating purposes.

The chart also shows consumption for the largest Industrial & Commercial (I&C) customers – i.e. the 188 largest consuming I&C customers (who consume >2,196,000 kWh per year). This shows that, whilst there is indeed some seasonal change in consumption among this group, it is less marked than the quarterly changes for all customers (both domestic and I&C).

For example, the average change from Q3 to Q4 for the largest I&C group over the period shown was an increase of around 29%, whereas for all customers the average increase from Q3 to Q4 was over 100% (i.e. on average gas consumption for all customers in Q4 is more than twice consumption in Q3). This would suggest that gas consumption for the largest I&C customers is not as dependent on weather conditions but rather that gas consumption for these customers is based on their requirements for gas for industrial processing.

## Total Energy Consumption for Northern Ireland – amalgamation of sources

The following table provides information on total energy consumption<sup>117</sup> in Northern Ireland using an amalgamation of sources already presented in this report, namely: BEIS total final energy consumption data<sup>118</sup> (which excludes electricity and gas for NI), electricity consumption data (published by DfE and sourced from NIE Networks<sup>119</sup>) and gas consumption data (sourced from the Utility Regulator).

Table 5.5 Total Energy Consumption in Northern Ireland (GWh), 2011 - 2015

	2011	2012	2013	2014	2015
Electricity	8,235	8,095	8,181	8,022	7,819
Gas	<u>4,661</u>	<u>5,274</u>	<u>5,484</u>	<u>5,374</u>	<u>5,817</u>
Total Electricity and Gas	12,895	13,369	13,665	13,397	13,636
Plus BEIS final energy consumption (excluding electricity and gas)	34,390	33,158	34,650	33,590	34,303
<b>Equals Total Energy Consumption in Northern Ireland</b>	<b>47,285</b>	<b>46,527</b>	<b>48,315</b>	<b>46,986</b>	<b>47,939</b>
Total Energy Consumption in GB <sup>120</sup>	1,450,114	1,445,682	1,442,025	1,450,035	1,440,020
NI as a % of GB	3.3%	3.2%	3.4%	3.2%	3.3%

Source: NIE Networks, Utility Regulator, BEIS

Table 5.5 shows that some 47,939 GWh of energy was consumed in Northern Ireland in 2015 (13,636 GWh from electricity and gas and 34,303 GWh from other fuels). This was equivalent to 3.3% of the total energy consumption in GB for the same year.

Over the five year period shown, total energy consumption was highest in 2013 in Northern Ireland though overall consumption has been fairly steady over the period with small annual changes of between 2-4%. Total consumption in GB has also been fairly stable and annual changes were less than 1% over the period shown. Northern Ireland energy consumption as a proportion of GB consumption has been fairly steady (at just over 3%) in each year 2011 to 2015.

The table also shows that gas consumption has increased by 25% over the period shown, more than offsetting the 5% fall in electricity consumption over the period. The overall 2% rise in total consumption between 2014 and 2015 was made up of a fall in electricity consumption (-3%), a small rise in other fuels (2%) and an 8% rise in gas consumption.

<sup>117</sup> This excludes any gas or coal consumption by power stations in Northern Ireland as this fuel is used to generate electricity which is then included in the electricity consumption figures here. Also, as noted earlier, energy consumption by aviation (air transport) and shipping (national navigation) are excluded from the BEIS total final energy consumption data.

<sup>118</sup> As presented in Table 5.1 earlier, rounded to nearest GWh.

<sup>119</sup> See Chart 3.2 in Chapter 3 of this report.

<sup>120</sup> See [here](#) for full spreadsheets. GB total includes a small amount of unallocated consumption (i.e. consumption that could not be allocated to any particular UK region).

## Coal

NISRA produce data on coal imports into Northern Ireland, which includes information on the amount of coal imported for use by power plants in the generation of electricity. The figures in Table 5.6 are inclusive of all sources of coal shipped (bulk cargo and containerised) to Northern Ireland including cross channel and foreign imports.

Table 5.6 Shipments of Coal and Other Solid Fuels<sup>121</sup> into Northern Ireland (Thousand Tonnes) by type of use<sup>122</sup>, 2007-2017

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Domestic Use	483	462	358	402	432	346	674	502	811	744	873
Industrial Use	165	339	190	172	299	348	360	506			
Generation of Electricity	782	746	508	778	588	1,021	1,047	937	836	926	609
All Shipments	1,430	1,547	1,055	1,351	1,320	1,716	2,081	1,946	1,647	1,670	1,483
% of imports used for Electricity Generation	55%	48%	48%	58%	45%	59%	50%	48%	51%	55%	41%

Source: Annual Coal Inquiry, NISRA

Just over two fifths (41%) of coal imported into Northern Ireland in 2017 was for generation of electricity (as noted in Chapter 3, Kilroot power station in Carrickfergus is mainly coal fuelled). This proportion has fallen compared to ten years ago (55% in 2007), though it can fluctuate from year to year.

Coal imported for domestic use typically accounted for between one quarter and one third of all imports between 2007 and 2014. Coal shipments into Northern Ireland for industrial use grew from around 10% in 2007 to over 20% in the period 2011-2014 and indeed this had increased to over one quarter (26%) for 2014. In 2012 and 2014 the volume of coal imported for industrial use was slightly above the level of coal imported for domestic use. In the period 2007-2010 around two times as much coal was shipped into Northern Ireland for domestic use as for industrial use. Unfortunately, the split between domestic and industrial use is not available after 2014 so more recent trends in this respect cannot be determined.

Coal imports for the purpose of generating electricity in 2017 (609,000 tonnes) were at their lowest level since 2011 and showed a substantial decrease over the year (down 34% from 926,000 tonnes in 2016 to 609,000 tonnes in 2017).

<sup>121</sup> Covers all types of solid fuels including coal, anthracite, lignite, coke and manufactured smokeless fuels.

<sup>122</sup> Separate totals for 'Domestic Use' and 'Industrial Use' are not available beyond 2014.

## Road Transport Energy Consumption

BEIS produce a range of data on road transport energy consumption at Northern Ireland level and also at District Council level. These detail the amount of petrol and diesel used and data are available split by vehicle type (buses, cars, HGV etc.) and by use (personal or freight)<sup>123</sup>.

Between 2007 and 2015, the amount of diesel and petrol consumed in Northern Ireland due to road transport fell by around 10% (a fall of over 132,500 tonnes of oil equivalent) to about 1.25 million tonnes of oil equivalent. Of this fall around 65,000 tonnes was due to falls in personal consumption (i.e. buses, cars and motorcycles) and around 67,500 tonnes due to falls in freight transport consumption (i.e. Heavy Goods Vehicles (HGV) and Large Goods Vehicles (LGV)).

Interestingly, consumption by diesel cars in Northern Ireland has risen considerably (by around 67,000 tonnes of oil equivalent or 15%) over the period 2007-2015 whilst consumption by petrol cars has fallen by around one quarter over the same period (by around 134,000 tonnes of oil equivalent or 24%). In 2007 consumption by diesel cars was over 20% lower than the volume of petrol car consumption (with a difference of around 120,000 tonnes) but this difference then decreased year on year and, by 2012, consumption by diesel cars was higher than consumption by petrol cars. Indeed, in 2015, diesel car consumption was over 19% higher than petrol car consumption with the percentage difference seen in 2007 having been reversed.

Overall, in each year about three quarters of all diesel and petrol road transport consumption is due to personal use (i.e. consumption by buses, cars and motorcycles) while the remaining quarter is due to freight transport consumption (i.e. consumption by HGVs and LGVs).

## Comparisons with Great Britain

Table 5.7 also shows GB proportions for comparative purposes and there are some significant differences. Except for buses, in GB a higher proportion of consumption takes place on motorways and a lower proportion of consumption is due to transport on minor roads. This is perhaps to be expected given that the proportion of the road network in GB that is motorway is about twice that of Northern Ireland (around 0.9%<sup>124</sup> in 2015 compared to 0.45%<sup>125</sup> in 2015 in Northern Ireland).

Only about 8% of diesel and petrol car consumption in Northern Ireland in 2015 was due to the use of such vehicles on motorways, while in GB the proportions are 23% and 14% respectively. The use of diesel cars on A-roads is similar in GB and NI (42% and 46% respectively) but use of diesel cars on minor roads in NI accounts for close to half of consumption (46%) for these vehicles whereas in GB it is just over one third (35%).

In the freight sector this tendency is also apparent, though the differences are even more marked. In Northern Ireland in 2015, only 10% of fuel consumption by HGVs and 7% of fuel consumption by LGVs was due to driving by such vehicles on motorways compared to 44% and 21% in GB respectively. The use of HGVs on A-roads is fairly similar in GB (45%) and NI (52%) but this means the proportion of consumption by HGVs on minor roads is much higher in Northern Ireland (38%) than it is in GB (11%).

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<sup>123</sup> See pages 51-55 of the BEIS methodology booklet for more details on these datasets ([link here](#)).

<sup>124</sup> Taken from Road Lengths in Great Britain: 2015 (see [link here](#)).

<sup>125</sup> Taken from Table 3.1 of Northern Ireland Transport Statistics 2014-15 (see [link here](#)).

Table 5.7 Northern Ireland Road Transport Energy Consumption (Tonnes of oil equivalent), 2007-2015

	Personal												Freight							
	Buses				Diesel Cars				Petrol Cars & Motorcycles <sup>126</sup>				HGV				Diesel and Petrol LGV <sup>127</sup>			
	Motor ways	A roads	Minor roads	Total	Motor ways	A roads	Minor roads	Total	Motor ways	A roads	Minor roads	Total	Motor ways	A roads	Minor roads	Total	Motor ways	A roads	Minor roads	Total
2007	1,367	6,669	3,005	11,041	30,228	199,401	212,868	442,497	38,038	259,596	264,128	561,761	36,667	144,665	88,907	270,239	8,410	51,806	34,445	94,660
2008	1,136	5,868	3,151	10,156	31,333	203,414	221,197	455,945	37,932	255,071	250,708	543,711	27,820	127,037	103,889	258,746	8,352	38,588	45,390	92,330
2009	2,083	6,421	2,929	11,433	35,289	207,097	236,518	478,905	40,627	247,071	253,109	540,807	20,642	121,051	94,911	236,604	5,501	41,551	37,610	84,662
2010	1,961	5,722	1,928	9,611	35,823	210,050	233,728	479,601	38,667	234,794	241,232	514,692	20,424	116,906	92,696	230,026	5,396	37,008	33,444	75,847
2011	1,964	5,791	4,129	11,885	37,167	217,470	232,375	487,011	37,985	230,030	231,066	499,081	20,857	118,535	79,972	219,364	5,720	39,360	33,918	78,998
2012	2,081	6,133	3,543	11,758	37,539	220,571	227,936	486,045	36,164	219,648	223,598	479,410	21,017	110,340	80,102	211,459	5,468	36,204	33,413	75,085
2013	2,119	7,492	3,661	13,272	37,185	215,601	227,152	479,938	35,976	215,493	222,175	473,645	20,765	111,260	81,689	213,714	5,397	37,002	35,161	77,561
2014	2,237	7,637	3,674	13,548	38,218	223,707	238,852	500,777	33,682	203,499	208,020	445,201	22,676	110,276	88,926	221,877	6,216	39,953	35,728	81,897
2015	2,184	7,590	3,514	13,289	40,964	234,008	234,528	509,500	33,490	197,122	197,010	427,623	22,552	115,863	83,855	222,269	5,568	41,970	27,444	74,982
NI % 2015	16%	57%	26%	100%	8%	46%	46%	100%	8%	46%	46%	100%	10%	52%	38%	100%	7%	56%	37%	100%
GB % 2015	7%	46%	47%	100%	23%	42%	35%	100%	14%	45%	41%	100%	44%	45%	11%	100%	21%	43%	35%	100%

	Total			% of Total		
	Personal	Freight	Total	Personal	Freight	Total
2007	1,015,299	364,899	1,380,198	74%	26%	100%
2008	1,009,812	351,076	1,360,888	74%	26%	100%
2009	1,031,145	321,266	1,352,411	76%	24%	100%
2010	1,003,904	305,873	1,309,777	77%	23%	100%
2011	997,977	298,362	1,296,339	77%	23%	100%
2012	977,213	286,545	1,263,757	77%	23%	100%
2013	966,855	291,275	1,258,129	77%	23%	100%
2014	959,526	303,774	1,263,300	76%	24%	100%
2015	950,412	297,251	1,247,663	76%	24%	100%
GB 2015	24,126,364	12,257,643	36,384,007	66%	34%	100%

Source: BEIS

<sup>126</sup> Petrol cars account for over 99% of consumption in this category.

<sup>127</sup> Diesel LGV accounts for over 96% of consumption in this category. LGVs can be used for a number of tasks (carrying freight, providing transport or for private use) so not all LGV traffic is freight transport.

## **Sub-national Road Transport Energy Consumption**

BEIS also publish road transport consumption data at a District Council level for the new 11 council areas and data for the most recent year (2015) is shown in Table 5.8 overleaf.

The council area with the highest consumption (for both personal and freight consumption) is Armagh City, Banbridge & Craigavon with about 160,000 tonnes of consumption or 13% of the total. The three biggest consuming District Councils (Armagh City, Banbridge & Craigavon, Mid Ulster and Newry, Mourne & Down) together accounted for over one third (35%) of total Northern Ireland petrol and diesel consumption for road transport use in 2015.

### **Buses**

Consumption of diesel<sup>128</sup> by buses is highest in Belfast council area with a significant share accounted for by Belfast and surrounding District Council areas. Three of the eleven council areas (i.e. Belfast, Lisburn & Castlereagh and Antrim & Newtownabbey) together accounted for around two fifths (37%) of diesel consumption by buses in 2015, with Belfast on its own accounting for over 16% of such consumption.

### **Cars**

Armagh City, Banbridge & Craigavon District Council was the top consuming council in terms of petrol and diesel use by cars, accounting for about 13% of total Northern Ireland consumption in 2015. In addition, it is other council areas outside the Greater Belfast area that then make up the other highest consuming council areas, namely Newry, Mourne & Down (11%), Mid Ulster (10%), Fermanagh & Omagh (10%) and Causeway Coast & Glens (10%). Together these five council areas account for over half (54%) of all petrol and diesel use by cars.

### **HGV**

In terms of diesel use by Heavy Goods Vehicles (HGVs), again Armagh City, Banbridge & Craigavon District Council area had the largest share (at 13.5% or just over 30,000 tonnes of oil equivalent), followed closely by Mid Ulster (13.1% or just over 29,000 tonnes of oil equivalent), with these two councils together accounting for over one quarter (26.6%) of HGV diesel use in Northern Ireland in 2015.

### **Consumption by use**

Overall, some three quarters (76%) of all petrol and diesel fuel consumed for road transport purposes in Northern Ireland in 2015 was for personal use with about one quarter (24%) used by freight. At a council level there was some variation in the split between personal use and freight use. In Belfast and Ards & North Down council areas between 82-84% of petrol and diesel used was for personal use whilst in council areas like Mid Ulster and Mid and East Antrim the percentage of petrol and diesel used for personal use was lower than average, at around 72-73%. In most council areas though, the personal/freight consumption split was very close to the Northern Ireland average.

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<sup>128</sup> Petrol cars, motorcycles and petrol LGV are petrol consuming vehicles, while buses, diesel cars, HGV and diesel LGV are diesel consuming vehicles.



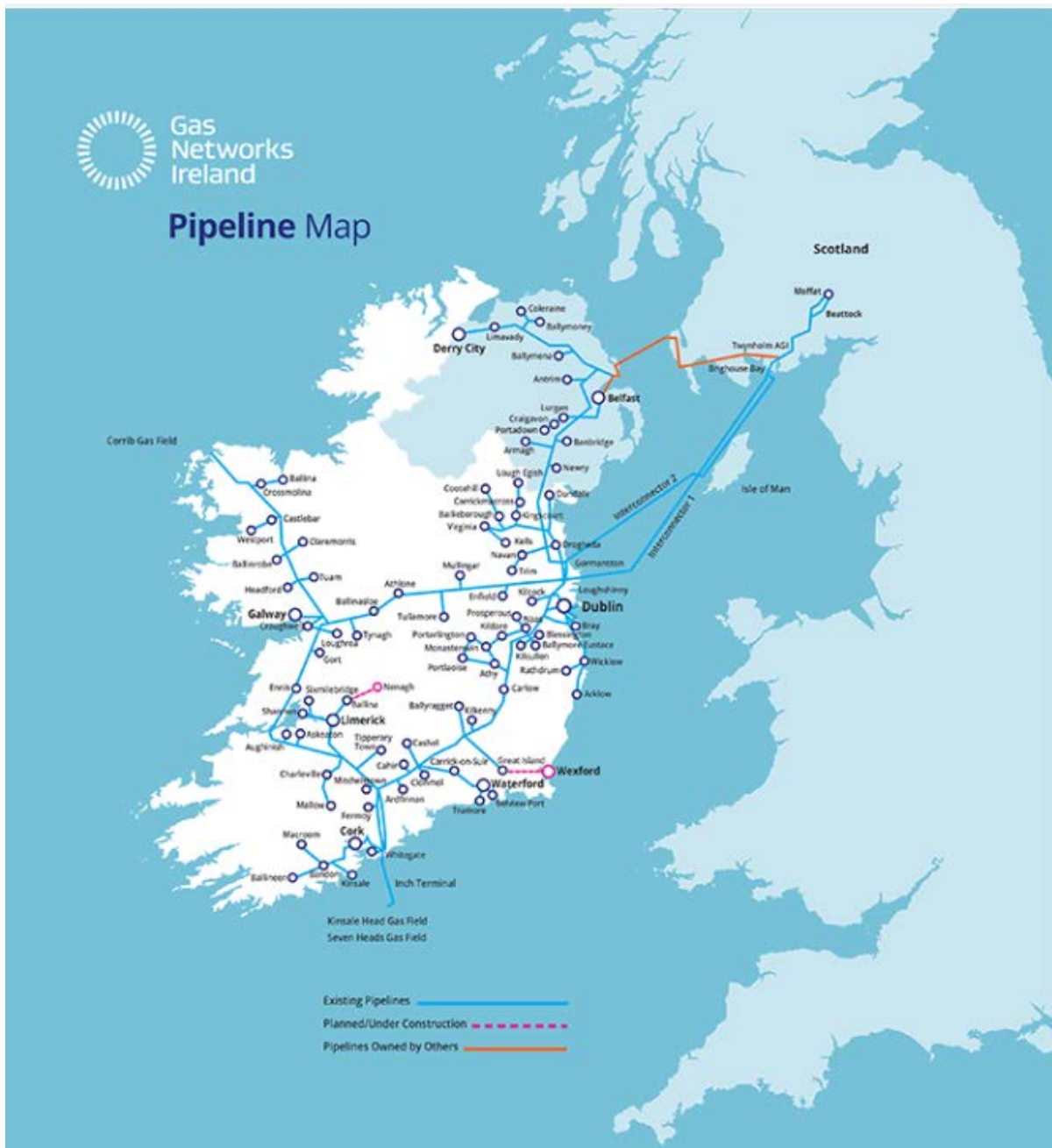
Table 5.8 Road transport energy consumption at District Council level (tonnes of oil equivalent), 2015

District Council Area	Personal				Freight			Personal	Freight	Total
	Buses	Diesel Cars	Petrol Cars	Motorcycles	HGV	Diesel LGV	Petrol LGV			
Antrim and Newtownabbey	1,846	44,714	36,908	347	22,013	5,673	212	83,814	27,897	111,712
Ards and North Down	768	29,221	24,657	192	7,218	3,350	137	54,839	10,705	65,544
Armagh City, Banbridge and Craigavon	1,743	64,368	53,474	423	30,040	9,290	356	120,008	39,686	159,693
Belfast	2,152	47,270	40,556	510	15,901	4,272	193	90,488	20,365	110,853
Causeway Coast and Glens	918	49,468	40,954	246	19,963	6,494	250	91,586	26,707	118,293
Derry City and Strabane	714	34,334	28,728	235	13,991	3,894	157	64,010	18,042	82,052
Fermanagh and Omagh	1,103	50,016	41,541	249	22,476	6,438	254	92,909	29,168	122,077
Lisburn and Castlereagh	935	38,958	32,335	297	19,977	5,546	215	72,524	25,737	98,262
Mid and East Antrim	568	40,203	33,613	244	18,922	7,795	310	74,629	27,027	101,656
Mid Ulster	1,291	53,195	43,834	258	29,092	8,833	327	98,579	38,252	136,830
Newry, Mourne and Down	1,251	57,754	47,737	285	22,679	10,585	402	107,026	33,665	140,691
Northern Ireland	13,289	509,500	424,339	3,284	222,269	72,170	2,811	950,412	297,251	1,247,663

Source: BEIS

[Please note that LGVs can be used for a number of tasks such as carrying freight, providing transport, carrying equipment or for private use, meaning that not all LGV traffic is related to freight transportation.]

Annex 5.1 Map of existing transmission gas pipelines



Source: Gas Networks Ireland<sup>129</sup>

Further maps showing the distribution system in Northern Ireland (including the Gas to the West pipelines) can be found in <http://gmo-ni.com/assets/documents/Northern-Ireland-Gas-Capacity-Statement-2017-18-to-2026-27-0000002.pdf>

<sup>129</sup> See <http://www.gasnetworks.ie/en-IE/About-Us/Our-network/Pipeline-Map/>

## Chapter 6: Energy and the Consumer

### Summary of key points

#### Household expenditure on energy

- Northern Ireland had the highest weekly household expenditure on energy of any UK region; it was some 18% higher in the period 2014-2017 than the UK average. However, the gap has narrowed considerably in recent years (from 36% in the period 2012-2014).
- Weekly household expenditure on electricity was highest in Northern Ireland in the period 2014-2017, 16% higher than the UK average and 29% above the UK region with the lowest expenditure.
- Weekly expenditure on gas in Northern Ireland was less than a third of the UK average expenditure but households in Northern Ireland spent about 9 times as much per week on other fuels (e.g. home heating oil) compared to the UK as a whole in the period 2014-2017.
- In 2017, for domestic electricity customers, Northern Ireland had the lowest unit cost and lowest annual bill of all UK regions with these being some 11% below the UK average.
- Domestic electricity prices for Northern Ireland in July-December 2017 were 20% below the EU 15 average (median) figure and lower than 14 of the 15 EU countries.
- In the last six months of 2017, domestic gas prices in Northern Ireland were some 36% lower than the EU15 median price and only one EU15 country (Luxembourg) had a lower tariff.

#### Non-domestic expenditure on energy

- In Quarter 4 2017, Northern Ireland non-domestic electricity prices were around 9% lower than the UK in the very small category and 1% lower in the small category; they were 1% higher in the small/medium category, but 12% lower in the medium category and around 24% lower than the UK in the large/very large category.
- Northern Ireland non-domestic electricity prices were above the EU median price in all but one category, the very small category, where NI prices were 14% below the EU median. Northern Ireland prices were substantially above the EU median price in the small/medium category (22% higher), the medium category (15% higher) and in the large/very large category (30% higher) in Quarter 4 2017 though this gap has narrowed in recent years.

#### Road fuel prices

- Diesel prices in Northern Ireland at the start of 2018 were the lowest of any UK region and petrol prices in Northern Ireland were the second lowest of all UK regions.
- Diesel and petrol prices in early 2018 were significantly higher than the prices for such fuels in early 2007 (34% and 39% higher respectively).

## Introduction

This chapter looks at energy from the consumer perspective including household expenditure on energy, electricity prices and road fuel prices. Comparisons with other regions are provided where possible.

### Household Expenditure on Energy

The Office for National Statistics' Living Costs and Food Survey provides data on the amount of weekly household expenditure on electricity, gas and other fuels. This is presented in Table 6.1 below.

Table 6.1 Weekly household expenditure (£) by UK countries and regions, 2014-2017<sup>130</sup>

Region	Electricity	Gas	Other fuels	Total weekly expenditure on energy	Total weekly expenditure (on all commodities and services)	Expenditure on energy as a % of total weekly expenditure
North East	10.30	11.70	0.20	22.30	437.00	5.1%
North West	11.60	12.10	0.50	24.20	492.40	4.9%
Yorkshire & the Humber	10.70	11.40	0.70	22.70	489.70	4.6%
East Midlands	11.10	10.60	1.20	22.90	530.80	4.3%
West Midlands	11.10	11.40	0.80	23.30	472.20	4.9%
East	11.10	10.20	1.50	22.70	558.10	4.1%
London	11.50	12.20	0.10	23.80	643.70	3.7%
South East	11.50	11.00	1.30	23.80	632.20	3.8%
South West	11.60	9.30	1.70	22.60	535.50	4.2%
England	11.30	11.10	0.90	23.30	547.40	4.3%
Wales	12.00	10.80	1.90	24.70	458.70	5.4%
Scotland	12.70	10.60	1.60	24.90	492.30	5.1%
<b>Northern Ireland</b>	<b>13.30</b>	<b>3.40</b>	<b>11.10</b>	<b>27.80</b>	<b>497.10</b>	<b>5.6%</b>
United Kingdom	11.50	10.80	1.30	23.60	536.80	4.4%

Source: Office for National Statistics (ONS) Living Costs and Food Survey<sup>131</sup>

The table above highlights a number of differences in expenditure on energy in Northern Ireland compared to other UK regions. Firstly, Northern Ireland had the highest weekly expenditure on energy of any UK region. Weekly household expenditure on energy in Northern Ireland was some 18% higher (at £27.80 per week in the period 2014-2017) compared to the UK average of £23.60.

<sup>130</sup> Figures are for financial year ending 2015 to financial year ending 2017.

<sup>131</sup> Detailed household expenditure by UK countries and regions spreadsheets are available [here](#)

Weekly household expenditure on electricity was highest in Northern Ireland (at £13.30), 16% higher than the UK average and 29% more than the UK region with the lowest expenditure on electricity (North East). Compared to 2012-14, as shown in the previous Energy in Northern Ireland report<sup>132</sup>, every region was spending less on energy in the period 2014-17. The largest proportional fall was seen in Northern Ireland where weekly household expenditure on energy fell by around £7 or 19%. Whilst weekly expenditure on energy in Northern Ireland was 5.6% of total weekly expenditure in the period 2014-2017 and the highest of any region, this percentage has fallen considerably since 2012-2014 where it stood at 7.1%.

As the table above shows, expenditure on Gas and 'Other fuels' in Northern Ireland is very different from any other region of the UK. For example, weekly spending on gas in NI is less than a third of the UK average expenditure and households in Northern Ireland spend around 9 times as much per week on other fuels compared to the UK as a whole.

The main reasons for such differences are the availability of mains gas and, consequently, the propensity for oil use for home heating purposes. Unlike Northern Ireland, mains gas is widely available throughout GB and this means it is the main type of central heating at the UK level with some 85% of UK households in 2018 having gas central heating installed and only 5% using oil central heating<sup>133</sup> (see Table 6.2 below).

In contrast, according to the Northern Ireland Housing Executive's House Conditions Survey<sup>134</sup>, in 2016 around 24% of households with central heating in Northern Ireland used gas as their primary central heating fuel and some 68% of households relied on oil for domestic central heating purposes. However, it is worth noting that the proportion of dwellings in Northern Ireland with gas central heating has risen from 4% in 2001 and 17% in 2011. Also, the Belfast Metropolitan Area (BMA) accounted for almost half of all dwellings that use gas for central heating in Northern Ireland and over three-fifths (around 89,500 or 62%) of all dwellings in the BMA had gas central heating. The vast majority of all gas-heated dwellings are located in urban areas (98% in 2016) reflecting the extent of the gas network.

Household expenditure data for the Republic of Ireland shows a spending profile on energy that is more closely aligned with that in Northern Ireland although gas central heating is much more prevalent in the Republic of Ireland than in Northern Ireland (around 35% of households in the Republic of Ireland in 2016 had gas<sup>135</sup> central heating and 41% used oil fired central heating). Similar to NI, a much higher than average proportion of households in the main urban areas in the Republic of Ireland are gas-heated dwellings: 52% of households in town areas have gas central heating compared to only 3% in rural areas. Oil use in rural areas in the Republic of Ireland, at 66%, is similar to the overall proportion for Northern Ireland<sup>136</sup>.

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<sup>132</sup> See page 89 of <https://www.economy-ni.gov.uk/publications/energy-northern-ireland-2016>

<sup>133</sup> Data is taken from Wave 25 of BEIS's Energy and Climate Change Public Attitudes Tracker (link [here](#))

<sup>134</sup> See 2016 data available at [https://www.nihe.gov.uk/index/corporate/housing\\_research/house\\_condition\\_survey.htm](https://www.nihe.gov.uk/index/corporate/housing_research/house_condition_survey.htm), in particular Table 7.4.

<sup>135</sup> This includes natural gas and LPG gas.

<sup>136</sup> All data for the Republic of Ireland is taken from the 2016 Census, available on the CSO website (link to report [here](#) and data tables [here](#))

Table 6.2 Comparison of energy expenditure and central heating type by country – NI, UK, ROI

Region	Proportion of weekly energy expenditure that is spent on:			Proportion of households with central heating that is:		
	Electricity	Gas	Other fuels	Oil	Gas	Other
<b>Northern Ireland</b>	<b>48%</b>	<b>12%</b>	<b>40%</b>	<b>68%</b>	<b>24%</b>	<b>8%</b>
UK	49%	46%	6%	5%	85%	11%
Republic of Ireland	47%	19%	34%	41%	35%	24%

Sources: ONS, CSO, NIHE

In terms of weekly expenditure, Table 6.2 above shows that only 12% of weekly energy expenditure in Northern Ireland was on gas, compared to almost half (46%) for the UK as a whole. Some two-fifths (51%) of all weekly energy expenditure in Northern Ireland was on ‘other fuels’ such as home heating oil, coal etc., compared to only 6% for the UK as a whole. In the Republic of Ireland<sup>137</sup>, one third (34%) of all weekly energy expenditure was on ‘other fuels’, still lower than the equivalent proportion for Northern Ireland but almost six times that for the UK as a whole. Similarly, expenditure on gas accounted for 19% of all weekly energy spend in the Republic of Ireland, much higher than the proportion for Northern Ireland (12%) but less than half the proportion for the UK.

### Electricity Prices – Domestic Customers

The table below shows that in 2017, for domestic customers, Northern Ireland had the lowest average unit cost and, consequently (based on calculating annual bills on an annual consumption figure of 3,800kWh/year), the lowest average annual electricity bill of all 15 UK regions for Credit, Direct Debit and Prepayment customers. This is a significant change since the previous Energy in Northern Ireland report<sup>138</sup>, which showed data for 2015, where Northern Ireland had the highest unit costs for Direct Debit customers and the third highest overall unit costs of any UK region.

<sup>137</sup> The most recent data on average weekly household expenditure for the Republic of Ireland refers to 2015-16 and is taken from the Central Statistics Office’s Household Budget Survey – see [here](#) for data tables

<sup>138</sup> See page 91 of <https://www.economy-ni.gov.uk/publications/energy-northern-ireland-2016>

Table 6.3: Average annual domestic standard electricity bills in 2017 for UK regions based on consumption of 3,800kWh/year: Unit cost (Pence per kWh), Bill (£) and Rank

Payment type	Credit			Direct debit			Prepayment			Overall		
Region	Unit cost	Bill	Rank	Unit cost	Bill	Rank	Unit cost	Bill	Rank	Unit cost	Bill	Rank
East Midlands	17.08	649	14	15.31	582	13	16.01	608	13	15.80	601	14
Eastern	17.32	658	13	15.48	588	12	16.19	615	10	16.00	608	12
London	17.69	672	8	15.91	605	6	15.91	604	14	16.49	626	6
Merseyside & North Wales	18.73	712	3	16.75	636	3	17.25	656	3	17.25	656	3
North East	17.68	672	9	15.69	596	9	16.40	623	7	16.24	617	7
North Scotland	18.92	719	1	17.10	650	1	17.73	674	1	17.59	669	1
North West	17.55	667	10	15.71	597	8	16.27	618	9	16.22	616	9
<b>Northern Ireland</b>	<b>14.69</b>	<b>558</b>	<b>15</b>	<b>14.45</b>	<b>549</b>	<b>15</b>	<b>14.41</b>	<b>548</b>	<b>15</b>	<b>14.48</b>	<b>550</b>	<b>15</b>
South East	17.93	681	5	16.08	611	5	16.59	630	5	16.53	628	5
South Scotland	17.34	659	12	15.54	591	11	16.16	614	11	16.03	609	11
South Wales	18.34	697	4	16.56	629	4	16.98	645	4	17.02	647	4
South West	18.84	716	2	16.95	644	2	17.39	661	2	17.41	662	2
Southern	17.70	673	6	15.78	599	7	16.43	624	6	16.23	617	8
West Midlands	17.69	672	7	15.64	594	10	16.34	621	8	16.22	616	10
Yorkshire	17.39	661	11	15.28	581	14	16.04	609	12	15.89	604	13
UK	17.63	670	-	15.81	601	-	16.28	619	-	16.30	619	-

Source: BEIS<sup>139</sup> (See Annex 6.1 for notes to this table)

Overall (i.e. taking into account all three payment methods) Northern Ireland had the lowest unit cost and annual bill, with these being some 11.1% below the UK average and some 17.7% below the region with the highest unit cost and annual bill (i.e. North Scotland). The overall annual average bill, based on consumption of 3,800kWh/year, for domestic customers in Northern Ireland is around £120 lower than in the most expensive UK region and some £70 below the UK average.

Historically in NI, electricity prices have been higher than in GB. This was considered to be due to various factors including higher energy transport costs, small size of the market that reduces chances of economies of scale and difference in fuel mix.<sup>140</sup> However in 2016, and for the first time, overall annual unit costs in Northern Ireland were below the UK average<sup>141</sup> and this has continued into 2017 where, as noted above, unit costs and average annual bills for Northern Ireland domestic customers were significantly below UK average rates.

<sup>139</sup> See <https://www.gov.uk/government/collections/domestic-energy-prices>

<sup>140</sup> See page 17 of <https://www.uregni.gov.uk/sites/uregni/files/media-files/February%202015.pdf>

<sup>141</sup> As per information on annual domestic electricity bills from BEIS (see tables [here](#)). Data is available back to 1998.

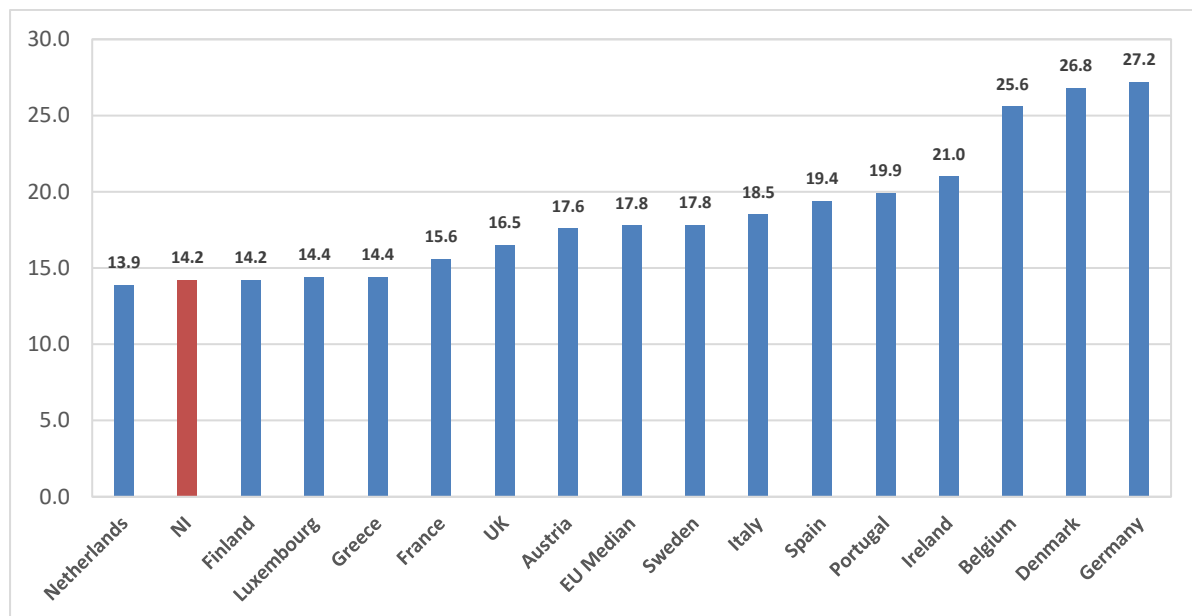
Table 6.1 earlier showed that Northern Ireland had the highest weekly expenditure on electricity of all UK regions over the period 2014-17, while Table 6.3 showed that unit costs for electricity in 2017 for domestic customers in Northern Ireland were the lowest of all UK regions. These data, whilst from different sources, appear contradictory but this might be at least partially explained by the different time periods covered. The ONS Living Costs and Food Survey covers the period April 2014 to March 2017. During this period, unit electricity costs in Northern Ireland (as sourced from BEIS and used in Table 6.3) were 12% higher than the UK average in 2014 and 7% higher in 2015. By 2016, unit prices in NI were cheaper than the UK average (by 5%) and this continued into 2017 where prices in NI were 11% lower.

So, for the three year period covered by the Living Costs and Food Survey, unit electricity costs in NI were higher than the UK for one year and nine months and lower for one year and three months. It is also worth bearing in mind that the Living Costs and Food Survey is a sample of households and not a census of the whole population and therefore estimates are subject to sampling variability.

### Comparison with EU

Electricity prices for domestic customers in Northern Ireland can also be compared with other EU countries. The chart below compares the Northern Ireland regulated price with the most recent available prices for other EU countries.

Chart 6.1 Domestic Electricity Prices in the EU for medium consumers<sup>142</sup>, July-Dec 2017 (p/kWh)



Source: BEIS<sup>143</sup> and Utility Regulator for NI

For domestic customers, the Northern Ireland regulated tariff in the period July to December 2017 was 14.2 pence per kilowatt hour (p/kWh) including taxes<sup>144</sup> which was 20% below the EU15 average

<sup>142</sup> Medium consumers are those consuming 2,500 - 4,999 kWh per annum. Prices include all taxes.

<sup>143</sup> See Table 5.6.2: Medium consumers (2,500-4,999 kWh) including taxes, from BEIS's Quarterly Energy Prices – link [here](#)

<sup>144</sup> It should be noted that Power NI announced a 5.6% increase in their regulated domestic tariff, effective from 1st October 2017.



(median) figure of 17.8 p/kWh and 14% below the UK figure of 16.5p/kWh and lower than 14 of the 15 EU countries (only the Netherlands had a lower rate). This shows a significant change since 2015 when the Northern Ireland tariff was 16% above both the UK and EU median figure and higher than 13 of the 15 EU countries<sup>145</sup>.

### Electricity Prices – Non-Domestic Customers

The Utility Regulator regularly publishes data on electricity prices for the non-domestic sector<sup>146</sup>. These figures are presented in the charts and tables below.

At present, all business users who consume more than 50 MWh per year can obtain an individual quotation from active electricity suppliers in the Northern Ireland market. Many of these customers, especially the larger customers, follow a tender exercise and subsequently agree individual contracts with their supplier, often with unique terms and conditions (including price). Due to the bilateral nature of such agreements, non-domestic electricity prices for Northern Ireland are not published by suppliers and such information has historically not been available from any other source.

Due to this data gap, the Utility Regulator developed average electricity non-domestic prices per consumption band and since 2013 has reported these for Northern Ireland. The Utility Regulator follow BEIS's format and methodology<sup>147</sup> which means Northern Ireland prices can then be compared to those collected and published by BEIS and Eurostat for the EU Member States.

### Non-domestic Market Breakdown

The information from the Utility Regulator on non-domestic electricity prices is broken down into different user groups depending on their annual consumption. As Table 6.4 shows, the largest proportion of non-domestic customers in Northern Ireland is in the smallest consumption size band. These 'very small' consumers represented two thirds (66.9%) of total Industrial & Commercial (I&C) customers in Quarter 4 2017 but only 7.3% of consumption.

Table 6.4: Northern Ireland Non-domestic Market Breakdown, End of Q4 2017

Size of consumer	Annual Consumption (MWh)	% of I&C customers	% of I&C consumption
Very small	< 20	66.9%	7.3%
Small	20 - 499	31.6%	36.3%
Small/Medium	500 - 1,999	1.1%	16.1%
Medium	2,000 - 19,999	0.4%	25.6%
Large/Very Large	> 20,000	0.03%	14.7%

Source: Utility Regulator

The majority of consumption is accounted for by a much smaller number of users, namely the 'small/medium', 'medium' and 'large/very large' groups. Together these three groups accounted for less than 2% of all I&C customers but they were responsible for over 56% of non-domestic electricity

<sup>145</sup> See pages 92-93 of <https://www.economy-ni.gov.uk/publications/energy-northern-ireland-2016>

<sup>146</sup> See Transparency Reports at <https://www.uregni.gov.uk/transparency-reports>

<sup>147</sup> For further details on the methodology used see page 20 of the November 2015 Transparency Report [here](#)

consumption in Q4 2017. These findings are in line with the data presented in Table 3.2 earlier – i.e. that a small number of large industrial and commercial users consume a disproportionate amount of electricity.

It should be noted that few, if any, of our largest energy users would be considered ‘energy intensive’ by international, EU or UK standards. Most businesses therefore consume relatively little electricity, but a very small number are heavily reliant on it.<sup>148</sup>

### **Non-domestic Electricity Prices**

The charts overleaf show industrial and commercial (or non-domestic) electricity prices in the 15 EU countries and in Northern Ireland by consumption size band for Quarter 4 2017. All prices shown are pence per kilowatt hour (p/kWh). The charts show non-domestic average unit prices, including Climate Change Levy (CCL)<sup>149</sup> but excluding VAT. As VAT is a refundable expense for many businesses, excluding VAT means that the values are more representative of the actual energy costs for businesses.

Smaller electricity users typically have to sign up to available tariffs from providers (similar to domestic customers), whereas larger users have more scope to negotiate tailored deals, often with unique terms and conditions (including price), based on their much higher consumption. Indeed, as the charts show, the price per kilowatt hour falls as consumption increases for all countries shown.

### **Comparisons with other regions<sup>150</sup>**

#### **UK**

Chart 6.2 shows that Northern Ireland prices in Quarter 4 2017 were below the UK in all but one category (the small/medium sector). Prices in Northern Ireland were 9% lower in the very small category and 1% lower in the small category. As Table 6.4 above showed, some 98.5% of non-domestic customers in Northern Ireland are in these two categories combined.

Northern Ireland prices were significantly lower than the UK for the largest industrial and commercial electricity consumers: in the medium category they were around 12% lower and were 24% lower in the large/very large category.

#### **EU**

Northern Ireland prices in Quarter 4 2017 were above the EU median price in all categories except the very small category where the NI price was 14% lower. Northern Ireland prices were substantially above the EU median price for the largest consuming sectors: in the small/medium category (22% higher), the medium category (15% higher) and in the large/very large category of non-domestic electricity consumers (30% higher). However, it is worth noting that the price differential between NI

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<sup>148</sup> Source: The Cost of Doing Business in Northern Ireland ([link here](#))

<sup>149</sup> The Climate Change Levy (CCL), is a tax on electricity, gas and solid fuels delivered to non-domestic consumers. Its objective is to encourage businesses to reduce their energy consumption or use energy from renewable sources. The rate changes every year. From 1 April 2012, it is 0.509p/kWh.

<sup>150</sup> For further reading, Chapter 4 of DETI’s ‘The Cost of Doing Business in Northern Ireland’ report ([link here](#)) looks at reasons for the differences in electricity prices between Northern Ireland and GB and Northern Ireland and the Republic of Ireland.

and the EU average has shown a large reduction over the last two years. The first Energy in Northern Ireland report<sup>151</sup> showed that for the same period in 2015, NI prices were above the EU average in every category with percentage price differences for the small/medium, medium and large/very large categories about twice what they were in 2017.

#### Republic of Ireland

Northern Ireland industrial and commercial prices were lower in Quarter 4 2017 for the smaller groups and equivalent to or slightly higher in the larger categories compared to Republic of Ireland prices.

NI prices were substantially lower (-27%) than Republic of Ireland prices in the very small category (Table 6.4 showed that two thirds of I&C customers are in this category) and were some 7% lower in the small category (which accounts for another 32% of Northern Ireland I&C customers).

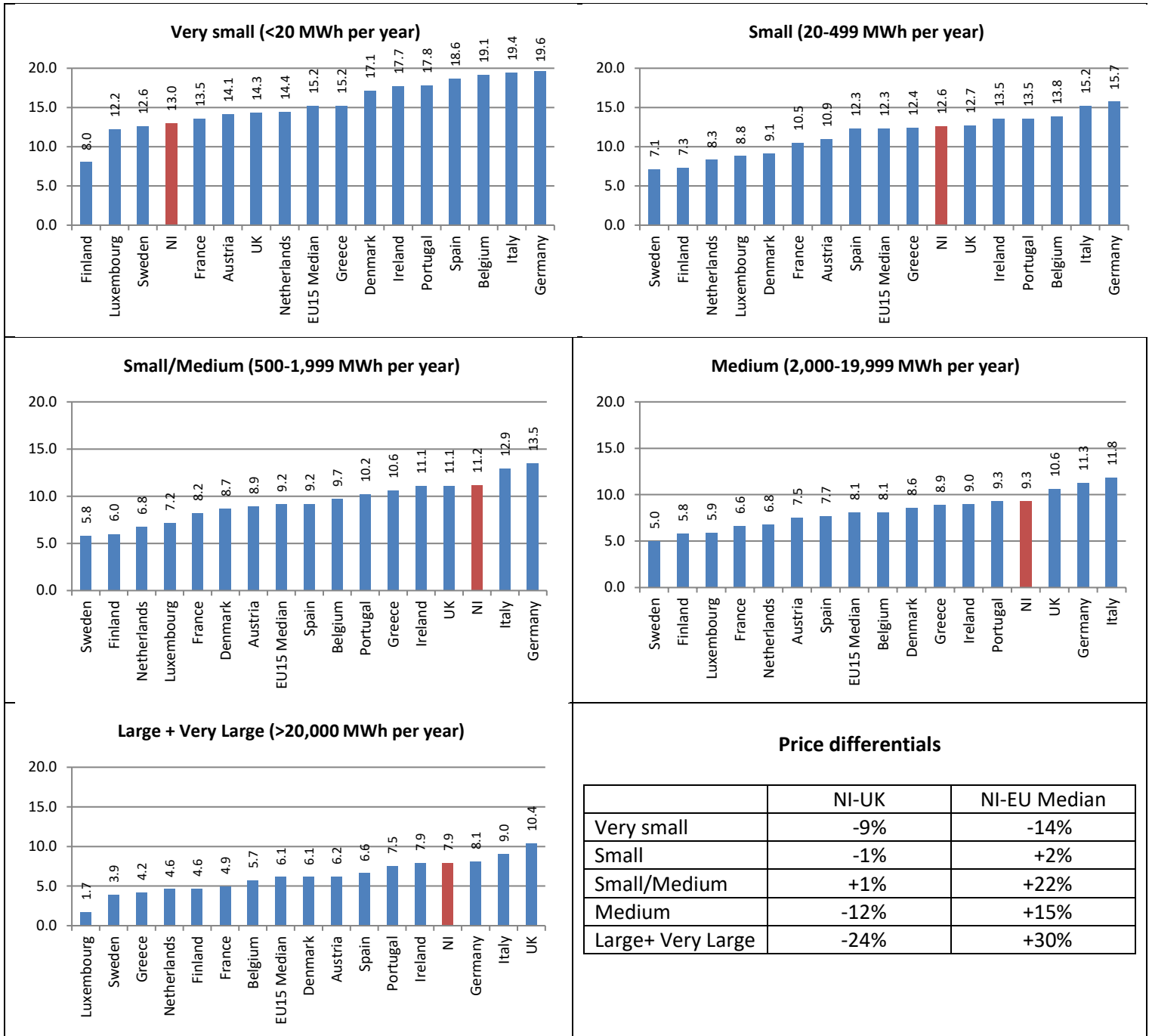
However, Northern Ireland industrial and commercial prices were slightly above Republic of Ireland prices in the small/medium (+1%) and medium (+3%) categories with no difference in prices for the large/very large group. Again, as with the EU average, the percentage price differences between NI and the Republic of Ireland has shown a large reduction over the last two years in these categories<sup>152</sup>.

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<sup>151</sup> See page 95 of <https://www.economy-ni.gov.uk/publications/energy-northern-ireland-2016>

<sup>152</sup> See page 94 of <https://www.economy-ni.gov.uk/publications/energy-northern-ireland-2016>

Chart 6.2 Non-domestic electricity prices (p/kWh)<sup>153</sup> by consumption size band, Quarter 4 2017



Source: Utility Regulator

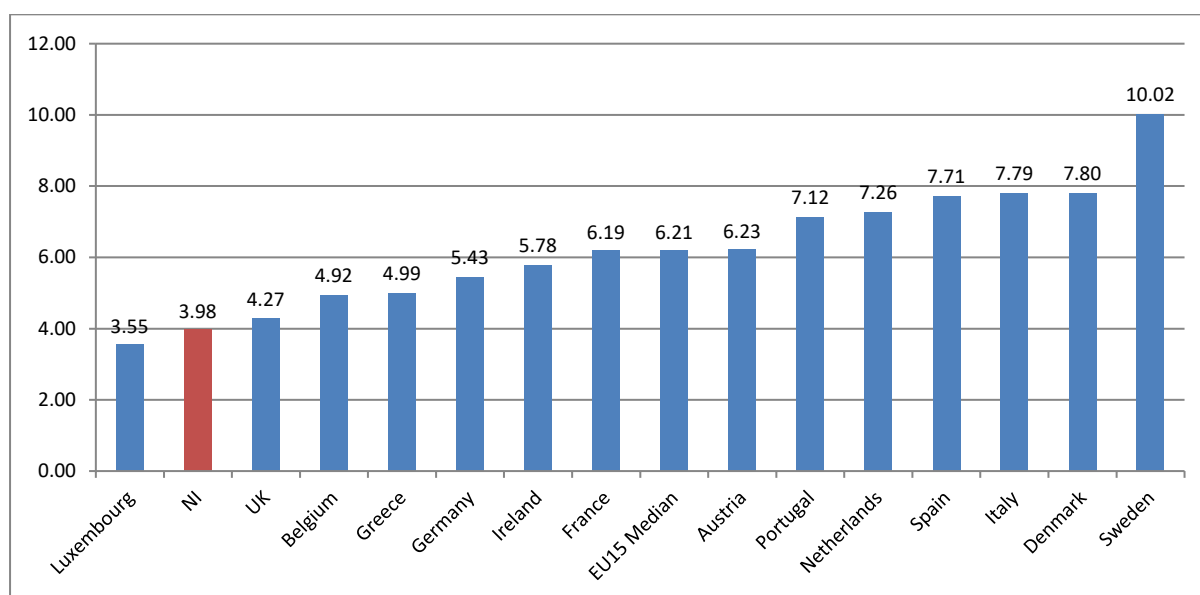
<sup>153</sup> Prices exclude VAT but include other taxes

## Gas Prices

There is limited information available on gas prices in Northern Ireland. Indeed, BEIS do not publish any gas consumption or price data (either domestic or non-domestic) relating to Northern Ireland due to the limited availability of gas here (compared to GB) and the difference in market structure.

However, the Utility Regulator does publish some information on domestic gas prices in Northern Ireland and compares these against other EU countries<sup>154</sup>. This data is replicated in the chart below.

Chart 6.3 Domestic gas prices including taxes (p/kWh) in the EU15 for medium consumers, July-December 2017



Source: Utility Regulator

The NI price shown is the average pence per kWh for medium customers<sup>155</sup> for the Greater Belfast and Ten Towns network areas. Chart 6.3 shows that Northern Ireland domestic gas prices were amongst the lowest in the EU (only Luxembourg had a lower tariff). In the last six months of 2017, average domestic gas prices in Northern Ireland were around 36% or 2.23p/kWh lower than the EU15 median price, 31% or 1.80p/kWh lower than the Republic of Ireland and about 7% or 0.29p/kWh lower than the UK.

It should be noted that the tariffs shown for all countries in Chart 6.3 are subject to change. For example, price increases were announced by SSE Airtricity in the Greater Belfast area and firmus energy in the Ten Towns in March 2018<sup>156</sup>.

<sup>154</sup> See Quarterly Transparency Reports at <https://www.uregni.gov.uk/transparency-reports>

<sup>155</sup> Medium consumers are those with annual consumption between 5,557 -55,557 kWh.

<sup>156</sup> See page 37 of Utility Regulator's May 2018 Quarterly Transparency Report [here](#)

## Road Fuel Prices

As shown in Chapter 5 earlier, some 27,646 GWh of petroleum products were consumed in Northern Ireland in 2015 (as a comparison, total electricity consumption was around 7,800 GWh in Northern Ireland in the same year). Therefore consumption of such products are significant and the price paid by consumers for these fuels is worthy of separate consideration.

The AA produces regular reports<sup>157</sup> on road fuel prices (i.e. petrol and diesel) by UK region. Information from the most recent report is shown in Table 6.5 below. All prices shown are pence per litre (ppl).

Table 6.5 Road fuel prices by UK region (ppl) - average of mid-month prices, April 2018

<b>Garages and Supermarkets</b>	<b>Unleaded petrol (pence per litre)</b>	<b>Diesel (pence per litre)</b>
Northern Ireland	120.6	122.8
Scotland	121.2	124.3
Wales	121.3	124.0
North East	121.0	123.6
North West	120.3	123.8
Yorkshire & Humberside	120.6	123.5
West Midlands	121.0	123.7
East Midlands	121.2	124.2
East Anglia	121.9	124.9
London	122.0	124.8
South East	122.3	125.1
South West	121.6	124.5
UK Average	121.4	124.2

<b>Supermarkets</b>	<b>Unleaded petrol (pence per litre)</b>	<b>Diesel (pence per litre)</b>
UK Average	118.4	121.2

Source: The AA<sup>158</sup>

In April 2018, the average price for unleaded petrol in Northern Ireland was lower than the UK average price, the second lowest of all UK regions and stood at 120.6 pence per litre. The South East recorded the highest price for petrol at 122.3 ppl whilst the North West recorded the lowest price for unleaded at 120.3 ppl.

The South East recorded the highest diesel price at 125.1 ppl in April 2018 whilst Northern Ireland had the lowest average diesel price at 122.8 ppl, some 2.3 ppl below the highest UK region and 1.4 ppl below the UK average.

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<sup>157</sup> See [http://www.theaa.com/motoring\\_advice/fuel/](http://www.theaa.com/motoring_advice/fuel/). BEIS also produce data on road fuel prices (see [here](#)) but these are only available at UK level. However, analysis of the AA and BEIS data at UK level shows a strong correlation with differences typically less than 1%. The AA data is used in this compendium to allow for Northern Ireland data to be shown and also to allow for regional comparison.

<sup>158</sup> The AA Fuel Price Report uses data sourced from Experian Catalist (<https://www.experian.co.uk/catalist/index.html>)

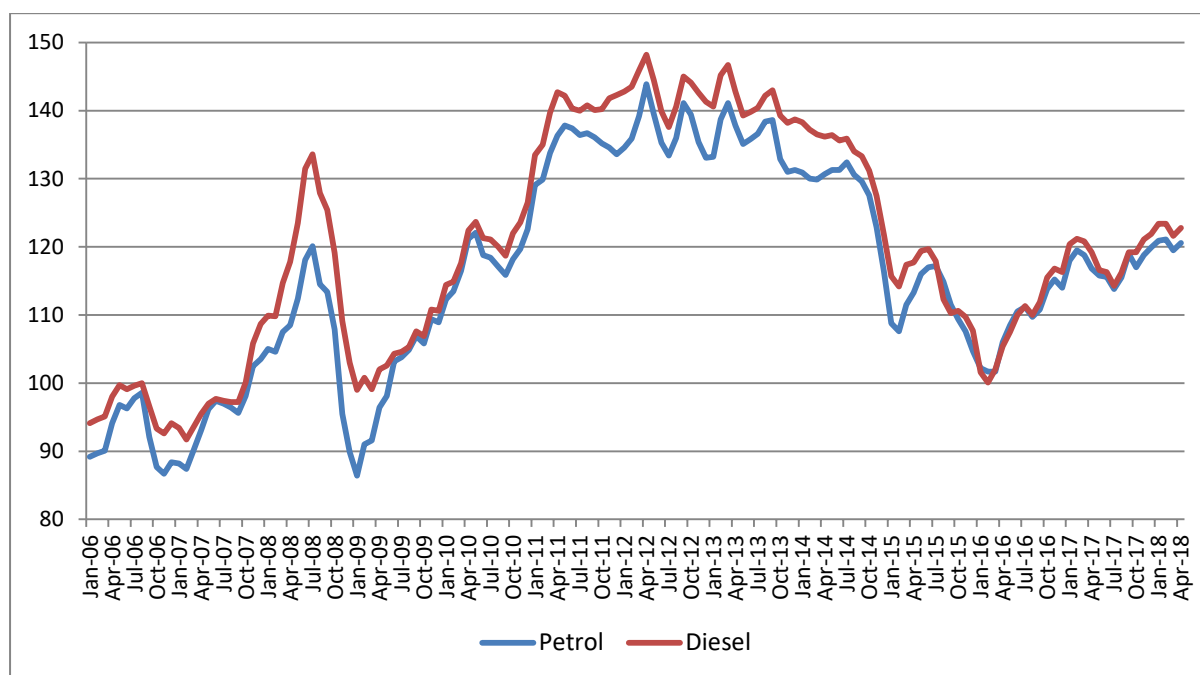
It is also worth noting that the UK average fuel price for both petrol and diesel in supermarket forecourts were three pence per litre cheaper than the average UK price for all retailers (i.e. supermarkets and garages) and it is probable that a similar situation exists in Northern Ireland.

### Price history

Whilst current prices for petrol and diesel are fairly similar (though diesel was 2.2 pence per litre higher in Northern Ireland in April 2018) this has not always been the case as the chart below shows.

Chart 6.4 details the history of prices for petrol and diesel in Northern Ireland over last 12 years. Over the 12 month period April 2008-March 2009, for example, diesel was some 11.7 ppl higher than petrol, with a maximum difference of 13.6 ppl in November 2008. Indeed, over the 12 year period shown, diesel prices were on average about 4 ppl higher than petrol. Over the period shown, diesel prices first dipped below petrol prices in August and September 2015 and again in five of the six months between January and June 2016 but these were the only months when this occurred during the more than twelve year period shown.

Chart 6.4 Price history of petrol and diesel in Northern Ireland (ppl), January 2006 – April 2018



Source: The AA

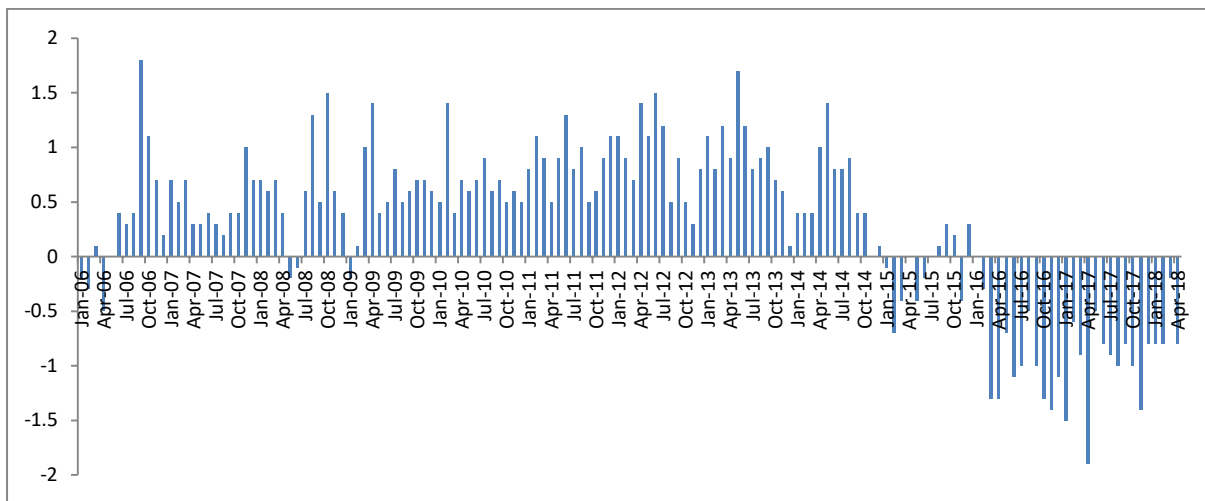
Diesel and petrol prices at the end of 2015/start of 2016 were at their lowest level since 2009 (at around one pound per litre). However, there has been a steady rise in prices since then with average diesel and petrol prices of over 120 ppl at the end of 2017/start of 2018.

The average diesel price in the first four months of 2018 (around 122.8 ppl) is still over 17% below the peak price of 148.2 in April 2012. Similarly, the average petrol price in the first four months of 2018 (around 120.5 ppl) is still over 16% below the peak price of 143.9 in April 2012. However, diesel and petrol prices in early 2018 were significantly higher than the prices for such fuels in early 2007 (34% and 39% higher respectively).

## Historic comparison NI v UK

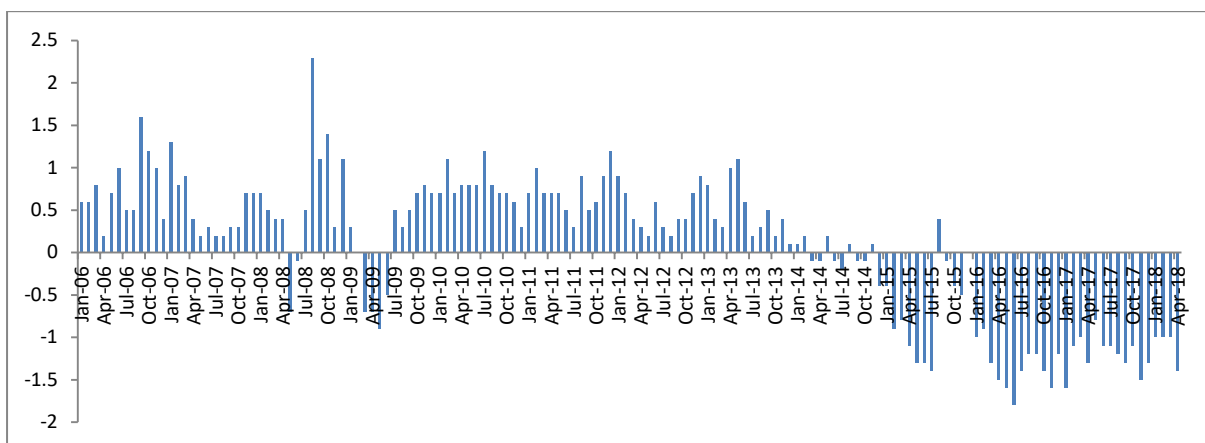
The charts below show the price differential in pence per litre between the Northern Ireland average and UK average prices for petrol and diesel. The charts show that, in general, petrol and diesel prices in Northern Ireland were higher than the UK average for each fuel type up to the end of 2014. However, during 2015, this trend reversed and, since then, average prices in Northern Ireland are generally below, or equivalent to, the UK average price. Indeed, the diesel price in Northern Ireland since January 2016 has been on average 1.2 pence per litre below the UK average and, in April 2018, was the lowest of any UK region.

Chart 6.5 Differential in petrol prices between NI and UK (ppl), January 2006 – April 2018



Source: The AA

Chart 6.6 Differential in diesel prices between NI and UK (ppl), January 2006 – April 2018



Source: The AA



## **Annex 6.1      Notes to Table 6.3**

All bills are calculated assuming an annual consumption of 3,800 kWh. Bills and unit costs reflect the prices of all suppliers and include standing charges. Figures are inclusive of VAT. Bills relate to calendar year, i.e. covering consumption from Q1 to Q4 of the named year. Unit costs are calculated by dividing the bills shown by the relevant consumption levels.

In Q4 2015, a £12 Government rebate was applied to electricity bills for all customers in Great Britain. This is included in the figures in Table 6.3.

Data on electricity tariffs is received directly from all the main energy companies that supply electricity across the UK via a quarterly survey. The suppliers provide figures for each tariff (unit costs, standing charges, split levels, discounts, dates of tariff changes and number of customers), splitting the tariff information by payment type and region.