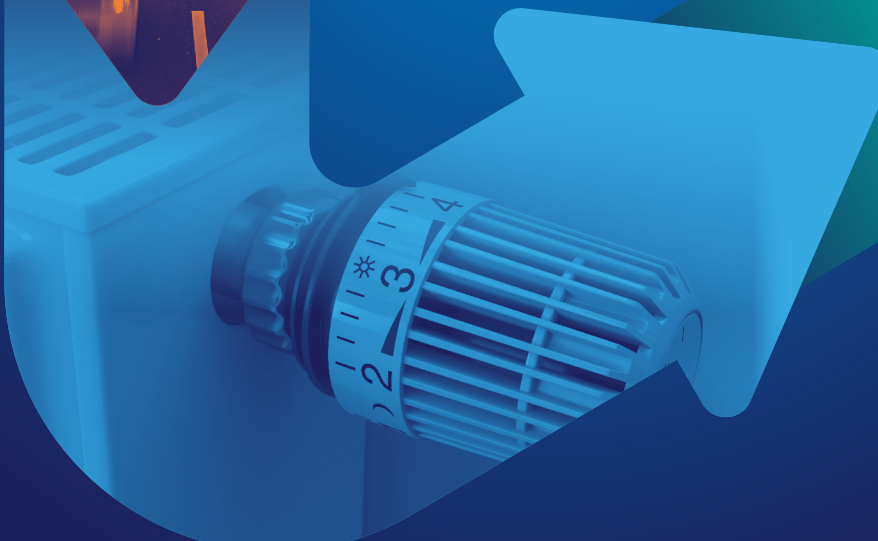




Energy

in Northern Ireland



2022



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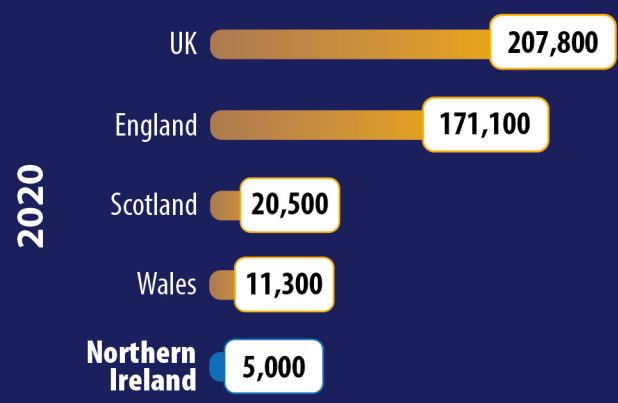
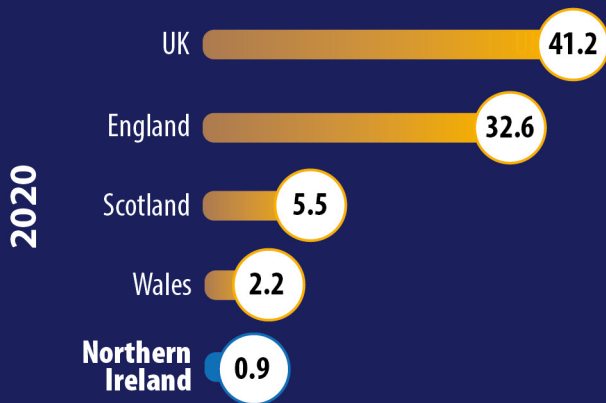
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Low Carbon & Renewable Energy Economy, 2020

Turnover (£billion)

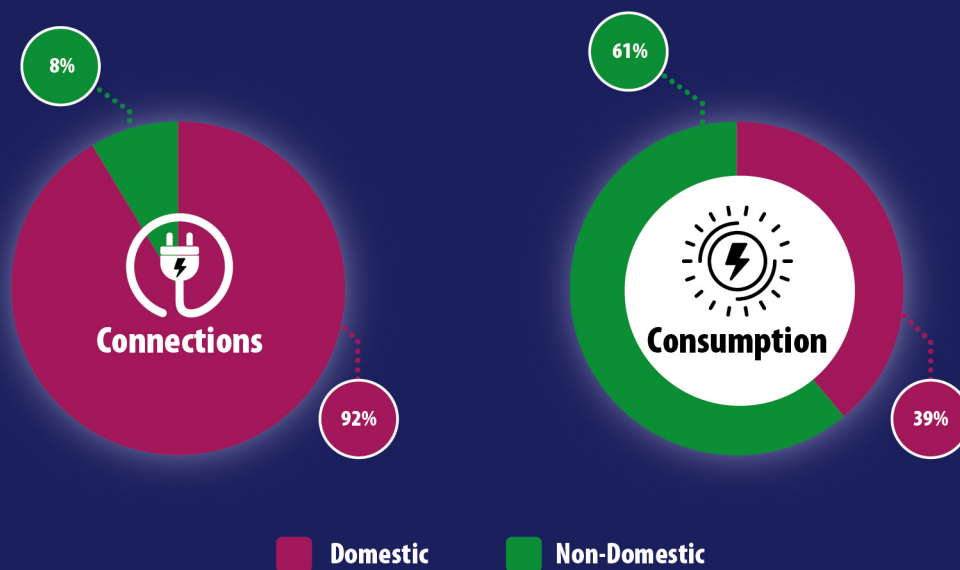


Employees (FTE)



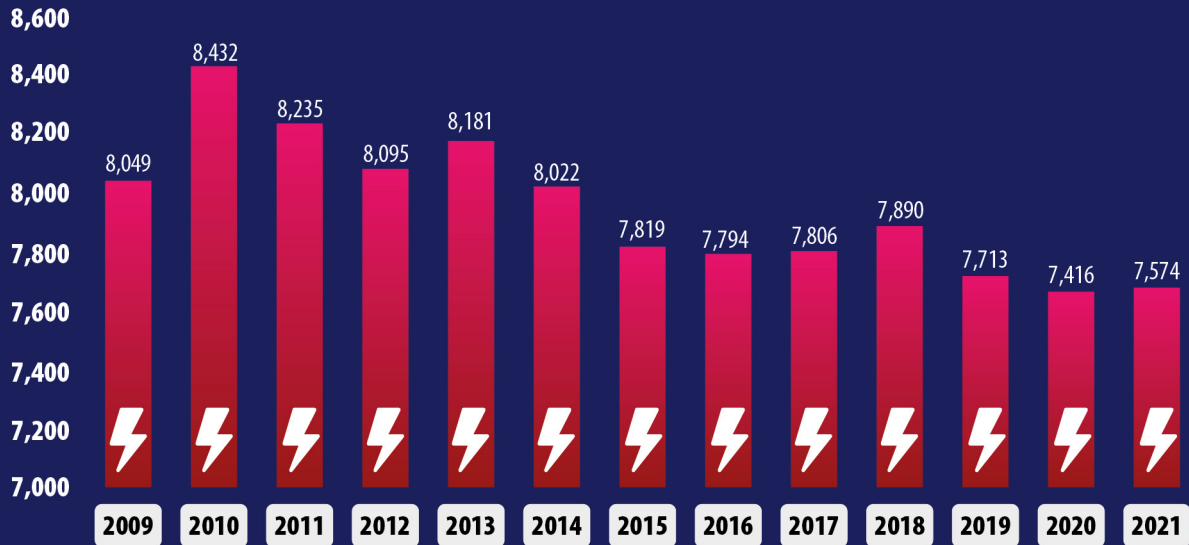
Energy in Northern Ireland 2022: CHAPTER 2

Electricity Connections & Consumption in Northern Ireland, 2021



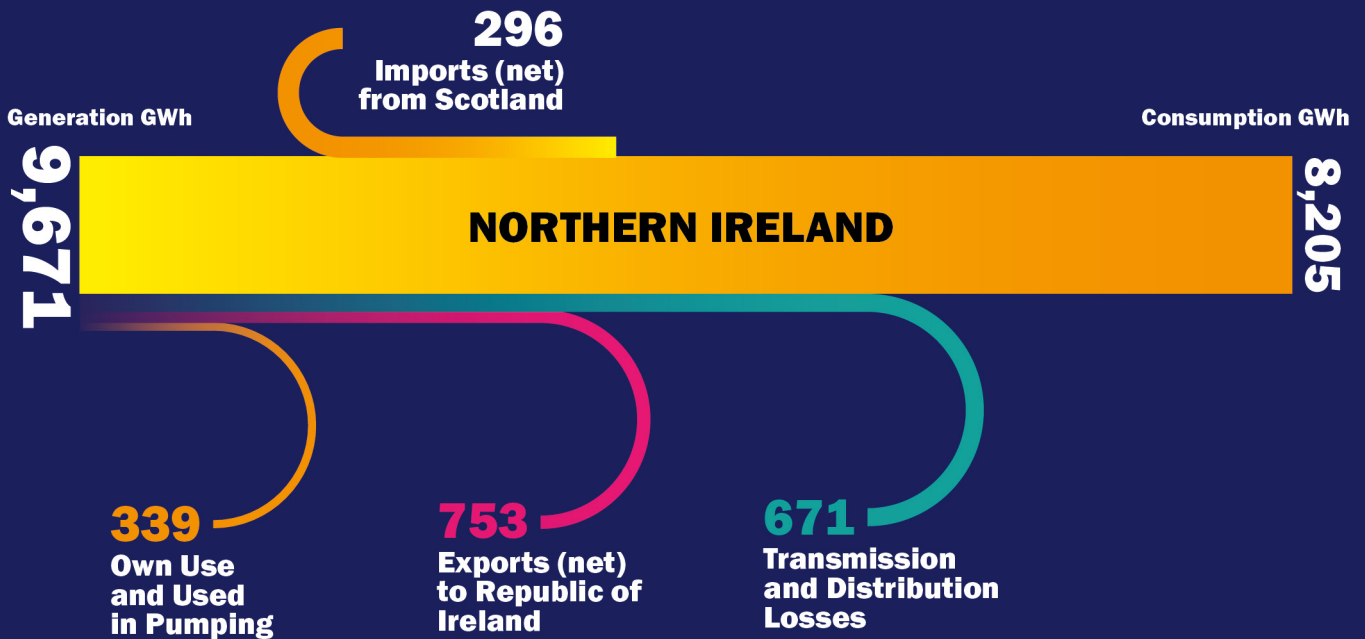
Energy in Northern Ireland 2022: CHAPTER 3

Total Electricity Consumption in Northern Ireland (GWh)



Energy in Northern Ireland 2022: CHAPTER 3

Electricity Generation & Consumption Flow Chart, 2020



Energy in Northern Ireland 2022: CHAPTER 3

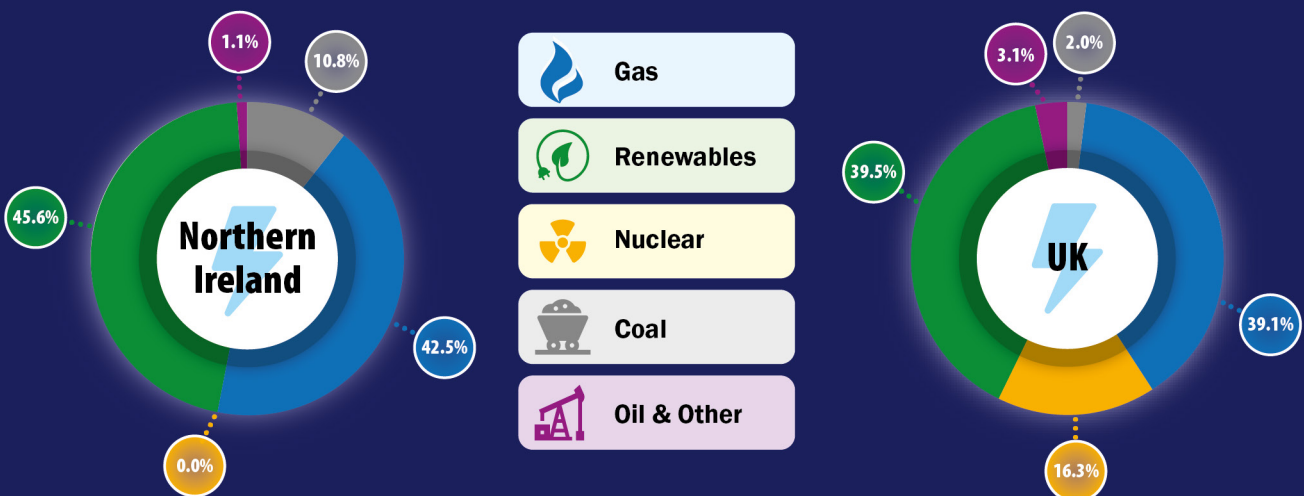
Renewable Electricity Generation, 2021

41.3% of Electricity Consumption in NI was Generated from Renewable Sources



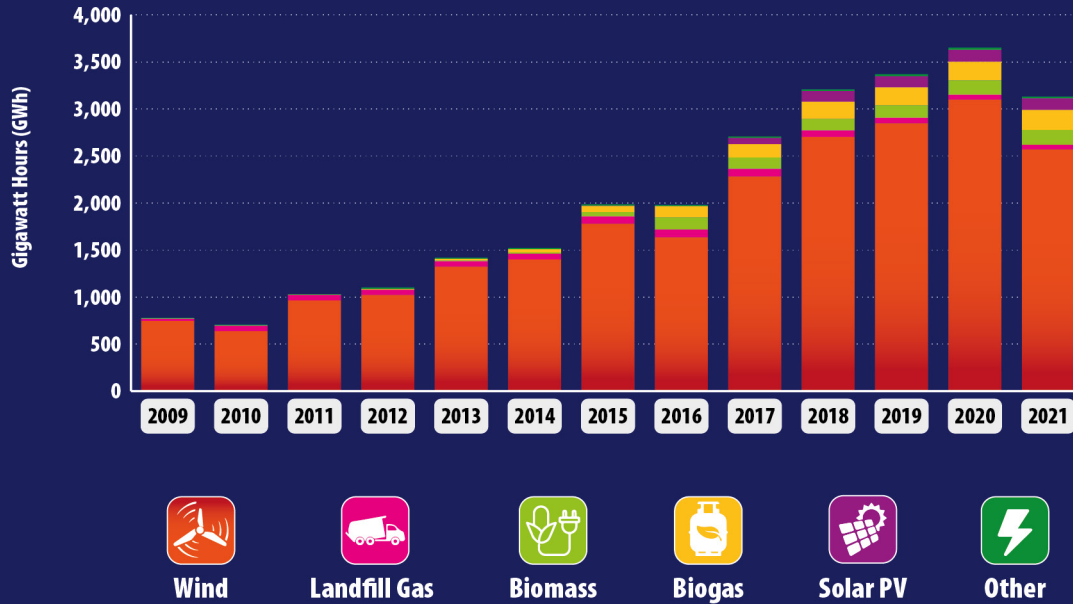
Energy in Northern Ireland 2022: CHAPTER 4

Electricity Generation by Fuel, 2020



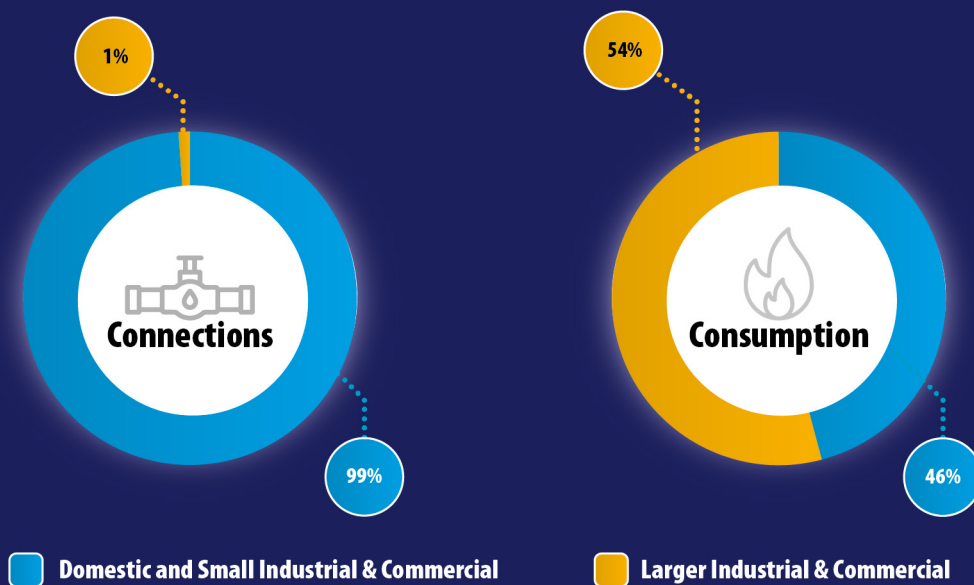
Energy in Northern Ireland 2022: CHAPTER 4

Annual Volume of Renewable Electricity Generated



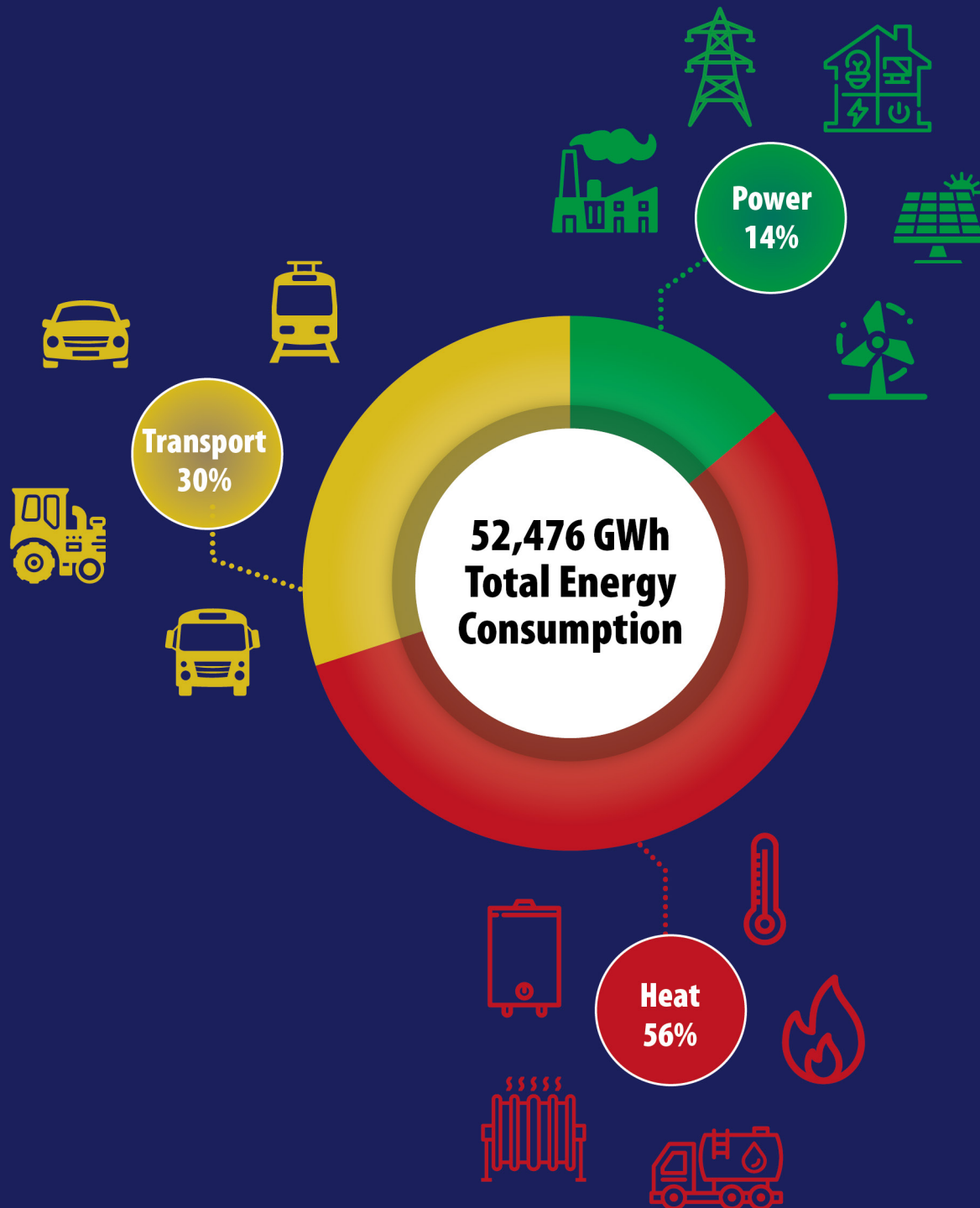
Energy in Northern Ireland 2022: CHAPTER 4

Gas Connections & Consumption in Northern Ireland, 2021

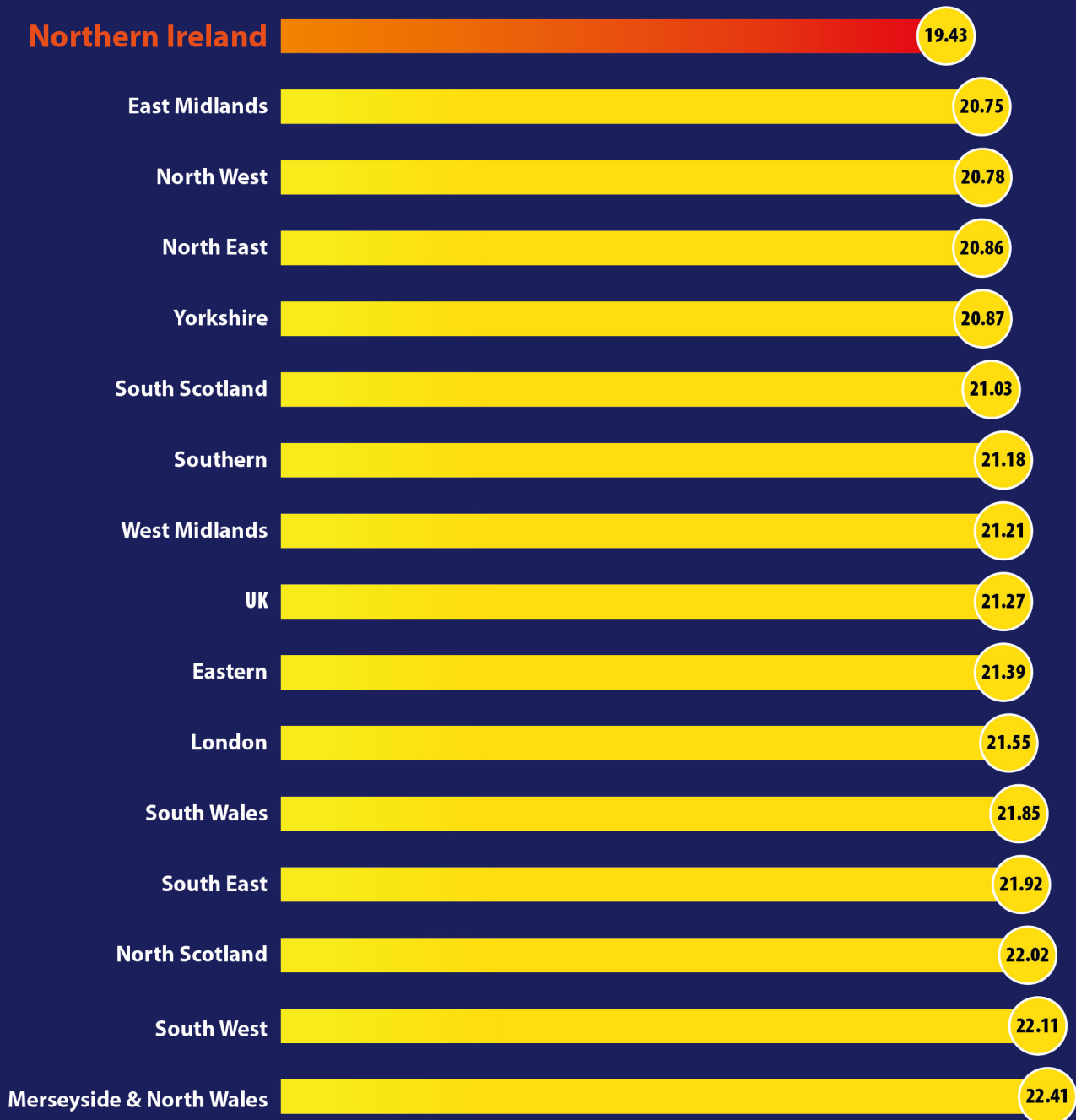


Energy in Northern Ireland 2022: CHAPTER 4

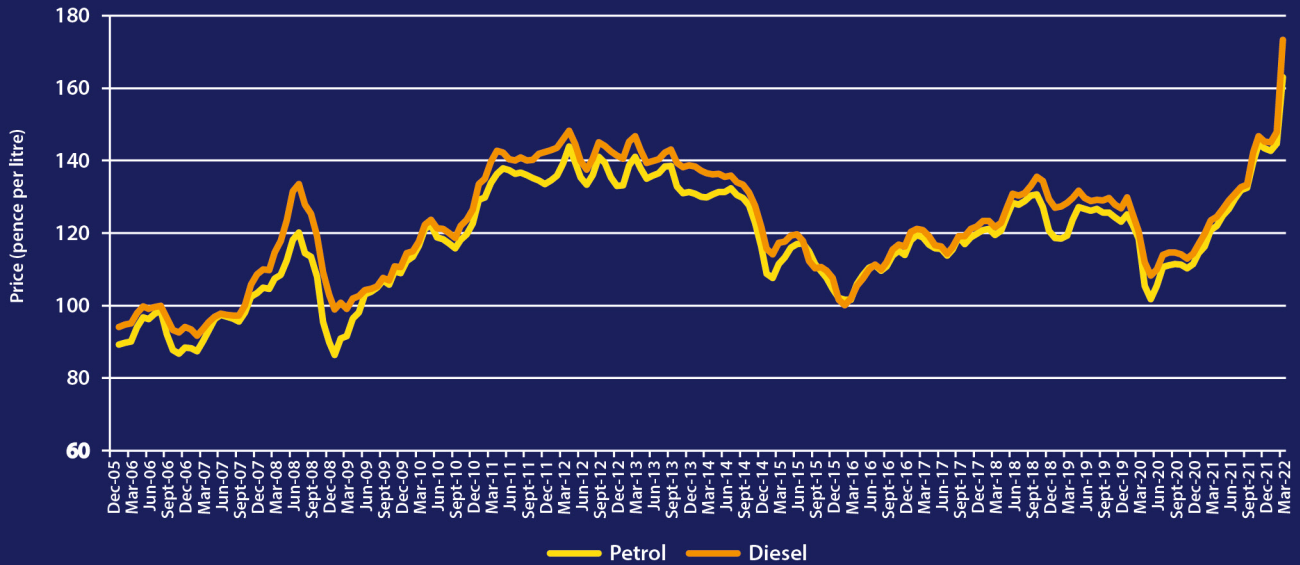
Total Final Energy Consumption Northern Ireland, 2019



Average Annual Domestic Electricity Unit Costs (pence per kWh) for UK Regions, 2021









NI Petrol & Diesel Prices



Energy in Northern Ireland 2022: CHAPTER 6

Household Expenditure & Central Heating Type by Country – NI, UK, ROI

	Proportion of weekly energy expenditure that is spent on:			Proportion of households with central heating that is:		
	 Electricity	 Gas	 Other Fuels	 Oil	 Gas	 Other
Northern Ireland	45%	14%	41%	68%	24%	8%
UK	51%	43%	7%	4%	85%	11%
Republic of Ireland	46%	21%	33%	41%	35%	24%

Energy in Northern Ireland 2022: CHAPTER 6



Table of Contents

Energy in Northern Ireland 2022	2
Reader Information	13
Chapter 1: Northern Ireland Energy in Context	15
Geography	16
Climate	16
Population	17
Transport	17
Housing	18
Economy	18
Chapter 2: Energy and the Economy	20
Summary of Key Points	20
Introduction	21
The Low Carbon and Renewable Energy Economy (LCREE)	21
LCREE Headline Results by Region	22
Direct Activity – Northern Ireland	22
Regional Estimates	24
LCREE Activity by Group	24
Energy and the Wider Economy	25
Energy Sector Enterprises	25
Energy Sector Employment	28
Energy Sector Gross Value Added (GVA)	30
Energy Sector GVA per Head	31
Energy Sector Turnover	32
Annex 2.1 Low Carbon and Renewable Energy Economy (LCREE) Scope	34
Annex 2.2 Notes to Table 2.2	36
Chapter 3: Electricity	38
Summary of Key Points	38
Introduction	39
Generation	39
Transmission	40
Distribution	40
Supply	40
Wholesale Electricity Markets	40
The Single Electricity Market (SEM)	40
The New Market – the I-SEM	41
Benefits of I-SEM	42
Electricity Consumption – Monthly	42
Electricity Consumption – Annual	43
Sub-National Electricity Consumption	44
Domestic Versus Non-Domestic Consumption – Northern Ireland	45
Domestic Versus Non-Domestic Consumption – Regional Comparisons	47
Electricity Flowchart	49
Autogeneration	51



Imports, Exports and Transfers of Electricity in Northern Ireland	52
Annex 3.1 Map of the Transmission System Network for Northern Ireland	54
Annex 3.2 Generation and Supply	55
Annex 3.3 Differences in Consumption Measures	57
Chapter 4: Renewable Electricity	59
Summary of Key Points	59
Introduction	60
Definition	60
Measuring Renewable Electricity Targets	60
Headline Measure – Rolling 12-Month Average	61
Annual Proportion	61
Monthly Proportion	62
Volume – Rolling 12-Month Period	63
Volume – Monthly	64
Volume – Calendar Year	65
Other Renewable Electricity Data – UK and UK Regions	66
Renewable Installed Capacity – UK and UK Regions	67
Generation Volumes – UK and UK Regions	70
Sub-Regional Renewable Data	71
Electricity Generation by Fuel Type – UK Countries	72
Renewable Electricity Generation by Country – Comparable Basis	73
Renewable Energy Planning Data	74
Annex 4.1 Renewable Proportion and Total Consumption Volume by Month	76
Annex 4.2 Comparisons of Annual Renewable Generation Volume Data	77
Annex 4.3 Comparisons of Annual Renewable Percentages	79
Annex 4.4 Mapping Old Council Areas to New Super Council Areas	80
Sub-National Renewable Electricity Data for the Previous 26 District Council Areas, 2020	81
Chapter 5: Total Energy Consumption	83
Summary of Key Points	83
Introduction	84
BEIS Total Final Energy Consumption Data	84
Sub-Northern Ireland Final Energy Consumption Estimates	86
Petroleum Products	86
Gas and Electricity	86
Coal	86
Consuming Sector	86
Gas	88
Transmission	88
Distribution	88
Supply	89
Gas Connections	89
Gas Consumption	91
Quarterly Data	92
Gas Consumption – District Council Level	95
Number of Meters – District Council Level	95
Consumption per Meter – District Council Level	95
Coal	97



Road Transport Energy Consumption	98
Comparisons with Great Britain	98
Sub-National Road Transport Energy Consumption	100
Buses	100
Cars	100
HGV	100
Consumption by Use	100
Total Energy Consumption for Northern Ireland	102
Total Energy Consumption by Purpose for Northern Ireland	103
Annex 5.1 Map of Transmission Gas Pipelines	104
Annex 5.2 Assignment of Energy Consumption to Power, Heat or Transport Purpose/Sector	105
Chapter 6: Energy and the Consumer	107
Summary of Key Points	107
Introduction	108
Household Expenditure on Energy	108
Electricity Prices – Domestic Customers	111
Comparison with EU	114
Electricity Prices – Non-Domestic Customers	114
Non-Domestic Market Breakdown	115
Non-Domestic Electricity Prices	115
Comparisons with Other Regions	116
UK	116
EU	116
Ireland	116
Gas Prices	118
Road Fuel Prices	119
Price History	120
Historic Comparison NI v UK	121
Annex 6.1 Notes to Table 6.3	123



Reader Information

Purpose

This is the fourth edition of a publication that 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.

The publication is structured around 6 chapters including: 1) key socio-demographic statistics for Northern Ireland to provide a broad context; 2) the economic contribution of energy to the local economy; 3) electricity generation, transmission, distribution and supply; 4) renewable electricity generation; 5) total energy consumption; and 6) energy and the consumer. All hyperlinks provided in this publication were operational as at May 2022.

Reporting Period

The data presented in the report was the most up-to-date available at the time of publication. Where possible, data for 2020 or 2021 has been used although some data relates to earlier periods.

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 2024.

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.



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Chapter 1:
**Northern Ireland Energy
in Context**



Chapter 1: Northern Ireland Energy in Context

Significant developments in relation to energy policy within Northern Ireland, nationally and internationally, have taken place since the previous 2020 publication of the Energy in Northern Ireland report.

The UK government launched the Net Zero Strategy in October 2021¹ setting out how the UK will deliver on its commitment to reach net zero emissions by 2050. The strategy outlined measures to transition to a green and sustainable future, helping businesses and consumers to move to clean power, supporting hundreds of thousands of well-paid jobs and leveraging up to £90 billion of private investment by 2030. By reducing reliance on imported fossil fuels, an aim was to protect consumers from global price spikes by boosting clean energy.

The COP26 international climate conference took place in Glasgow from 31 October to 12 November 2021². The main goal was to secure global net zero by mid-century and keep a maximum of 1.5 C degrees of warming within reach. Other goals included accelerating the phase-out of coal and mobilising at least \$100bn in climate finance per year. The two headline outcomes from COP26 were the signing of the Glasgow Climate Pact and agreeing the Paris Rulebook.

Locally, in December 2021, the successor to Northern Ireland's Strategic Energy Framework 2010-20 was launched in the form of 'The Path to Net Zero Energy', the new energy strategy for Northern Ireland. The new strategy aims to ensure Northern Ireland has an affordable, secure, and clean energy system for current and future generations. The strategy specifically targets net zero carbon and affordable energy as part of wider action to address climate change and deliver an economy that is ten times better than today through innovation³.

In brief, the headline targets associated with 'Path to Net Zero Energy' are:

- Energy Efficiency:** To deliver energy savings of 25% from buildings and industry by 2030
- Renewables:** Meet at least 70% of electricity consumption from a diverse mix of renewable sources by 2030
- Green Economy:** Double the size of the low carbon and renewable energy economy to a turnover of more than £2 billion by 2030

The new UK energy strategy was launched on 7th April 2022 in the context of an ongoing international crisis and resulting energy security of supply issues⁴. The strategy rehearses the aspiration that by 2030, 95% of electricity could be low-carbon and by 2035 to have decarbonised the electricity system, subject to security of supply. This transition outlined within the strategy is intended to reduce dependence on imported oil and gas and to deliver a radical long-term shift with cleaner, cheaper power, lower energy bills and thousands of high wage, high skilled new jobs.

1 [UK's path to net zero set out in landmark strategy. Gov.uk website.](#)

2 [What were the outcomes of COP26?. House of Commons Library website.](#)

3 [The Path to Net Zero Energy. Safe. Affordable. Clean. DfE website.](#)

4 [British energy security strategy. Gov.uk website.](#)



The rapid and recent developments in the broad policy context in responding to the Climate Emergency and, more recently security of supply issues, has refined and refocused efforts in relation to the transitions needed to reshape and restructure energy consumption. The energy transition will be gradual and strategic and the journey will be long. In that context, this report aims to provide a comprehensive overview of the current shape, nature and changes seen with energy in Northern Ireland to date and to provide a baseline.

The following headline facts relating to Northern Ireland in terms of both people and place, its geography, climate, population, transport, housing 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 and farther afield.

At 14,130⁵ km², the area of Northern Ireland comprises around 20% of the area of the island of Ireland⁶ and around 6% of the area of the United Kingdom.

A review of the Statistical Classification and Delineation of Settlements (2015) indicated that of Northern Ireland's 1.8 million people, over six in ten (63%) lived 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 people⁷.

Climate⁸

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 are 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.

5 [\[ARCHIVED CONTENT\] The countries of the UK ONS, National Archives website.](#)

6 [Ireland Maps & Facts - World Atlas.com website.](#)

7 [Review of the Statistical Classification and Delineation of Settlements, Northern Ireland Statistics and Research Agency website.](#)

8 [Northern Ireland climate, Met Office website.](#)



On the whole, Northern Ireland is cloudier than England because of the hilly nature of the terrain and the proximity to the Atlantic. The duller 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.

Population

The Northern Ireland population in mid-2020⁹ was estimated to be 1.9 million people. The number of children aged 0 to 15 years was 393,900 (21%), the working age population (persons aged 16 to 64) was 1,179,700 (62%) whilst the older population (persons aged 65 and over) was 319,900 (17%).

The Northern Ireland population is projected to grow from 1.9 million in 2020 to 1.92 million by 2025, 1.93 million by 2030 and 1.94 million by 2035. Projected population growth from 2020 to 2035 is therefore estimated to be around 2%¹⁰.

Projections for the number of households in Northern Ireland (2016 based) indicate growth from 725,127 households in 2016 to 740,528 in 2020, 763,976 in 2025, 784,580 in 2030 and 800,061 in 2035¹¹. Projected growth in the number of households from 2020 to 2035 is therefore estimated to be around 8%.

At 2020, the number of people per square kilometre was estimated to be 137 for Northern Ireland, 434 for England, 153 for Wales and 70 for Scotland¹². For the UK as a whole, the number of people per square kilometre was estimated to be 276.

Transport

In 2020/21, and compared to the UK as a whole (80%), households in Northern Ireland (89%) report a higher level of car ownership which has been a consistent picture over recent years^{13, 14}.

In Northern Ireland in 2020, of the 990,300 licensed cars, over half (57%) were diesel fuelled compared to 38% of the 32.7 million cars licensed in the whole of the UK¹⁵. In the UK as a whole, 621,564 ultra-low emission (plug-in) cars or light goods vehicles were registered in 2021 quarter 3, comprising 1.7% of all registered cars or light goods vehicles. In Northern Ireland, 7,542 ultra-low emission vehicles were registered comprising 0.7% of all cars and light goods vehicles registered in Northern Ireland.

In the period 2017-19, 71% of all journeys were made by car, 18% on foot, 5% by public transport, 1% by bicycle and 4% by other means^{16, 17}. By broad comparison and for England in 2020, 58% of journeys were made by car, 32% on foot, 4% by public transport, 3% by bicycle and 3% through other means¹⁸.

9 [2020 Mid Year Population Estimates for Northern Ireland Statistical Bulletin Charts, Tables and Maps. Northern Ireland Statistics and Research Agency website.](#)

10 [2020 based Interim Population Projections for Northern Ireland. Northern Ireland Statistics and Research Agency website.](#)

11 [Northern Ireland Household Projections \(2016 based\). Northern Ireland Statistics and Research Agency website.](#)

12 [Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland. Office for National Statistics website.](#)

13 [Family spending workbook 4. Expenditure by household characteristics. Office for National Statistics website.](#)

14 [Continuous Household Survey Results. Northern Ireland Statistics and Research Agency website.](#)

15 [All vehicles \(VEH01\). Gov.uk website.](#)

16 [Travel Survey for Northern Ireland in depth report 2017-2019. Department for Infrastructure website.](#)

17 Travel Survey results for Northern Ireland were released separately for 2020. Given the impact of Covid-19 and associated lockdown regulations and guidance on travel patterns and data collection, the 2020 results are not directly comparable to previous years. On that basis, the most recent pre-pandemic 2017-19 results are reported here. For further information see: [Travel Survey for Northern Ireland \(TSNI\) headline report 2020. Department for Infrastructure website.](#)

18 [National Travel Survey 2020. Gov.uk website.](#)



Looking at the recent Northern Ireland trends from the Travel Survey for Northern Ireland, travel habits have not changed considerably. Northern Ireland residents travelled, on average, 6,130 miles per person per year in 2017-2019, around the same as 10 years ago (6,001 miles in 2007-2009).

In Northern Ireland, on average, 906 journeys were made per person per year over the period 2017-2019. In 2017-2019, the average journey length was 6.8 miles. The average time each person spent travelling in 2017-2019 was 313 hours per year (approximately 51 minutes per day), no real difference from 10 years ago (308 hours in 2007-2009). The average journey time in 2016-2018 was 21 minutes.

During 2017-2019, public transport accounted for 7% of total distance travelled in Northern Ireland. Over the last 10 years, average distance travelled by public transport per person per year has remained around the same (448 miles in 2007-2009, 459 miles in 2017-2019). 5% of all journeys in 2017-2019 were on public transport. There were 48 public transport journeys per person per year in 2017-2019, similar to 10 years ago (52 in 2007-2009). On average, public transport journeys were 10.1 miles in length in 2017-2019.

Housing

The Northern Ireland House Conditions Survey for 2016 indicated that accommodation in Northern Ireland comprised 21% Bungalows, 28% terraced housing, 23% semi-detached houses, 21% detached houses and 7% flat/apartments¹⁹.

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 Ireland²⁰ compared to an average of 62 for England²¹ in 2016.

In Northern Ireland in 2016²², 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 2021 was 77,640²³. For the UK as a whole, there were 2.77 million businesses registered in 2021²⁴.

In 2021, just over half of all registered businesses in Northern Ireland were within the agriculture (23%), construction (14%), retail (8%), and professional, scientific and technical (8%) sectors. By comparison the agriculture sector accounted for 5% of all UK registered business, with 13% in construction, 8% in retail and 16% in professional, scientific and technical²⁵.

The Office for National Statistics (ONS) published estimates for regional Gross Domestic Product (GDP) across the UK covering the period 1999 to 2019²⁶. GDP is the total value of all the goods and services that a country (or region) produces or provides in a particular year. In 2019, Northern Ireland's GDP per head in current prices was £25,656 compared to £33,151 for the UK as a whole, £33,809 for England, £30,560 for Scotland and £24,586 for Wales. Looking at GDP per head at International Territorial Levels (ITL) throughout the UK, Northern Ireland had no ITL areas in the top 10 UK ITL areas, but had two in the bottom 10.

19 [House Condition Survey Main Report 2016, Northern Ireland Housing Executive website.](#)

20 [The Housing Executive, House Condition Survey, Northern Ireland Housing Executive website.](#)

21 [English Housing Survey 2016, Energy efficiency, Gov.uk website.](#)

22 [The Housing Executive, House Condition Survey, Northern Ireland Housing Executive website.](#)

23 [Inter Departmental Business Register, Northern Ireland Statistics and Research Agency website.](#)

24 [UK business activity, size and location, Office for National Statistics website.](#)

25 [UK business activity, size and location, Office for National Statistics website.](#)

26 [Regional economic activity by gross domestic product, UK, Office for National Statistics website.](#)

Chapter 2:
Energy and the Economy



Chapter 2: Energy and the Economy

Summary of Key Points

The Low Carbon and Renewable Energy Economy (LCREE)

- In 2020 in Northern Ireland, some £0.9 billion in turnover and 5,000 full time equivalent (FTE) jobs were generated directly by businesses active in the LCREE economy.
- There has been no statistically significant change in LCREE turnover and employment between 2015 and 2020 for the UK and any region, including Northern Ireland.
- In each year 2015 to 2020, businesses in Northern Ireland generated around 2.2% of direct UK LCREE turnover (e.g. £0.9 billion out of £41.2 billion in 2020) and provided about 2.5% of direct UK LCREE full-time equivalent employment (e.g. 5,000 out of 207,800 direct FTE employees in 2020).
- Of the total LCREE activity in Northern Ireland in 2020, Energy Efficient Products was the group that accounted for the largest proportion of direct turnover (38%) and direct FTE employees (54%).

Energy and the Wider Economy

- The total number of energy sector enterprises in Northern Ireland increased from 260 in 2011 to 905 in 2021, a three and a half fold increase. This was the largest percentage increase of all UK countries over this period. The major contributing factor to the overall rise in the number of energy sector enterprises in Northern Ireland was the large increase in the 'Electricity, gas, steam and air conditioning supply' sector (a ten-fold increase over the period 2011 to 2021).
- In 2019, an estimated 4,300 employee jobs were in the energy sector (constructed from a combination of Standard Industrial Classification codes) in Northern Ireland. This was equivalent to some 0.56% of all employee jobs in Northern Ireland in 2019.
- The proportion of employee jobs in the energy sector for Northern Ireland in 2019 (0.56%) was the lowest of all UK countries for this year: England (0.92%), Scotland (2.71%) and Wales (1.25%).
- Gross Value Added (GVA) per head in Northern Ireland for businesses operating in the 'Electricity, gas, steam and air conditioning supply' sector in 2020 was over nine 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 energy and the wider economy in terms of employment, economic output and the number of registered enterprises in Northern Ireland's energy sector using other definitions and a wider range of sources.

The Low Carbon and Renewable Energy Economy (LCREE)

The Low Carbon and Renewable Energy Economy (LCREE) survey²⁷ was despatched for the first time in 2015, for the reporting year 2014. The survey has been carried out annually since then with the most recent results relating to 2020 published in February 2022. Around 2,400 businesses in Northern Ireland were sent a questionnaire for the 2020 survey. The LCREE 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 LCREE 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 LCREE 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 less than one third (31%) of all businesses active in the LCREE economy across the UK in 2020²⁸. The financial sector is excluded from the survey and the LCREE survey therefore reports on the non-financial business economy.

The key variables collected by the LCREE survey included number of businesses²⁹, turnover and employment. The main results for Northern Ireland, along with comparisons to England, Scotland, Wales and the UK are presented below.

27 A copy of the main release and data tables is available at [Low carbon and renewable energy economy UK. Office for National Statistics website.](#)

28 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. In the UK in 2020, businesses whose primary activity was within the LCREE sector accounted for less than one third (31%) of all businesses active in the LCREE economy, over half (54%) of turnover and two-thirds (67%) of FTE employees. See [Direct activity in the Low Carbon and Renewable Energy Economy by business activity type 2020. Office for National Statistics website.](#) for further details.

29 Activity in the low carbon and renewable energy economy is spread across a wide range of industries. Many sectors are small but growing, and for many businesses, low carbon activity is secondary rather than primary activity. For this reason, estimates of the number of businesses are subject to particular volatility and are not considered here.



LCREE Headline Results by Region

Estimates from the LCREE 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 measurable sampling uncertainty, which has an effect on how changes in the estimates should be interpreted. Estimates of the level of uncertainty associated with all figures (coefficients of variation and confidence intervals) reported are presented in the published datasets to aid interpretation³⁰ and provided in the table below as examples for the 2020 year.

Table 2.1 LCREE Turnover (£billion) and employment (thousands FTEs) by UK Country, 2015 to 2020: estimate, lower confidence interval and upper confidence interval³¹

	Turnover (£billion)							
	2015	2016	2017	2018	2019	2020		
	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Lower CI	Upper CI
UK	40.2	41.4	44.0	46.3	44.1	41.2	38.6	43.9
England	32.0	32.2	35.3	37.1	35.1	32.6	30.0	35.1
Scotland	5.5	5.9	5.9	6.2	5.7	5.5	5.1	5.9
Wales	1.8	2.4	1.8	2.0	2.3	2.2	2.0	2.5
Northern Ireland	0.9	0.9	1.0	0.9	1.1	0.9	0.7	1.1

	Employment (thousands FTEs)							
	2015	2016	2017	2018	2019	2020		
	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Lower CI	Upper CI
UK	200.5	210.2	217.2	217.8	202.8	207.8	189.0	226.7
England	163.0	167.2	179.8	179.7	166.2	171.1	153.2	189.0
Scotland	22.8	24.0	21.8	22.3	21.7	20.5	16.8	24.1
Wales	10.2	12.9	9.7	10.9	9.4	11.3	9.4	13.2
Northern Ireland	4.4	6.2	5.9	5.0	5.5	5.0	3.9	6.1

Source: Office for National Statistics ([Data related to the low carbon and renewable energy economy, UK 2020. Office for National Statistics website.](#))

Direct Activity – Northern Ireland

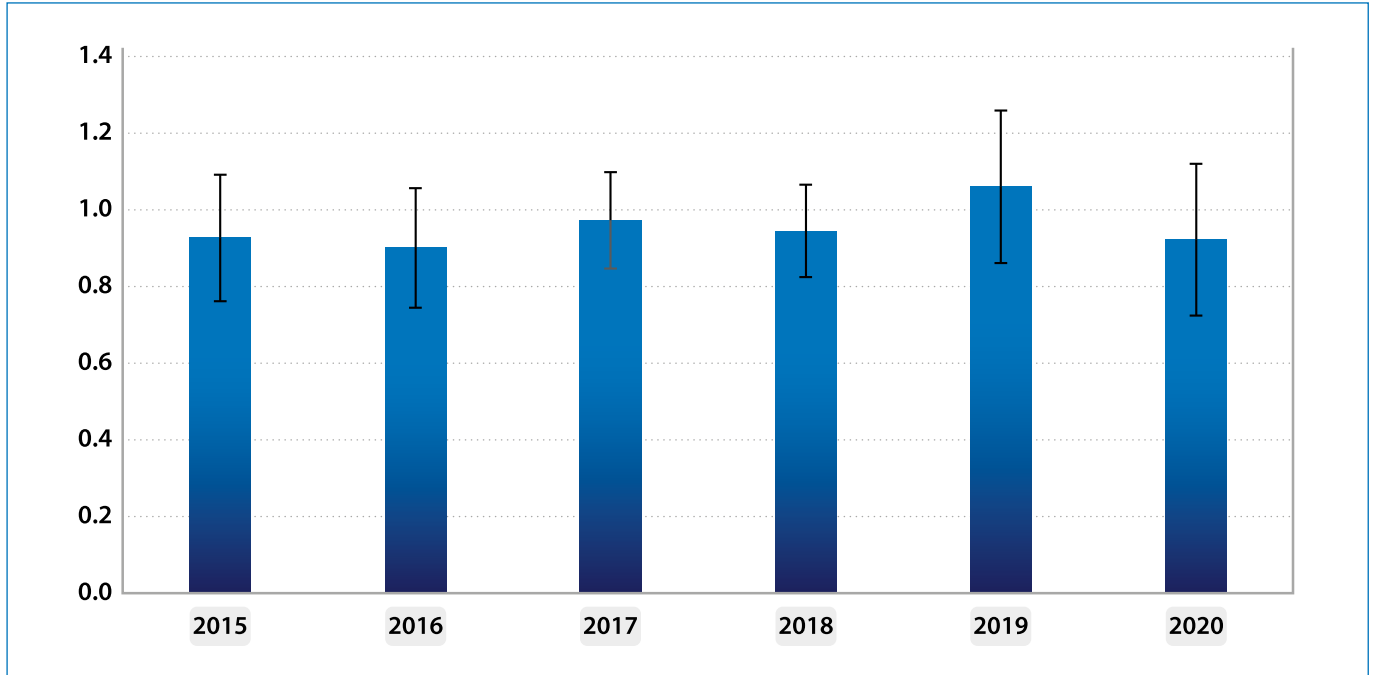
Table 2.1 shows that for Northern Ireland in 2020, around £0.9 billion in turnover and 5,000 full time equivalent (FTE) jobs were generated directly by businesses active in the LCREE economy. The table also highlights that estimates have been fairly steady over the period and, indeed, any changes in the estimates for turnover and employment for the UK and any region are not greater than the level that is explainable by sampling variability. That is, there has been no statistically significant change between 2015 and 2020: any changes are less than the level that is explained by sampling variability as shown by the upper and lower confidence intervals.

30 [Data related to the low carbon and renewable energy economy, UK 2020. Office for National Statistics website.](#)

31 Confidence intervals (CI) are a standard way of expressing the statistical accuracy of survey-based estimates. A 95% confidence interval is the range within which the true population value would fall for 95% of the time, if the survey was repeated.

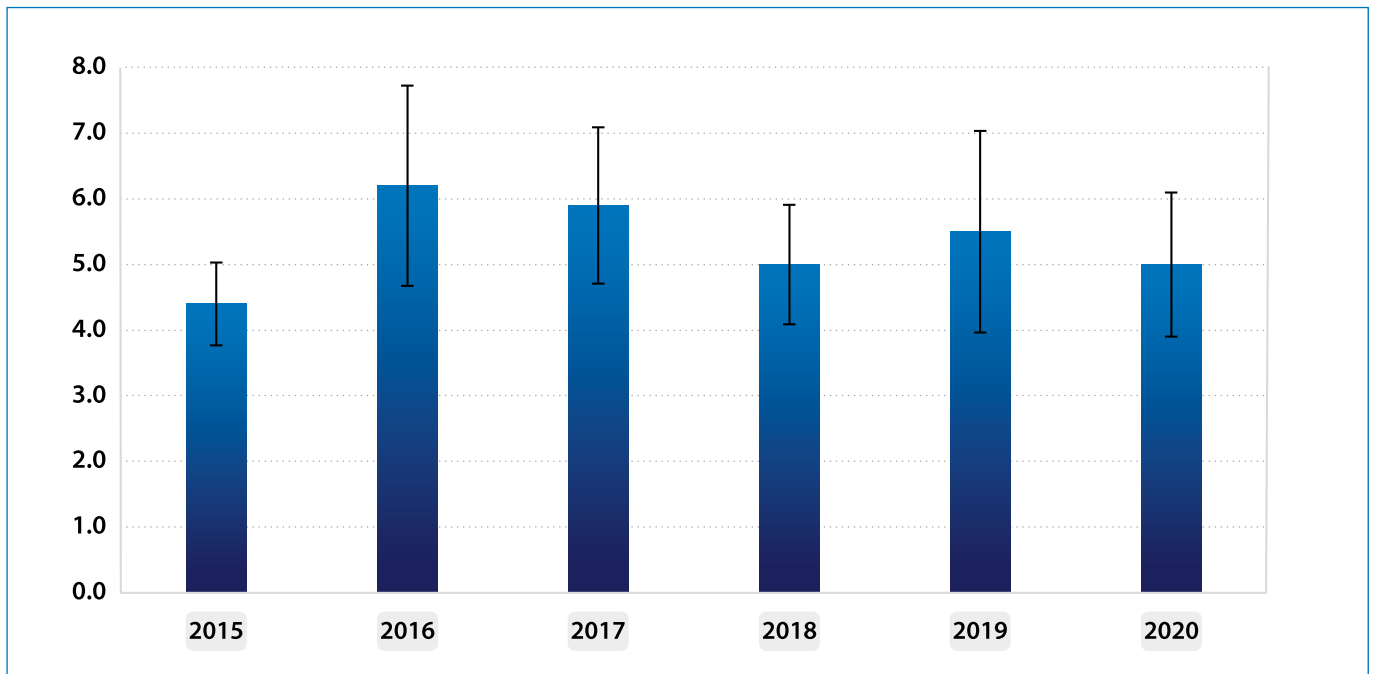


Chart 2.1 LCREE Turnover (£billion), Northern Ireland, 2015 to 2020: estimate with lower and upper confidence intervals shown



Source: Office for National Statistics ([Data related to the low carbon and renewable energy economy, UK 2020. Office for National Statistics website.](#))

Chart 2.2 LCREE Employment (thousands FTE), Northern Ireland, 2015 to 2020: estimate with lower and upper confidence intervals shown



Source: Office for National Statistics ([Data related to the low carbon and renewable energy economy, UK 2020. Office for National Statistics website.](#))



Charts 2.1 and 2.2 above show, for Northern Ireland, turnover and employment estimates respectively from the LCREE from 2015 to 2020 with the upper and lower confidence intervals included. This more clearly shows that, with overlapping confidence interval ranges for all years, there has been no statistically significant change between 2015 and 2020.

Regional Estimates

In each year 2015 to 2020, England accounted for around four-fifths of both direct UK LCREE turnover and UK LCREE direct full-time equivalent employment. Over the same period, businesses in Scotland engaged in LCREE activities provided some 13% of direct annual average UK LCREE turnover and around 10-11% of UK LCREE direct annual average employment.

In each year 2015 to 2020, businesses in Northern Ireland generated around 2.2% of direct UK LCREE turnover (e.g. £0.9 billion out of £41.2 billion in 2020) and provided about 2.4% of direct UK LCREE full-time equivalent employment (e.g. 5,000 out of 207,800 direct FTE employees in 2020). Direct LCREE annual average turnover and employment in Wales is generally around twice that of Northern Ireland.

LCREE 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 LCREE survey. Further details on which sectors fit into each group is detailed in Annex 2.1.

Table 2.2 Northern Ireland Direct Activity. LCREE Turnover (£million) and FTE Employment by Group, 2018 to 2020³²

	Turnover (£million)			Employees (FTE)		
	2018	2019	2020	2018	2019	2020
Low Carbon Electricity	302	218	247	900	500	500
Low Carbon Heat	*	51	29	100	300	200
Energy from Waste & Biomass	48	51	51	200	<100	400
Energy Efficient Products	248	411	354	2,100	3,100	2,700
Low Carbon Services	*	15	30	<100	<100	<100
Low Emission Vehicles	*	315	212	1,600	1,500	1,100
Total	945	1,060	922	5,000	5,500	5,000

Source: Office for National Statistics ([Data related to the low carbon and renewable energy economy, UK 2020. Office for National Statistics website.](#))

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 2.2.

The table shows that the Energy Efficient Products group was the largest contributor accounting for around two fifths of turnover and over half of FTE employees in 2020. The Low Carbon Electricity group accounted for just over one quarter of total Northern Ireland turnover but only 10% of FTE employees in 2020. The Low Emission Vehicles³³ group is an important sector in Northern Ireland with this group accounting for over one fifth of the total turnover and total FTE employees in Northern Ireland in 2020.

³² Cells in the table marked * are figures that have been suppressed to avoid disclosure of individual company details.

³³ Low Emission Vehicles group includes Low Emission Vehicles & Infrastructure and Fuel Cells & Energy Storage sectors.



Energy and the Wider Economy

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 Classification³⁴ 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. The SIC-based energy sector data presented below is based on a definition used by the Scottish Government³⁵. It will include activities such as mining and extraction (though there are relatively fewer 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

Table 2.3 overleaf shows that the total number of energy sector³⁶ enterprises in Northern Ireland increased from 260 in 2010 to 905 in 2021 (an almost three and a half fold increase). Over the same period, the total number of enterprises in Northern Ireland increased by 13%.

The major contributing factor to the overall rise in the number of energy sector enterprises is the large increase of the number of enterprises in the SIC 35 division 'Electricity, gas, steam and air conditioning supply': up from 50 in 2011 to 505 in 2021. Indeed, the majority of enterprises in this sector in 2019 (around 490 of the 505 businesses, or 97%) were in the SIC group 35.1: Electric power generation, transmission and distribution. There were over 12 times as many enterprises in this SIC group in 2021 (490) compared to ten years earlier (40 in 2011). This trend coincides with the large growth in recent years in the number of renewable electricity producers in Northern Ireland.

34 More information on the Standard Industrial Classification can be found at [UK Standard Industrial Classification of Economic Activities 2007. National Archives website.](#)

35 See page 1 of [Scottish Government growth sector statistics energy. Scottish Government website.](#)

36 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 Number³⁷ of Energy Enterprises³⁸ in Northern Ireland (March of each year), 2011 to 2021

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
SIC 05: Mining of coal and lignite	0	0	0	0	0	0	0	0	0	0	0
SIC 06: Extraction of crude petroleum and natural gas	0	0	0	5	0	0	0	0	0	0	0
SIC 09: Mining support service activities	0	5	5	10	15	10	5	5	10	10	10
SIC 19: Manufacture of coke and refined petroleum products	5	5	5	5	5	5	5	5	5	5	5
SIC 20.14: Manufacture of other organic based chemicals	0	0	0	0	0	0	0	0	0	0	0
SIC 35: Electricity, gas, steam and air conditioning supply	50	75	140	205	240	335	395	485	490	500	505
(SIC 35.1: Electric power generation, transmission and distribution)	40	65	125	195	225	315	375	460	470	480	490
SIC 36: Water collection, treatment and supply	10	5	10	10	5	10	10	10	15	15	20
SIC 38.22: Treatment and disposal of hazardous waste	0	0	5	0	0	0	0	5	5	5	5
SIC 71.12/2: Engineering related scientific and technical consulting activities	170	185	180	195	220	245	240	270	285	290	305
SIC74.90/1: Environmental consulting activities	25	25	30	30	45	45	50	60	45	50	55
Total Energy Sector³⁹	260	300	375	460	530	650	705	840	855	875	905
All Enterprises	67,960	67,490	66,690	66,650	67,050	69,095	70,715	73,120	74,565	75,180	76,700
Energy Sector as a Percentage of All Enterprises	0.4%	0.4%	0.6%	0.7%	0.8%	0.9%	1.0%	1.1%	1.1%	1.2%	1.2%

Source: Inter-Departmental Business Register, ONS⁴⁰

The table above shows that the energy sector accounted for 1.2% of all enterprises in 2021: the proportion has trebled over the 10-year period 2011 to 2021. Indeed, over the period 2011-2021 the average annual increase in the number of energy sector enterprises was 24.8% whilst the average annual increase for all enterprises in Northern Ireland was 1.3%.

37 Figures have been rounded to the nearest 5. * Counts under 5 have been suppressed.

38 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 an agreed or clearly defined 'renewables' classification using SIC.

39 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.

40 Data extracted from NOMIS ([Nomis Official Labour Market Statistics website](https://www.nomis.gov.uk/)) in November 2021.



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.

Table 2.4 Number of Energy Sector Enterprises and All Enterprises by Country, 2011 and 2021

Country	Enterprises in Energy Sector ⁴¹				All enterprises			
	2011	2021	Change	% Change	2011	2021	Change	% Change
England	10,440	21,490	11,050	106%	1,780,825	2,405,965	625,140	35%
Scotland	1,695	3,935	2,240	132%	144,650	175,400	30,750	21%
Wales	510	1,000	490	96%	87,430	107,085	19,655	22%
Northern Ireland	260	905	645	248%	67,960	76,700	8,740	13%
United Kingdom	12,120	27,005	14,885	123%	2,080,860	2,765,150	684,290	33%

Source: Inter-Departmental Business Register, ONS⁴²

The table above shows that Northern Ireland had the largest percentage increase in the number of energy sector enterprises over the 10-year period 2011 to 2021 (an increase of 248%). Indeed, this was around 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 (248% compared to 13%). In the UK, the number of energy sector enterprises increased by 123% compared to a 33% rise in the number of all enterprises.

Table 2.5 Energy Sector Enterprises as a Percentage of All Enterprises, 2011 and 2021

Country	Energy sector as % of All Enterprises	
	2011	2021
England	0.6%	0.9%
Scotland	1.2%	2.2%
Wales	0.6%	0.9%
Northern Ireland	0.4%	1.2%
United Kingdom	0.6%	1.0%

Source: Inter-Departmental Business Register, ONS⁴³

Table 2.5 shows the number of energy sector enterprises as a percentage of all enterprises for 2011 and 2021 respectively. Whilst Northern Ireland lagged behind the UK average and other UK countries in 2011 (NI was lowest at 0.4%), by 2021 energy sector enterprises as a proportion of all enterprises in Northern Ireland (at 1.2%) was slightly higher than the UK average and higher than Wales and England (both 0.9%). Scotland has by far the highest proportion with some 2.2% of all enterprises there located in the energy sector in 2021.

41 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.

42 Data extracted from NOMIS ([Nomis Official Labour Market Statistics website](https://www.nomis.gov.uk/)) in November 2021.

43 Data extracted from NOMIS ([Nomis Official Labour Market Statistics website](https://www.nomis.gov.uk/)) in November 2021.



Energy Sector Employment

The following table presents employee jobs data for the energy sector in Northern Ireland compared to the number of energy sector jobs in Great Britain (GB)⁴⁴.

Table 2.6 Employee Jobs in the Energy Sector⁴⁵ in Northern Ireland and GB, 2015, 2017 and 2019

	2015 NI	2017 NI	2019 NI	2015 GB	2017 GB	2019 GB
SIC 05: Mining of coal and lignite	0	0	0	2,000	1,250	1,500
SIC 06: Extraction of crude petroleum and natural gas	0	0	0	16,000	12,000	13,000
SIC 09: Mining support service activities	*	*	*	23,000	19,000	18,000
SIC 19: Manufacture of coke and refined petroleum products	*	*	*	8,000	9,000	9,000
SIC 20.14: Manufacture of other organic based chemicals	*	*	*	9,000	8,000	8,000
SIC 35: Electricity, gas, steam and air conditioning supply	1,843	1,828	1,779	124,000	134,000	130,000
SIC 36: Water collection, treatment and supply	*	1,226	*	34,000	37,000	42,000
SIC 38.22: Treatment and disposal of hazardous waste	0	*	*	7,000	7,000	7,000
SIC 71.12/2: Engineering related scientific and technical consulting activities	732	749	995	75,000	70,000	85,000
SIC 74.90/1 Environmental consulting activities	79	57	202	9,000	10,000	13,000
Total Energy Sector⁴⁶	2,654	3,860	2,976	307,000	307,250	326,500
All Employee Jobs	728,900	756,700	773,960	28,739,000	29,543,000	30,072,000
Energy Sector as Percentage of All Jobs⁴⁷	0.36%	0.51%	0.38%	1.08%	1.04%	1.09%

Sources: Business Register and Employment Survey: NISRA⁴⁸; Office for National Statistics⁴⁹

The table above shows that in GB, just over 1% of all employee jobs in 2015, 2017 and 2019 were in the energy sector. In Northern Ireland 0.36% of all employee jobs in 2015 were in the energy sector, 0.51% in 2017 and 0.38% for 2019. However, it should be noted that employee jobs data was not available for SIC 36 (Water collection, treatment and supply) for Northern Ireland in 2015 or 2019 but this data was available for 2017. As there are no figures for the number of jobs in SIC 36 in 2015 or 2019 and some other SICs, the actual change in the number of 'Total Energy Sector' jobs in Northern Ireland over time is unknown.

44 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.

45 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.

46 This is the sum of jobs for those sectors for which data is available and therefore is an approximation - data for some SICs in the Energy Sector are not available due to disclosure rules.

47 This is only an approximation for NI as data for some SICs in the Energy Sector are not available due to disclosure rules.

48 See [BRES Publications and Tables 2019. Northern Ireland Statistics and Research Agency website](#) for SIC breakdown tables.

49 GB data extracted from NOMIS ([Nomis Official Labour Market Statistics website](#)) in December 2021 and is rounded.



In GB, employee jobs data is available for every SIC within this Energy Sector definition. However, the table above shows that, for 2019, employee jobs data were not available for Northern Ireland in five sectors⁵⁰. This makes comparison against GB difficult. In particular, information for SIC 36 is not available for 2019 and we know there were over 1,200 employee jobs in that sector in 2017. For the other four sectors where information is not available (i.e. SICs 09, 19, 20.14 and 38.22), Table 2.3 earlier showed that very few businesses (20 at most) were operating in these sectors in Northern Ireland in 2019. Further analysis⁵¹ shows that these twenty or so businesses were all micro businesses (i.e. with employment in the 0 to 9 sizeband). Therefore, whilst the employee jobs information for each sector is not available we can deduce that the total number of jobs in those four missing sectors would be less than 200.

So, using an estimate of around 1,300 jobs from the missing sectors would give an estimated total energy sector employee jobs figure of 4,300 for Northern Ireland for 2019. This would then give an estimated 'Energy Sector as Percentage of All Jobs' figure for 2019 for NI of 0.56% which can therefore be compared against the figure for GB (1.09%) with the conclusion that, compared to GB, Northern Ireland has around half the proportion of jobs according to this definition of the energy sector.

These estimates and Table 2.6 also highlight that the majority of energy sector employee jobs in NI are concentrated in only a few industries, with SIC 35 (Electricity, gas, steam and air conditioning supply) accounting for about half of energy sector jobs and SIC 36 (Water collection, treatment and supply) another 30%.

Table 2.7 Employee Jobs in the Energy Sector⁵²: England, Scotland, Wales, Northern Ireland & GB, 2019

Country	Number of Employee Jobs in the Energy Sector	Total Number of Employee Jobs	Energy Sector Jobs as a Percentage of Total Jobs
England	241,850	26,302,000	0.92%
Scotland	67,900	2,501,000	2.71%
Wales	15,800	1,269,000	1.25%
Northern Ireland⁵³	2,976 (4,300)	773,960	0.38% (0.56%)
Great Britain	326,500	30,072,000	1.09%

Sources: Business Register and Employment Survey: NISRA⁵⁴; Office for National Statistics⁵⁵

The table above shows comparative data for England, Scotland and Wales alongside the data presented earlier for NI and GB, with all data relating to 2019. It shows that, for 2019, Northern Ireland had the lowest proportion of employee jobs in the energy sector across all the regions shown. As already shown, the GB proportion was around twice the NI figure. The proportion in Wales was more than twice that of NI, whilst the proportion in Scotland was around five times bigger.

50 That is SICs 09, 19, 20.14, 36 and 38.22.

51 Business count by sizeband data for 2019 extracted from NOMIS ([Nomis Official Labour Market Statistics website](#)) in February 2022.

52 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.

53 Figures in brackets are estimated figures as employee jobs information for all SICs are not available.

54 See [BRES Publications and Tables 2019. Northern Ireland Statistics and Research Agency website](#) for SIC breakdown tables.

55 Total jobs and SIC breakdowns for GB, England, Wales and Scotland were extracted from NOMIS ([Nomis Official Labour Market Statistics website](#)) in December 2021). Data are rounded and therefore may not add to totals. The level of rounding applied varies by estimate: please see article for further information on how rounding is applied ([BRES Rounding Rules. Nomis Official Labour Market Statistics website](#)).



Energy Sector Gross Value Added (GVA)

Table 2.8 below shows the available data for economic output of the energy industry⁵⁶, 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 2.8 Gross Value Added in the Energy Sector (£millions), Northern Ireland 2015-2020, UK 2019

	2015 NI	2016 NI	2017 NI	2018 NI	2019 NI	2020 NI	2019 UK
SIC 05: Mining of coal and lignite	*						*
SIC 06: Extraction of crude petroleum and natural gas		*					15,522
SIC 09: Mining support service activities	*	*	*	*	*	*	2,774
SIC 19: Manufacture of coke and refined petroleum products	*	*	*	*	*	*	2,453
SIC 20.14: Manufacture of other organic based chemicals	*	*	*	*	*	*	640
SIC 35: Electricity, gas, steam and air conditioning supply	306	387	403	559	656	1,059	26,441
SIC 36: Water collection, treatment and supply	*	*	*	*	*	*	9,403
SIC 38.22: Treatment and disposal of hazardous waste							316
SIC 71.12/2: Engineering related scientific & technical consulting activities	38	40	24	30	52	78	4,849
SIC 74.90/1 Environmental consulting activities	*	*	*	*	*	3	202
All Sectors GVA⁵⁷	20,432	21,826	22,025	23,882	25,330	25,683	1,285,468
Energy Sector GVA as Percentage of All Sectors GVA	1.7%	2.0%	1.9%	2.5%	2.8%	4.4%	4.9% (2.4%)

Source: Northern Ireland Annual Business Inquiry, NISRA⁵⁸; Annual Business Survey, ONS⁵⁹

56 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.

57 The NIABI and ABS cover the non-financial business economy. See [ABI sample coverage, Northern Ireland Statistics and Research Agency website](#) for more detailed information on the sectors covered by the NIABI.

58 NI data was provided by NISRA on request. 2020 data is provisional, 2019 and 2018 are revised.

59 From [Non financial business economy, UK: Sections A to S. Office for National Statistics website](#) and 5 digit SIC data provided by ONS. 2019 data is provisional.



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 limited⁶⁰. Indeed, as shown above, GVA data is available for only three of the ten SICs covered by the energy industry definition used (though in some sectors – e.g. SIC 05 and SIC 06 – there is no activity in Northern Ireland). Despite this, Table 2.3 earlier showed that 790 of the 875 energy enterprises in 2020 were in SIC 35 or SIC 71122, so the GVA information above, whilst limited, does cover 90% of all enterprises in the energy sector.

Table 2.8 shows that GVA in SIC 71122 (Engineering related scientific & technical consulting activities) was steady between 2015 and 2016 at around £40 million, fell back sharply in 2017 but has increased each year since to a high of £78 million in 2020. GVA in the ‘electricity, gas, steam and air conditioning supply’ sector has increased each year from 2015 to 2020, including a significant increase (by over 60% to over £1 billion) between 2019 and 2020.

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 the proportion of total GVA accounted for by GVA in the energy sector has been growing each year since 2017 to a high of 4.4% for Northern Ireland in 2020.

Table 2.8 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 4.9% of All Sectors GVA for the UK in 2019, significantly higher than the NI figure for the same year (2.8%). 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 UK⁶¹. This gives a comparable UK figure of 2.4%, which is slightly lower than the Northern Ireland proportion of 2.8%.

Energy Sector GVA per Head

The data above has shown that, for 2019, the energy sector accounted for about 1% of all enterprises, around 0.5% of all jobs but almost 3% 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: the table below shows this data.

Table 2.9 Gross Value Added Per Head in the Energy Sector, Northern Ireland 2015-2020, UK 2019

	2015 NI	2016 NI	2017 NI	2018 NI	2019 NI	2020 NI	2019 UK
SIC 35: Electricity, gas, steam and air conditioning supply	£163,046	£188,836	£155,339	£218,550	£249,226	£412,820	£183,618
SIC 71.12/2: Engineering related scientific & technical consulting activities	£47,000	£36,243	£29,555	£42,380	£62,917	£50,050	£56,384
All Sectors⁶²	£36,789	£38,951	£38,875	£42,050	£42,919	£44,260	£53,858

Source: Northern Ireland Annual Business Inquiry, NISRA⁶³; Annual Business Survey, ONS⁶⁴

60 Information is suppressed, and represented with an asterisk in the tables 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 2020 data for NI and 2019 data for UK in all tables are provisional and subject to revision.

61 That is SIC 35 and SIC 71.12/2.

62 See [ABI sample coverage. Northern Ireland Statistics and Research Agency website](#) for information on the sectors covered by the NIABI.

63 NI data was provided by NISRA on request. 2020 data is provisional, 2019 and 2018 are revised.

64 Calculated from [Non financial business economy, UK: Sections A to S. Office for National Statistics website](#) and 5 digit SIC data provided by ONS. 2019 data is provisional.



GVA per head in SIC 71122 for Northern Ireland was about 13% above the average for all sectors GVA for 2020 (though this has fluctuated above and below the all sectors average over the period shown). However, GVA per head in SIC 35 has consistently been much higher: around 4-5 times higher than the all sectors average between 2015 and 2018, 6 times higher in 2019 and over 9 times higher in 2020. Indeed, GVA per head in Northern Ireland for SIC 35 in 2019 was some 36% higher than 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 2019 in Northern Ireland was some 20% lower than the UK figure.

Energy Sector Turnover

Information on turnover (business income derived from sales of goods and services) is also available and is presented below.

Table 2.10 Turnover in the Energy Sector (£millions), Northern Ireland 2015-2020, UK 2019

	2015 NI	2016 NI	2017 NI	2018 NI	2019 NI	2020 NI	2019 UK
SIC 05: Mining of coal and lignite	*						*
SIC 06: Extraction of crude petroleum and natural gas		*					23,917
SIC 09: Mining support service activities	*	*	*	*	*	*	5,790
SIC 19: Manufacture of coke and refined petroleum products	*	*	*	*	*	*	38,541
SIC 20.14: Manufacture of other organic based chemicals	*	*	*	*	*	*	3,172
SIC 35: Electricity, gas, steam and air conditioning supply	1,917	1,906	2,011	2,402	2,814	2,301	104,271
SIC 36: Water collection, treatment and supply	*	*	*	*	*	*	15,267
SIC 38.22: Treatment and disposal of hazardous waste					*		954
SIC 71.12/2: Engineering related scientific & technical consulting activities	63	69	73	76	108	104	10,510
SIC 74.90/1 Environmental consulting activities	*	*	*	*	*	4	1,822
All Sectors Turnover⁶⁵	67,085	67,730	66,141	68,773	71,332	67,078	4,101,512
Energy Sector Turnover as Percentage of All Sectors Turnover	3.0%	2.9%	3.2%	3.6%	4.1%	3.6%	5.0% (2.8%)

Source: Northern Ireland Annual Business Inquiry, NISRA⁶⁶; Annual Business Survey, ONS⁶⁷

65 The NIABI and ABS cover the non-financial business economy See [ABI sample coverage. Northern Ireland Statistics and Research Agency website](#) for information on the sectors covered by the NIABI.

66 NI data was provided by NISRA on request. 2020 data is provisional, 2019 and 2018 are revised.

67 Calculated from [Non financial business economy, UK: Sections A to S. Office for National Statistics website](#) and 5 digit SIC data provided by ONS. 2019 data is provisional.



Like the GVA data presented previously, turnover information for Northern Ireland was available for only three of the ten SICs covered by the energy industry definition used. This shows that these three SICs accounted for 3.6% of total turnover in 2020 and 4.1% in 2019 (though information on only two SICs were available in 2019). In the UK as a whole in 2019, the same two SICs accounted for a lower proportion (2.8% of turnover). Data for nine of the ten SICs is available for the UK for 2019 and this showed that 5.0% of All Sectors Turnover in the UK was from these sectors.

Turnover was steady in the Electricity, gas, steam and air conditioning supply sector in NI over the period 2015-2017 averaging at around £2 billion each year but this increased in the period 2018-2020 to an average of around £2.5 billion in turnover each year in this sector in Northern Ireland, an increase of around 30%. Looking at All Sectors Turnover for Northern Ireland for the same periods shows a much smaller increase (3%), from about £67 billion average in 2015-2017 to just over £69 billion average for 2018-2020.



Annex 2.1 Low Carbon and Renewable Energy Economy (LCREE) Scope

The LCREE 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.
Other Energy efficient products	The design, manufacture and installation of energy efficient products. Examples include: <ul style="list-style-type: none"> -Energy efficient doors and windows -Heating and ventilation, such as condensing boilers, ventilation and heating recovery -Insulation such as loft, external wall, roof insulation -Reducing energy consumption for heat or air conditioning by minimising 'leakage' of heat -Energy efficient building materials or technologies -Sustainable buildings and architecture -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 Exclude: 'Smart' goods such as TVs and freezers.
Energy monitoring, saving or control systems	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: <ul style="list-style-type: none"> -Smart heating controls -Energy management systems -Condensation control -Energy management software -Control system components
Low carbon financial and advisory services	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. Include: environmental and/or energy consultants
Low emission vehicles and infrastructure	Design and manufacture of vehicles with specific technology to significantly reduce or remove emissions. Include: hybrid vehicles, electric vehicles, fuel cell vehicles or other technologies. Exclude: small efficiency improvements such as lighter bodywork or aerodynamics. Fuel efficient, conventional vehicles are also excluded.
Carbon capture and storage	Capturing waste CO ₂ 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.
Nuclear power	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.
Fuel cells and energy storage systems	The design, manufacture and installation of energy storage systems, flywheel energy storage, fuel cells, batteries and any other form of energy storage system.



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 2.2

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.

The CV information is available for each year and published by the Office for National Statistics (ONS) ([Low carbon and renewable energy economy estimates. Office for National Statistics website](#)).

	Coefficient of Variation (CV)					
	Turnover (£million)			Employees (FTE)		
	2018	2019	2020	2018	2019	2020
Low Carbon Electricity	18%	19%	25%	38%	51%	32%
Low Carbon Heat	*	43%	24%	24%	46%	51%
Energy from Waste & Biomass	28%	35%	55%	45%	24%	47%
Energy Efficient Products	12%	19%	21%	14%	24%	18%
Low Carbon Services	*	21%	65%	28%	14%	24%
Low Emission Vehicles	*	0%	2%	2%	2%	3%
Total	7%	10%	11%	9%	14%	11%

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. Estimates with CVs that are greater or equal to 20% should be used with caution.

Chapter 3: **Electricity**



Chapter 3: Electricity

Summary of Key Points

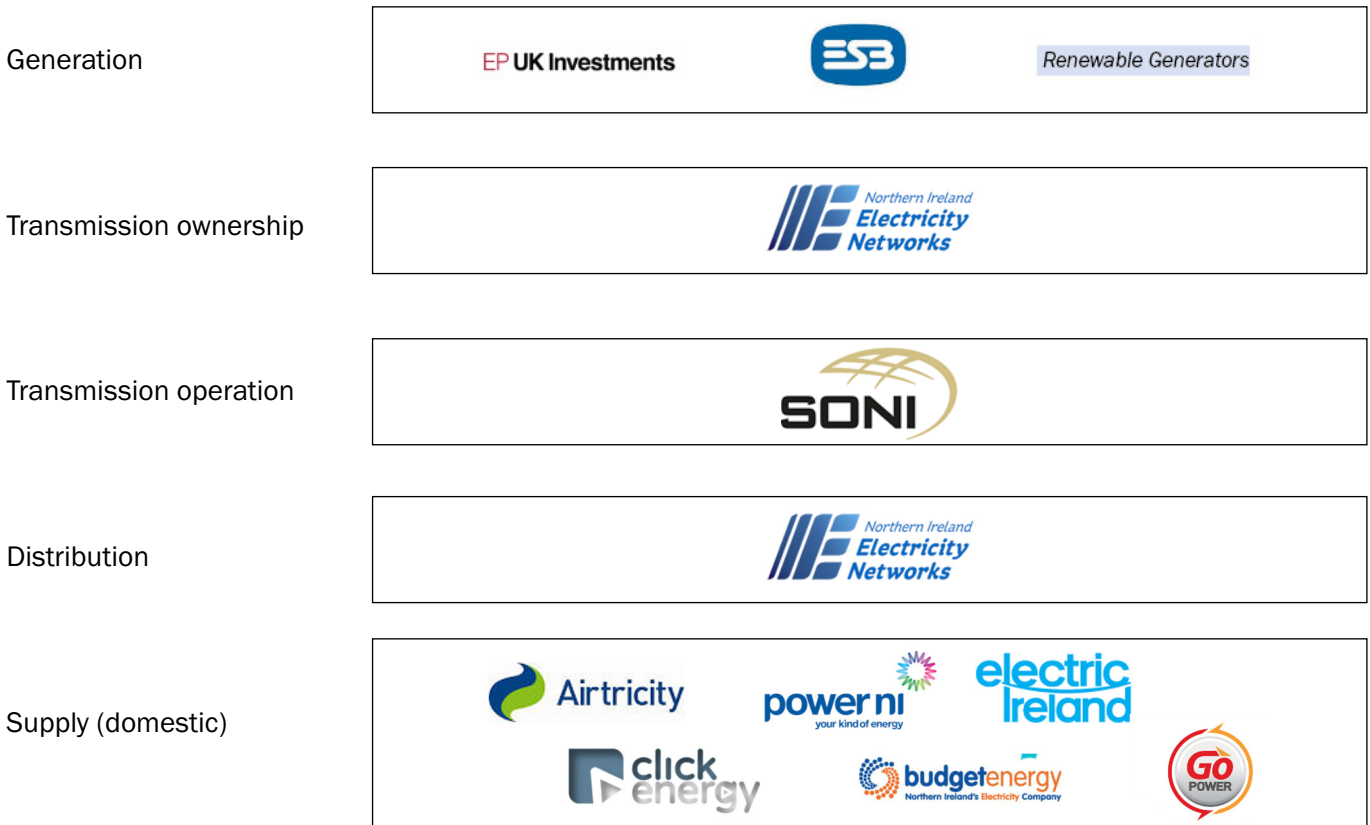
- At May 2022, Northern Ireland had three major fossil-fuel based electricity-generating plants and a number of renewable generators, which make up indigenous electricity production. Interconnection with Ireland and Scotland help to maintain security of supply.
- As expected, electricity consumption peaks during the winter months and is at its lowest during the summer months. Monthly consumption in Northern Ireland peaked in December 2010 (at around 837 GWh) with the lowest level recorded in April 2020 at under 533 GWh (36% below peak monthly consumption and reflecting the impacts of Covid-19).
- In general, there was a slight downwards trend in annual electricity consumption in Northern Ireland over the period 2010-2015 followed by little change over the period 2015-2019. Consumption in 2020 then fell by 4% compared to 2019, largely due to falls in non-domestic consumption arising from the first lockdown during the coronavirus pandemic. Total consumption in 2021 (7,574 GWh) was over 10% lower than in 2010.
- Average annual domestic electricity consumption per meter ranged from 3,000 kWh in Belfast to 4,300 kWh in Mid Ulster District Council area in 2020-21, meaning consumption per meter in this council area is around 40% higher than Belfast and some 16% above the Northern Ireland average.
- Whilst some 92% of all electricity meters were in domestic properties at the end of 2021, the domestic sector accounted for less than two-fifths (39.3%) of total electricity consumption in 2021. Large consumption by a relatively small number of consumers is illustrated by the fact that just over 1% of the largest consuming non-domestic electricity consumers accounted for over half (51%) of total electricity consumption in 2021.
- In 2021, Northern Ireland was a net exporter in terms of electricity trades with Ireland (via the North-South tie-lines). Northern Ireland exported more than was imported in each year 2017 to 2021 with exports to Ireland in 2021 (1,417 GWh) at their highest level since 2006.
- In 2021, Northern Ireland was a net importer of electricity from Scotland (via the Moyle interconnector). Indeed, electricity transfers from Scotland in 2021 (1,637 GWh) were at their highest level since 2012.
- In 2021 (and indeed, each year since 2016), Northern Ireland was able to meet all (or the overwhelming majority of) its own electricity demands without relying on imports or transfers of electricity from other countries and indeed was a net exporter of electricity in three of the six years in this period.



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 as at 1st March 2022 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 follows⁶⁸:

- Ballylumford (gas fuelled⁶⁹) is located at the tip of the Islandmagee peninsula, is owned by EP UK Investments and is Northern Ireland’s largest power station with an installed capacity of over 730 MW.
- Coolkeeragh (gas fuelled⁷⁰) is located in Londonderry, is owned by ESB and has an installed capacity of around 470 MW.
- Kilroot (mainly coal and oil fuelled⁷¹) is located in Carrickfergus and is owned by EP UK Investments and has an installed capacity of some 700 MW.

68 The capacities for each power station are taken from Table 5.11 of the [Digest of United Kingdom Energy Statistics 2021, Gov. uk website](#). Please note that installed capacities are subject to change from year to year.

69 Ballylumford provides 616 MW capacity from natural gas generation with a further 116 MW capacity from diesel/gas oil generation.

70 Coolkeeragh provides 413 MW capacity from natural gas generation with a further 53 MW capacity from diesel/gas oil generation.

71 Kilroot provides 559 MW of capacity from coal fuelled generation, alongside 143 MW from diesel/gas oil generation.



In addition to the major gas/coal/oil fuelled power stations, Northern Ireland also has renewable energy sources (capacity of over 1,270 MW⁷² from wind alone). There is also interconnection with the Scottish grid, with two 250 MW lines on the Moyle Interconnector⁷³ and interconnection with the grid in Ireland via three tie-lines with over 400 MW combined capacity⁷⁴. Electricity can be imported and exported via the Moyle Interconnector and North-South tie-lines.

Transmission

Transmission 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. In Northern Ireland, NIE Networks operates the distribution network which transports electricity to over 905,000 customers⁷⁵ 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 electricity 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 Markets⁷⁶

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.

The Single Electricity Market (SEM)

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

72 As at September 2021, figures from SONI (see report [on EirGrid website](#)).

73 While Moyle is technically able to transport 500MW between the two markets, due to constraints on the transmission networks at either end of the interconnector, the commercial capacity of the interconnector is lower than this. See [Mutual Energy website](#) for further details on capacity.

74 As detailed in [Cross-border interconnection, Department for the Economy website](#). Capacity is 340MW North to South and 440MW South to North.

75 At end December 2021 as per Utility Regulator's Retail Energy Market Monitoring report for Q4 2021 (see page 6 at [Utility Regulator website](#)).

76 Information on Wholesale Markets, SEM and I-SEM taken mainly from the SEM Committee's 'Quick Guide to the I-SEM' – available [on SEM Committee website](#).



The operation of a 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 supply⁷⁷.

The New Market – the I-SEM

Much has changed since the SEM was introduced in 2007. In particular, there is now much 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 was replaced by the I-SEM which went live on 1st October 2018⁷⁸. There are several key differences between the SEM and I-SEM market designs as shown in Figure 3.2 below:

Figure 3.2 Key Differences between the SEM and I-SEM

	SEM	I-SEM
Market Structure	One pool and timeframe	Different markets with different timeframes
Trading opportunities	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).
Setting the market price	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 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.
Balancing supply and demand	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, their suppliers or generators are liable for these costs in the balancing market.
	SEM	I-SEM
Capacity payments to generators	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.
Trading across interconnectors with Great Britain	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 Committee⁷⁹

77 For more information see [SONI website](#)

78 For more information, see [New all-island wholesale electricity market goes live. SEM Committee website](#)

79 Information taken from page 6 of the SEM Committee's 'Quick Guide to the I-SEM' available at [SEM Committee website](#)



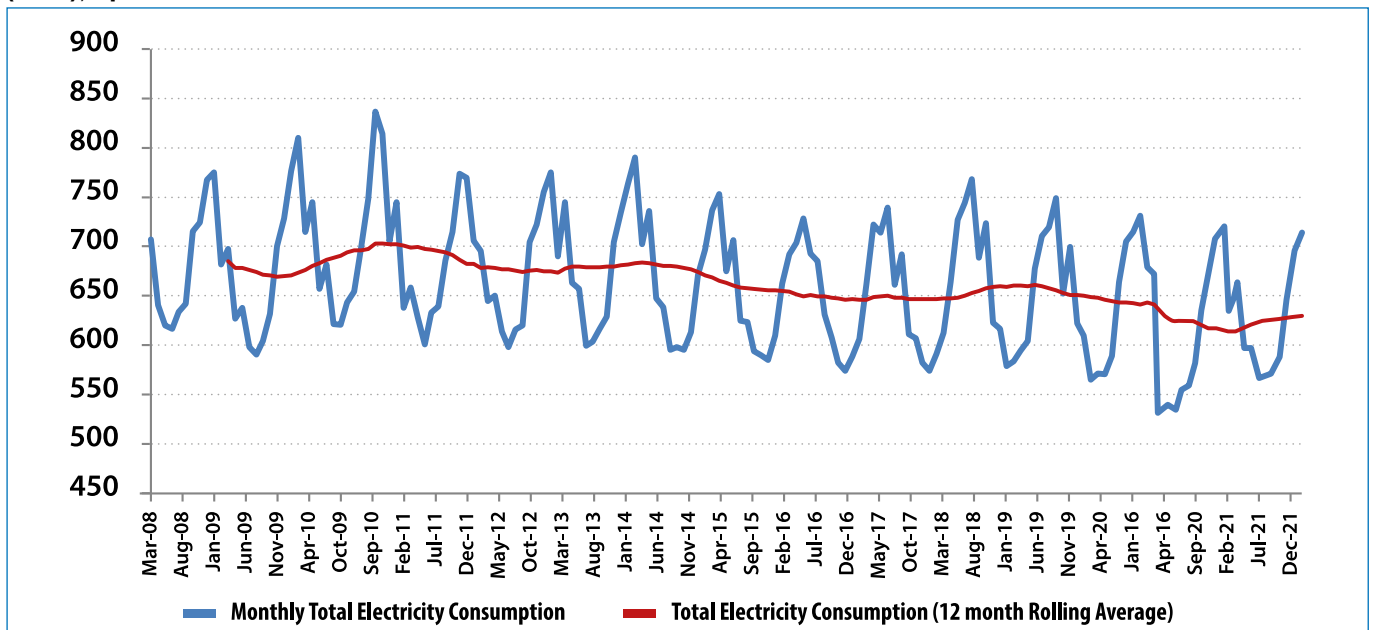
Benefits of I-SEM⁸⁰

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, geographical location meant that electricity prices were, historically, higher in the all-island market than in Great Britain (though, as Chapter 6 shows, this is no longer the case). The better way of allocating power across the 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.

Electricity Consumption – Monthly

DfE Analytical Services Unit publishes electricity consumption data for Northern Ireland quarterly as part of their Electricity Consumption and Renewable Generation in Northern Ireland publication⁸¹. 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 December 2021.

Chart 3.1 Monthly Total Electricity Consumption and 12-Month Rolling Average Consumption in Northern Ireland (GWh), April 2008 to December 2021



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 December 2021. This shows an overall downwards trend in electricity consumption over the period, particularly since the start of 2011 when the rolling average was around 700 GWh and fell to around 625 GWh in 2020 (though the average has increased slightly throughout 2021).

80 Information taken from page 9 of the SEM Committee’s ‘Quick Guide to the I-SEM’ available at [SEM Committee website](#)
 81 See [Electricity Consumption and Renewable Generation Statistics, Department for the Economy website](#) for further details on this publication.

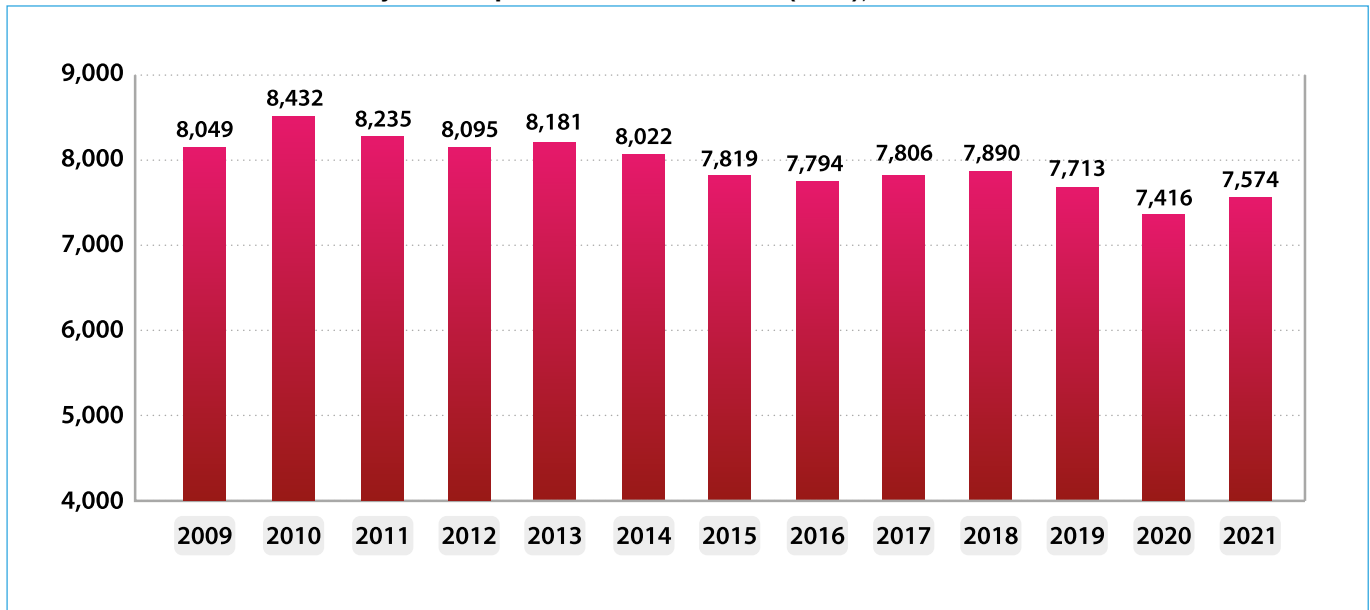


It is clear to see the impact of the first lockdown of the coronavirus pandemic on electricity consumption with the lowest monthly consumption figures on record being in early-mid 2020. The chart also shows that monthly consumption peaked in December 2010⁸² (at about 837 GWh) and the lowest level recorded over the period was in April 2020 (less than 533 GWh and over 36% below peak monthly consumption).

Electricity Consumption – Annual

The chart below shows total annual electricity consumption for Northern Ireland for each year 2009 to 2021.

Chart 3.2 Total Annual Electricity Consumption in Northern Ireland (GWh), 2009 to 2021



Source: NIE Networks

Electricity consumption in 2021 (7,574 GWh) was the second lowest in the thirteen years shown (and around 6% lower compared to 2009). Over the 13 year period, consumption peaked in 2010 (8,432 GWh), there was then a slight downwards trend over the period 2010-2015 (though there was a slight rise in consumption between 2012 and 2013) followed by little change over the period 2015-2019. Consumption in 2020 then fell by 4% compared to 2019, largely due to falls in non-domestic consumption arising from the first lockdown during the coronavirus pandemic. Indeed, reflecting the impacts of Covid-19, the five lowest monthly electricity consumption volumes on record were recorded between April and August 2020. Annual consumption in 2021 was over 10% lower than the peak in 2010.

There are a number of factors which may have contributed to the reduction in consumption over the period 2010-2015, 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 consequences of the post 2008 recession, changes in the building stock and household composition.

82 The winter of 2010/2011 saw record-breaking low temperatures in Northern Ireland. For example, see [Recalling Northern Ireland's big freeze of 2010. BBC News website](#)



Sub-National Electricity Consumption

The Department of Business, Energy and Industrial Strategy (BEIS) produce data in relation to domestic and non-domestic electricity consumption at a District Council level⁸³ for Northern Ireland. The latest year available is for 2020-21⁸⁴ and results are provided for the 11 council areas as shown in Table 3.1 below.

Table 3.1 Electricity Consumption Statistics at District Council Level, 2020-21

Council name	Domestic			Non-domestic		
	Total consumption (GWh)	Total number of meters	Average consumption per meter (kWh ⁸⁵)	Total consumption (GWh)	Total number of meters	Average consumption per meter (kWh)
Antrim & Newtownabbey	234	63,647	3,676	332	4,130	80,392
Ards & North Down	282	75,867	3,715	183	4,847	37,774
Armagh City, Banbridge & Craigavon	357	90,030	3,965	529	7,347	71,942
Belfast	505	165,019	3,061	827	13,681	60,482
Causeway Coast & Glens	255	67,723	3,758	226	5,630	40,215
Derry City & Strabane	231	65,108	3,550	406	5,373	75,496
Fermanagh & Omagh	194	49,995	3,877	321	5,077	63,258
Lisburn & Castlereagh	242	64,233	3,767	241	4,363	55,337
Mid & East Antrim	234	62,887	3,729	248	4,622	53,698
Mid Ulster	245	57,243	4,283	476	6,348	74,933
Newry, Mourne & Down	304	74,520	4,081	283	6,689	42,317
Unallocated⁸⁶	6	2,628	2,273	16	190	82,403
NI Total	3,089	838,900	3,682	4,088	68,297	59,861

Source: BEIS ([Sub-national electricity consumption statistics in Northern Ireland, Gov.uk website.](#))

83 See [Sub-national electricity consumption statistics in Northern Ireland, Gov.uk website.](#) This data was previously classed as experimental but is now Official Statistics.

84 This covers the financial year 1 April 2020 to 31 March 2021.

85 1 GWh = 1,000,000 kWh

86 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.



For domestic consumption, data are based on billed units from customers that have been connected for at least 12 months⁸⁷ with non-domestic consumption based on billed units (and relate to final consumption at the point when it was derived) and covers the period 1 April 2020 to 31 March 2021. Therefore, the consumption figures will not match exactly with those shown for 2020 in Chart 3.2 earlier (total consumption in Table 3.1 above is some 7,177 GWh compared to total consumption of 7,416 GWh for 2020 as shown in Chart 3.2, a difference of around 3%).

As the table shows, average domestic consumption per meter in 2020-21 ranged from about 3,000 kWh in Belfast to around 4,300 kWh in Mid Ulster District Council area, although consumption for most district council areas was close to the NI average of around 3,700 kWh. Domestic consumption per meter in Mid Ulster is some 40% higher than Belfast and 16% above the Northern Ireland average, whilst domestic consumption in Belfast was some 17% below the Northern Ireland average. The lower domestic consumption per meter in Belfast council area may be due to 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 and demographic mix in council areas.

Predictably, given the concentration of domestic dwellings and businesses, Belfast City Council area has the largest share of both domestic consumption (over 16%) and non-domestic consumption (over 20%). Indeed, Belfast City Council area and Armagh, Banbridge & Craigavon Council area together accounted for one-third of all non-domestic electricity consumption in Northern Ireland in 2020-21.

Domestic Versus Non-Domestic Consumption – Northern Ireland

Table 3.1 above also highlighted that, while 92.5% of all meters in 2020-21 were in domestic properties, the domestic sector accounted for just over two-fifths (43%) of total electricity consumption. Information from different sources (presented in Table 3.2 below), shows a similar split between the domestic and non-domestic sectors in terms of connections (92% and 8% respectively) and consumption (39% and 61% respectively) in the same years. The data below also provides domestic and non-domestic data split into further consumer categories.

87 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.



Table 3.2 Electricity Connection Numbers and Electricity Consumption by Market Segment in Northern Ireland, 2018 to 2021

Market Segments	Connection Numbers				Annual Consumption (GWh)			
	At end 2018	At end 2019	At end 2020	At end 2021	2018	2019	2020	2021
Domestic:								
Domestic Credit	448,883	449,844	452,222	453,924	1,667	1,627	1,646	1,700
Domestic Prepayment	359,262	366,211	370,957	375,452	1,228	1,221	1,239	1,276
Total Domestic	808,145	816,055	823,179	829,376	2,895	2,849	2,885	2,976
Non-Domestic (Industrial & Commercial):								
I&C < 20 MWh	49,079	50,721	53,212	53,643	349	342	327	335
I&C 20 - 49 MWh	13,117	12,937	11,669	12,109	429	420	390	385
I&C 50 - 499 MWh	10,053	9,934	8,220	9,117	1,334	1,312	1,171	1,179
I&C 500 - 1,999 MWh	841	817	714	764	807	799	718	730
I&C 2,000 - 19,999 MWh	253	268	231	243	1,337	1,303	1,253	1,247
I&C ≥ 20,000 MWh	19	18	16	18	739	688	670	722
Total Industrial & Commercial (I&C)	73,362	74,695	74,062	75,894	4,995	4,864	4,528	4,599
Total (Domestic + I&C)	881,507	890,750	897,241	905,270	7,890	7,713	7,413	7,574
% Domestic	91.7%	91.6%	91.7%	91.6%	36.7%	36.9%	38.9%	39.3%
% Non-domestic	8.3%	8.4%	8.3%	8.4%	63.3%	63.1%	61.1%	60.7%

Sources: Northern Ireland Utility Regulator ([Market Information, Utility Regulator website](#)) and data provided directly to DfE by NIE Networks⁸⁸

What is clear from the table above is the impact on electricity connections and consumption in 2020 due to lockdowns during the Covid-19 pandemic. Connection numbers have been rising year-on-year for both the domestic and non-domestic sector for many years, but there was a small fall in total non-domestic connections between 2019 and 2020 (a fall of around 600 or 0.8%). Some changes within the non-domestic sector were significant. In the lowest consuming non-domestic group (I&C < 20 MWh) connection numbers rose by 5% but fell by 10% or more in all other non-domestic consumption groups between 2019 and 2020. This is likely to have been the result of some businesses closing but more so movement of firms from a higher to a lower consumption band due to an inability to continue normal business during the lockdowns.

In terms of consumption between 2019 and 2020, the domestic sector saw a rise of over 1% but in the non-domestic sector, consumption fell by almost 7%. This is very likely to be a result of a reduction in economic activity and a large increase in working from home during the lockdown period. Consequently, the proportion of total electricity consumption from the domestic sector rose from less than 37% in 2018 and 2019 to 39% for 2020 and 2021.

Looking at the most up-to-date annual figures for 2021, Table 3.2 also shows that the bigger industrial and commercial (I&C) users consume a disproportionate amount of electricity. For example, those I&C customers who consumed 2,000 MWh or more of electricity in 2021 accounted for just 0.3% of all I&C connections but were responsible for more than two fifths (43%) of non-domestic consumption in 2021.

⁸⁸ Note that long term vacant sites are not included in connection numbers and combined premises are included in the <20MWh category.



Indeed, a very small number of the largest energy users (i.e. those 18 customers who consumed more than 20,000 MWh of electricity in 2021) were responsible for around 16% of I&C consumption and 9.5% of the total volume of electricity consumption (both domestic and non-domestic) in Northern Ireland in 2021.

In the domestic sector, there was an increase of around 6,200 customers between 2020 and 2021: this was made up of a 1.2% rise in prepayment customers (+4,500) and a 0.4% rise in credit customers (+1,700). Overall, using the data in Table 3.2, domestic customers in Northern Ireland consumed on average about 3,600 kWh of electricity in 2021 (an average of around 3,750 kWh for credit customers and an average of about 3,400 kWh for prepayment customers).

In the non-domestic sector in 2021, 86.6% of connections were in the consumption less than 50 MWh per annum groups and 98.6% of connections were in the consumption less than 500 MWh per annum groups. There was an increase of 1,832 connections between 2020 and 2021 in the non-domestic sector, with all six non-domestic groups showing an increase in connection numbers.

Domestic Versus Non-Domestic Consumption – Regional Comparisons

Similar information for Great Britain and its regions is published by BEIS⁸⁹. As shown in Chart 3.3 below, the split between domestic and non-domestic electricity consumption for GB as a whole was different to that for Northern Ireland in 2020, with a higher percentage of electricity in GB consumed in the domestic sector (42%) and a lower proportion (58%) in the non-domestic sector (but a similar 92% of meters in the domestic sector and 8% in the non-domestic sector for GB in 2020⁹⁰).

However, as shown in the chart, the split varies across the regions of Great Britain. Domestic consumption accounted for 37% of total electricity consumption in Wales but was 47% in the South West region. Indeed, the variation is even more marked across GB local authorities (equivalent to NI council areas). For example, in 2020, domestic consumption made up less than 20% of total electricity consumption in five local authorities (City of London, Westminster, Neath Port Talbot, Slough and Tower Hamlets) and as much as 71% in one local authority (East Renfrewshire)⁹¹. The share between domestic and non-domestic consumption 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.

In addition⁹², average annual domestic electricity consumption in GB (around 3,750 kWh) was some 7% higher than that in Northern Ireland (at 3,500 kWh using data for 2020 for Northern Ireland from Table 3.2). In GB regions, average annual domestic electricity consumption in 2020 ranged from about 3,170 kWh in the North East region to 4,160 kWh in the East England region. Scotland (3,520) and Wales (3,543) had similar consumption values to Northern Ireland for 2020.

89 Full publication can be accessed at [Sub-national electricity and gas consumption summary report 2020. Gov.uk website.](#)

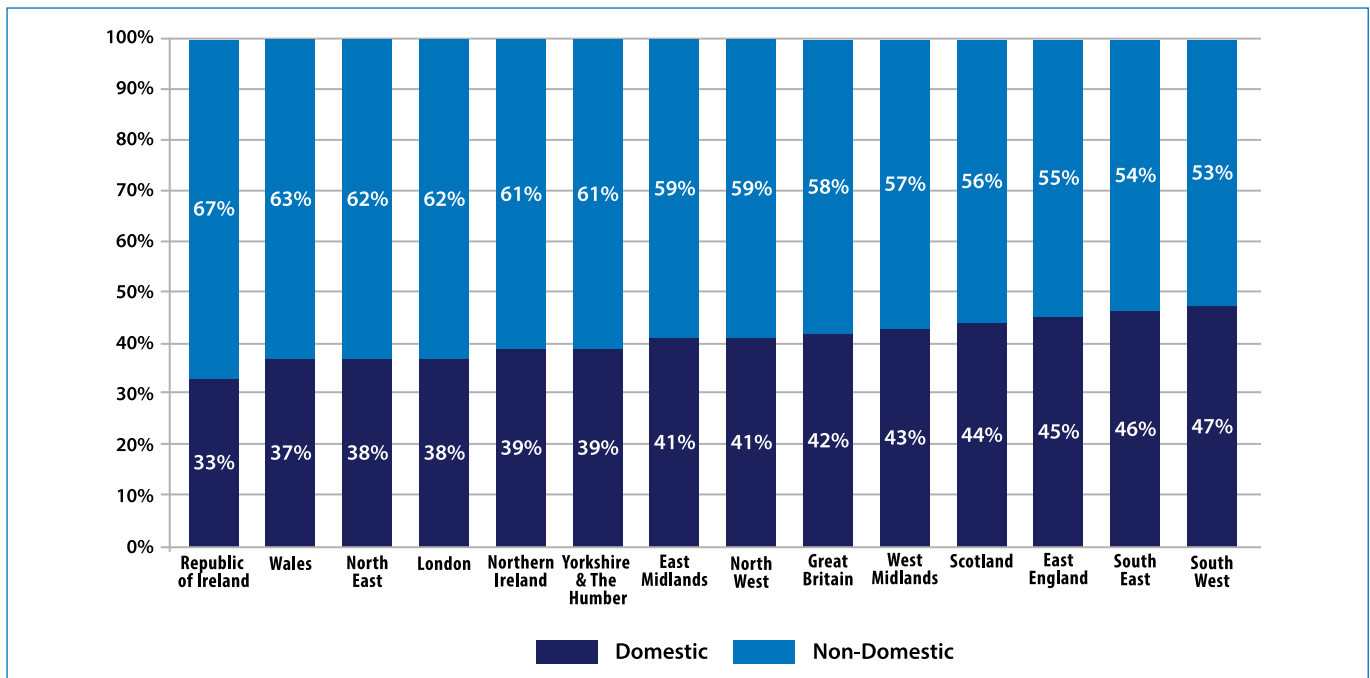
90 Calculated from data published by BEIS, available at [Stacked electricity consumption statistics data. Gov.uk website.](#)

91 Calculated from data published by BEIS, see local authority data at [Gov.uk website.](#)

92 From page 9 of BEIS publication at [Assets publishing service. Gov.uk website.](#)



Chart 3.3 Distribution of Domestic/Non-Domestic Electricity Consumption by Country and Region, 2020



Sources: BEIS⁹³; NIE Networks; Commission for Regulation of Utilities

The domestic/non-domestic electricity consumption splits were markedly different in 2020 compared to previous years with a higher proportion of total electricity consumption coming from domestic consumption in 2020. The proportions for Northern Ireland changed from 63% non-domestic in 2019 to 61% in 2020. There were similar and indeed larger changes in GB and its regions. As noted in the BEIS report⁹⁴, “the COVID-19 pandemic was probably a key factor driving the changes in the electricity consumption between 2019 and 2020. The record year-on-year fall in non-domestic consumption is likely to be linked to a reduction in economic activity and an increase in working from home. The increase in domestic consumption (which has been falling each year up until now) is likely to be linked to increased time spent at home during the lockdowns, as well as an increase in working from home”. The splits for Ireland showed similar changes: 67% non-domestic, 33% domestic in 2020 compared to 69% non-domestic, 31% domestic in 2019.

The data published by the Commission for Regulation of Utilities⁹⁵ for Ireland for 2020 shows much higher proportion of electricity consumed in Ireland (67%) for non-domestic purposes compared to Northern Ireland (61%). In 2020, domestic electricity consumption in Ireland was some 9,282 GWh (accounting for 33% of all electricity consumption and equivalent to over three times the domestic consumption in Northern Ireland in 2020) and non-domestic consumption was almost 18,634 GWh in Ireland and equivalent to over four times the non-domestic electricity consumption in Northern Ireland for 2020.

93 [Sub-national electricity and gas consumption summary report 2020. Gov.uk website.](#)

94 From page 5 at [Subnational electricity and gas consumption summary report 2020. Gov.uk website.](#)

95 See Table 18, page 71 in [Energy Water Monitoring Report 2020. Commission for Regulation of Utilities website.](#)



Electricity Flowchart

The flowchart overleaf (Chart 3.4) produced by BEIS⁹⁶ shows the relationship between generation and consumption of electricity in each of the UK countries by means of a Sankey flow diagram. Further details on generation and supply totals for the UK and its regions can be found in Annex 3.2.

The flowchart shows that, for Northern Ireland, indigenous generators produced 9,671 GWh of electricity in 2020. Of this, 339 GWh was for their own use resulting in 9,332 GWh net electricity supplied by indigenous generators to the public supply system. Net imports from Scotland were 296 GWh, but there were also net exports of 753 GWh to Ireland, so taking these into account means a total of 8,876 GWh of electricity supplied in Northern Ireland. However, 671 GWh of this was taken up through transmission and distribution losses⁹⁷ which leaves a total of 8,205 GWh of total consumption. Of this total consumption, 1,583 GWh was consumption by autogenerators⁹⁸ (see below and Annex 3.2 for more details) meaning 7,051 GWh was the derived figure for electricity ‘consumption from public supply’⁹⁹ for Northern Ireland.

The Sankey flowchart (and table in Annex 3.2) highlights the fact that England was reliant on imports of electricity from Continental Europe (17,752 GWh), Scotland (19,050 GWh) and Wales (2,878 GWh) to meet demand in 2020. These imports were equivalent to about one sixth of electricity consumption in England in 2020. As noted above, Northern Ireland was a net exporter of electricity in 2020: 296 GWh net imports from Scotland but 753 GWh net exports to Ireland.

Scotland was a significant net exporter of electricity in 2020. Net exports from Scotland to England (19,050 GWh) and also Scotland to Northern Ireland (296 GWh) were together equivalent to around half (48%) of net electricity supplied by Major Power Producers in Scotland in 2020. Wales was also a net exporter to England in 2020 (2,878 GWh and equivalent to 16% of net electricity supplied by Major Power Producers in Wales in 2020) although the net volume transferred to England in 2020 was less than half that supplied in 2019 and indeed was the lowest since the series began in 2004. Wales started trading with Ireland in 2012 and was a net exporter to them each year, with some 5,600 GWh (net) of electricity exported to Ireland in the three year period 2013-2015. However, in 2016 (and each year since) Wales received more imports of electricity from Ireland than it exported with net imports of 911 GWh of electricity in 2020.

Northern Ireland was a net exporter of electricity to Ireland between 2004 and 2013 (see Table 3.4) and a net importer from Ireland between 2014 and 2016 (though net imports were small in each of these three years) before returning to being a net exporter between 2017 and 2021.

96 [Regional Electricity Generation and Supply 2016-2020. Gov.uk website.](#)

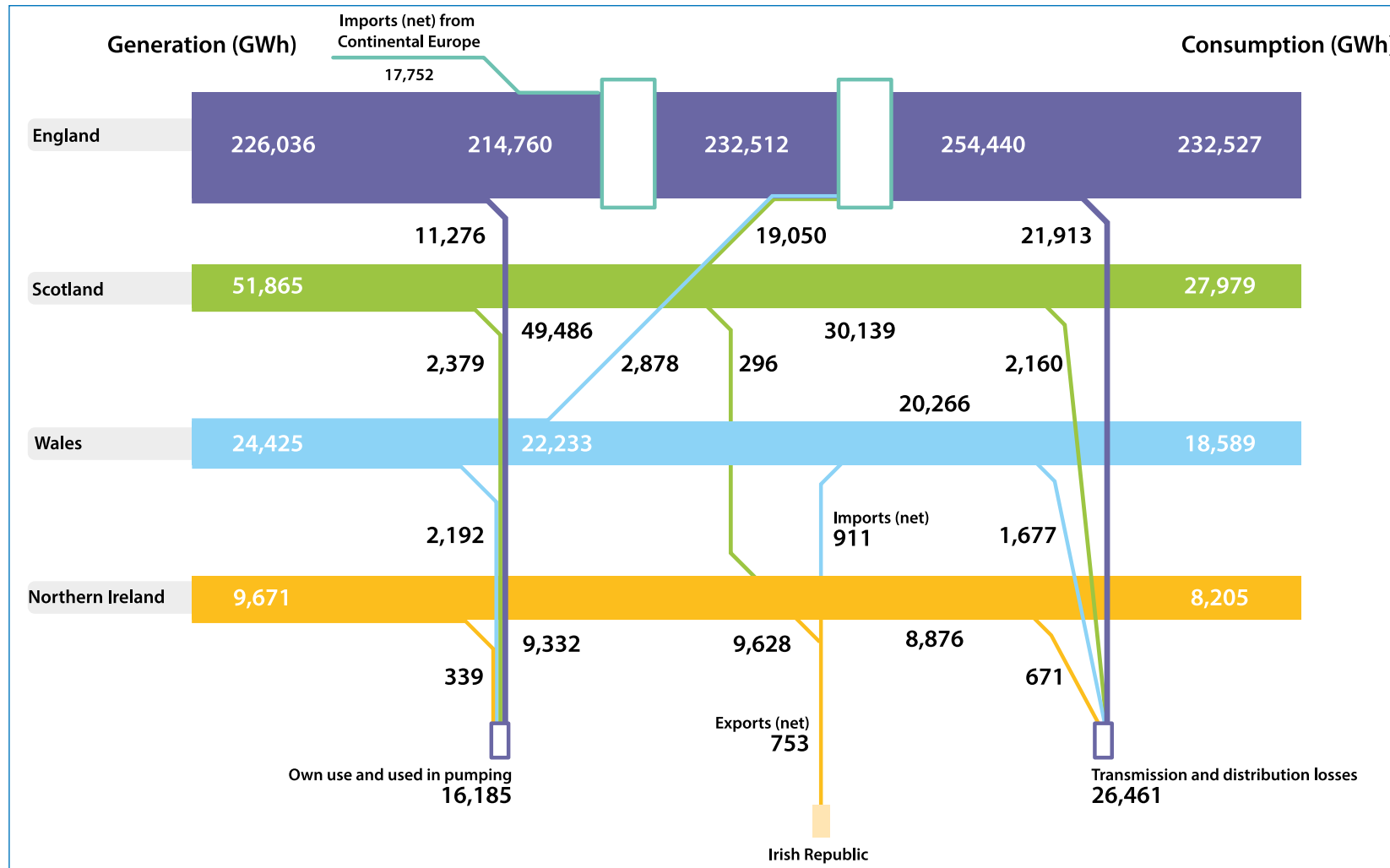
97 In general, losses are estimated from the discrepancy between power produced (as reported by power plants) and power sold to the end customers; the difference between what is produced and what is consumed constitute transmission and distribution losses. In this case, estimates of losses for each country 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.

98 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.

99 This derived figure for consumption for Northern Ireland for 2020 (i.e. 7,051 GWh) differs from that presented earlier (i.e. 7,416 GWh in Chart 3.2). More information on such differences is given in Annex 3.3.



Chart 3.4 Electricity Generation and Consumption Flow Chart, 2020



Source: BEIS [Regional Electricity Generation and Supply 2016-2020](https://www.gov.uk/government/statistics/regional-electricity-generation-and-supply-2016-2020), Gov.uk website.



Autogeneration

As noted above, 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. Data from BEIS contains details of autogeneration for Northern Ireland since 2004 as shown in the table below.

Table 3.3 Consumption by autogenerators and Transmission and Distribution losses for Northern Ireland, 2004 to 2020

	Consumption by autogenerators (GWh)	Transmission and Distribution (T&D) losses (GWh)	Total electricity consumed (GWh) ¹⁰⁰	Autogeneration as a % of total electricity consumed	T&D losses as a % of total electricity consumed
2004	108	610	7,727	1%	8%
2005	92	627	8,265	1%	8%
2006	90	631	8,374	1%	8%
2007	94	681	8,543	1%	8%
2008	137	699	8,938	2%	8%
2009	78	728	8,644	1%	8%
2010	248	722	8,670	3%	8%
2011	370	751	8,516	4%	9%
2012	411	747	8,331	5%	9%
2013	591	699	8,225	7%	9%
2014	668	727	7,972	8%	9%
2015	858	690	8,207	10%	8%
2016	924	655	8,243	11%	8%
2017	1,291	674	8,297	16%	8%
2018	1,566	710	8,538	18%	8%
2019	1,484	676	8,457	18%	8%
2020	1,583	671	8,205	19%	8%

Source: BEIS ([Energy Trends December 2021 special feature articles, Gov.uk website.](#))

Table 3.3 above shows that consumption by autogenerators in Northern Ireland between 2004 and 2009 was only about 1% of electricity consumed. It increased year-on-year up to 2018 when it accounted for around one-fifth of electricity consumed. This proportion has stayed steady with similar proportions for 2019 and 2020 and an average of around 1,500 GWh of autogeneration for Northern Ireland in each year 2018-2020. By comparison, autogeneration as a percentage of total electricity consumed in 2020 for the UK as a whole was 9% (8% for England, 16% for Scotland, 11% for Wales).

There is no information on how much of this autogeneration is renewable or otherwise but as the table shows, autogeneration volumes for Northern Ireland are significant. Indeed, since 2015, autogeneration volumes in Northern Ireland have been higher than transmission and distribution losses. These losses are equivalent to around 8-9% of total electricity consumption in Northern Ireland each year.

100 This includes consumption by autogenerators.



Imports, Exports and Transfers of Electricity in Northern Ireland

As noted earlier, Northern Ireland has connection to the Irish and Scottish electricity networks (via the North-South tie-lines and Moyle Interconnector respectively). Table 3.4 below highlights the volume of electricity that has passed between these countries in recent years.

Table 3.4 Annual Imports, Exports and Transfers of Electricity (GWh), 2002 to 2021

Year	Imports		Net imports (Ireland to NI)	Transfers		Net transfers (Scotland to NI)	Total net imports/ transfers
	Ireland → NI	NI → Ireland		Scotland → NI	NI → Scotland		
2002	140	148	-8	816	0	816	808
2003	119	86	33	1,012	0	1,012	1,045
2004	0	1,574	-1,574	2,793	0	2,793	1,219
2005	1	2,074	-2,073	1,687	0	1,687	-386
2006	10	1,788	-1,778	941	36	905	-873
2007	53	1,382	-1,329	1,730	2	1,728	399
2008	152	373	-222	700	155	545	323
2009	85	452	-376	1,991	14	1,977	1,601
2010	145	379	-234	2,298	1	2,297	2,064
2011	121	366	-245	1,769	0	1,769	1,524
2012	173	333	-160	2,164	2	2,162	2,002
2013	157	202	-45	1,551	11	1,541	1,495
2014	243	122	121	1,109	65	1,044	1,165
2015	490	155	334	685	494	191	526
2016	639	240	399	438	690	-252	147
2017	271	381	-110	747	892	-145	-255
2018	377	848	-471	1,315	609	707	236
2019	302	1,127	-825	1,475	495	981	156
2020	321	1,074	-753	1,063	767	296	-456
2021 ¹⁰¹	325	1,417	-1,092	1,637	772	865	-227

Source: BEIS ([Energy Trends, Gov.uk website.](#))

Table 3.4 shows that, with the exception of 2003, Northern Ireland exported more electricity to Ireland than it received in imports from Ireland 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 Ireland (an average of over 1,700 GWh per year). Indeed, exports to Ireland in 2005 and 2006 were larger than the transfers from Scotland in the same years (which means that, overall, Northern Ireland was a net exporter of electricity in those years). For the next 10 years (2008 to 2017) exports to Ireland were low at an average of 300 GWh per year. Exports have since grown considerably since with an average of around 1,000 GWh per year in the period 2018 to 2020 and over 1,400 GWh in 2021, the highest level since 2006.

In each year 2014 to 2016, Northern Ireland imported more electricity from the Republic of Ireland than it exported, although the imports and exports volumes accounted 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). However, the previous trend has returned with Northern Ireland exporting more electricity than imported in each year 2017 to 2021.

101 Data for 2021 is provisional and subject to revision. Latest updated data is available at [Energy Trends UK electricity, Gov.uk website.](#) (see Table ET5.6).

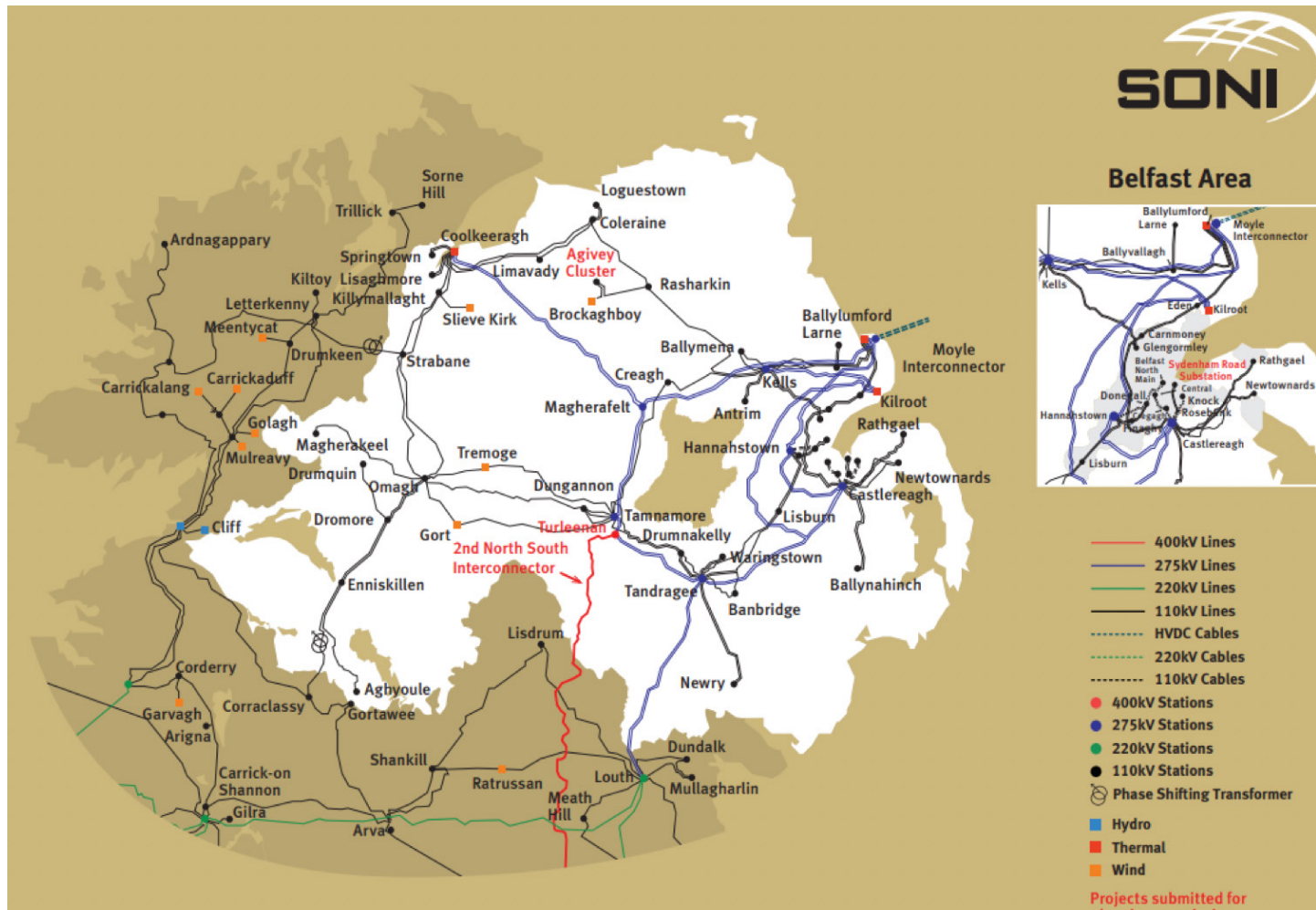


Net transfers of electricity from Scotland via the Moyle Interconnector were significant in the years 2009 to 2013 when such transfers averaged around 2,000 GWh (equivalent to around one quarter of all electricity consumed in Northern Ireland over that period). Transfers of electricity from NI to Scotland were very small during these years. After dropping to around 1,000 GWh in 2014, this then fell to less than 200 GWh in 2015. In 2016 and 2017, electricity transfers to Scotland from NI were more than the volume imported (although the overall difference, around 200 GWh, was small with fairly similar volumes transferred in each direction).

However, in each year 2018 to 2021 Northern Ireland again received more electricity transfers from Scotland than electricity sent to Scotland. Indeed, transfers from Scotland in 2021 (at over 1,600 GWh) were at their highest level since 2012. In 2021, Northern Ireland exported over 1,400 GWh to Ireland (and Ireland also has interconnection with Wales) so there are often significant electricity imports/exports/transfers between these countries to help balance their electricity requirements.



Annex 3.1 Map of the Transmission System Network for Northern Ireland



Source: SONI ([SONI Transmission Map on SONI website](#))



Annex 3.2 Generation and Supply

As noted earlier Northern Ireland has three main electricity-generating plants, a number of renewable generators and interconnection with grids in 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 2020.

Table 3.5 Generation and Supply of Electricity in the UK, England, Scotland, Wales and Northern Ireland (GWh), 2020

		England	Scotland	Wales	Northern Ireland	UK
(A)	Electricity Generated by Major power producers (MPPs)	186,578	42,330	20,070	6,330	255,308
(B)	Minus Electricity Used in pumping at pumped storage and other own use by MPPs	7,287	1,782	1,760	132	10,961
(C)	Equals Electricity supplied (net) by MPPs	179,291	40,548	18,310	6,199	244,348
(D)	Electricity Generated by Other generators	39,458	9,535	4,356	3,341	56,689
(E)	Minus Own use by other generators	3,989	597	432	207	5,225
(F)	Minus Consumption by autogenerators	17,925	4,517	1,983	1,583	26,007
(G)	Equals Electricity supplied (net) by Other generators	17,545	4,421	1,941	1,550	25,457
(H)	Total electricity generated = (A) + (D)	226,036	51,865	24,425	9,671	311,997
(J)	Total electricity supplied (net) by indigenous generators = (C) + (G)	196,835	44,969	20,251	7,749	269,804
(K)	Electricity transferred to England (imports minus exports)	21,928	-19,050	-2,878	0	0
(L)	Electricity transferred to Northern Ireland (imports minus exports)	0	-296	0	296	0
(M)	Electricity transferred to Europe (imports minus exports)	17,752	0	911	-753	17,910
(N)	Total transfers = (K) + (L) + (M)	39,680	-19,347	-1,967	-456	17,910
(P)	Total electricity supplied (indigenous generation plus imports minus exports) = (J) + (N)	236,516	25,623	18,284	7,292	287,714
(Q)	Minus Transmission losses	-6,871	-665	-513	-180	-8,229
(R)	Minus Distribution losses and theft	-15,043	-1,495	-1,164	-491	-18,192
(S)	Equals Consumption from public supply	214,602	23,462	16,607	6,621	261,293
(T)	Electricity sales (public supply)	216,128	21,479	16,725	7,051	261,383

Source: BEIS ([Energy trends December 2021 special feature articles, Gov.uk website.](#))



The previous table shows figures on total generation, consumption, transfers and losses for the four regions of the UK and the UK total for 2020. 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 Scotland & Wales and from continental Europe (via the France and Netherlands interconnectors) to meet its electricity demands. Of particular note, in 2020 Scotland exported over two fifths (42%) of its net electricity supplied by indigenous generators to England (i.e. transfers of 19,050 GWh to England out of 44,969 GWh net electricity supplied by indigenous generators in Scotland).

Wales started trading with 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 Ireland. However, since 2016, this has reversed with Wales importing more electricity from Ireland than it supplied in each year.

Northern Ireland was a net exporter in terms of electricity trades with Ireland (via the North-South tie-lines) in 2020, the net amount being 753 GWh or equivalent to about 10% of Northern Ireland's net electricity supplied by indigenous generators. What is notable about the BEIS data (as shown in Table 3.5 above and Table 3.4 earlier) is that in 2020 Northern Ireland generated more electricity than it required to meet indigenous consumption. Indeed, since 2016, Northern Ireland was able to meet all (or the overwhelming majority of) its own electricity demands without relying on imports or transfers of electricity from other countries.

Table 3.4 earlier showed that, for the first time, Northern Ireland was a net exporter of electricity to Scotland (via the Moyle interconnector) in 2016 and again in 2017, though the net amounts were small. However, Northern Ireland returned to being a net importer of electricity from Scotland in 2018 and this has continued for 2019 and 2020. In previous years 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).



Annex 3.3 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 shown in the table below. BEIS publish two consumption estimates in their tables: one is a 'calculated' consumption figure (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 from public supply) and the second figure is electricity sales from public supply.

The following table shows the consumption figures published by DfE (as provided by data from NIE Networks) against the two BEIS consumption estimates for the period 2010 to 2020.

Table 3.6 Electricity Consumption in Northern Ireland by Publication Source, 2010 to 2020

Year	DfE consumption data	BEIS data		Difference (DfE Compared to BEIS)		% Difference (DfE Compared to BEIS)	
		Consumption from public supply	Electricity sales (public supply)	Consumption from public supply	Electricity sales (public supply)	Consumption from public supply	Electricity sales (public supply)
2010	8,432	8,422	8,532	11	-100	0%	-1%
2011	8,235	8,146	8,209	89	26	1%	0%
2012	8,095	7,920	7,961	175	134	2%	2%
2013	8,181	7,633	7,791	547	390	7%	5%
2014	8,022	7,304	7,438	718	585	9%	7%
2015	7,819	7,348	7,446	471	373	6%	5%
2016	7,794	7,319	7,312	475	482	6%	6%
2017	7,806	7,006	7,389	800	417	10%	5%
2018	7,890	6,972	8,000	918	-110	12%	-1%
2019	7,713	6,973	7,435	740	278	10%	4%
2020	7,416	6,621	7,051	795	365	11%	5%

Source: BEIS ([Energy trends December 2021 special feature articles, Gov.uk website](#)) and DfE ([Northern Ireland Renewable Electricity data tables, DfE website](#))

In the period 2010-2012, differences were small (at 2% or less). Between 2013 and 2016, the differences in electricity consumption figures between the two sources was higher at around 5-7% (DfE data against BEIS sales) and 6-9% for DfE data against BEIS calculated consumption from public supply. From 2017-2020, the difference between DfE data and BEIS calculated consumption from public supply grew again (to between 10-12%) whilst the difference between DfE data and BEIS sales data remained at 5% or less.

The DfE figures presented earlier (in Chart 3.2 and also shown in the table above) are those used in DfE's Electricity Consumption and Renewable Generation in Northern Ireland publication to measure progress against targets and are based on consumption from actual and estimated aggregated meter readings rather than a 'calculated' consumption figure. The BEIS electricity sales data is generally within 5% or less of the data provided by NIE Networks to DfE and any differences may be due to different time periods (calendar year versus financial year) or different coverage (inclusion or exclusion of certain tariffs).

Chapter 4:
Renewable Electricity



Chapter 4: Renewable Electricity

Summary of Key Points

- Northern Ireland has had a number of renewable electricity targets in recent years. DfE’s new Energy Strategy, published in December 2021, includes a target to “Meet at least 70% of electricity consumption from a diverse mix of renewable sources by 2030”.
- The annual proportion of electricity consumption from renewable sources in Northern Ireland has risen considerably in recent years, from 9.7% in 2009 to 41.3% in 2021.
- Wind remains the dominant source of renewable electricity generation in Northern Ireland accounting for 82.1% of total renewable generation volumes in 2021. 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.
- Whilst there was a fall in renewable generation between 2020 and 2021 (wind generation fell due to lower wind speeds in 2021), in recent years there have been often large increases in the volume of renewable electricity generated in Northern Ireland and in the number of sites and installed capacity at sites generating electricity from renewable sources. The volume of renewable electricity generated in 2021 (3,131 GWh) was three times the volume generated in 2011 (1,033 GWh).
- Around two thirds of renewable electricity capacity and generation was accounted for by three of the eleven Northern Ireland district council areas namely: Causeway Coast & Glens; Derry City & Strabane; and Fermanagh & Omagh.
- In terms of the fuel type used for electricity generation, in Northern Ireland in 2020 renewables (45.6%) accounted for a higher share than gas (42.5%). Northern Ireland’s proportion of electricity generated from gas was similar to England (39.1%), significantly lower than Wales (55.7%) but significantly higher than in Scotland (10.4%).
- In terms of the percentage of total indigenous electricity generation accounted for by indigenous renewable generation, Northern Ireland had the second highest proportion (45.6%) of all four UK regions in 2020 using this measure, higher than England (39.5%) and Wales (36.1%). Scotland had the highest proportion (61.8%) with the UK average at 43.1%.



Introduction

There are a number of renewable electricity generators in Northern Ireland and this chapter describes the available data on such electricity generation.

Definition

Renewable energy is energy derived from natural processes (e.g. sunlight and wind) that are replenished at a rate that is equal to or faster than the rate at which they are consumed¹⁰². 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 Renewable Electricity Targets

Northern Ireland has had a number of renewable electricity targets in recent years. 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"¹⁰³. Separately, the Executive's Strategic Energy Framework (SEF) included a target to achieve 40% of electricity consumption from renewable sources by 2020¹⁰⁴. More recently, DfE's new Energy Strategy, published in December 2021, includes a target to "Meet at least 70% of electricity consumption from a diverse mix of renewable sources by 2030".

DfE's quarterly 'Electricity Consumption and Renewable Generation in Northern Ireland' publication aids reporting on performance against such government targets¹⁰⁵. In this publication, 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)¹⁰⁶.

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 targets (the 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. The new Energy Strategy for Northern Ireland, "Path to Net Zero Energy", commits to reviewing both the level and the calculation methodologies for the renewable electricity target in 2025.

102 Taken from [About Renewable Energy, Government of Canada website](#).

103 See [Programme for Government 2011 - 2015, Northern Ireland Executive website](#) for more information on the 2011-2015 Programme for Government.

104 See [A Strategic Energy Framework for Northern Ireland, DfE website](#).

105 More information on this publication is available in [Electricity Consumption and Renewable Generation Statistics, DfE website](#).

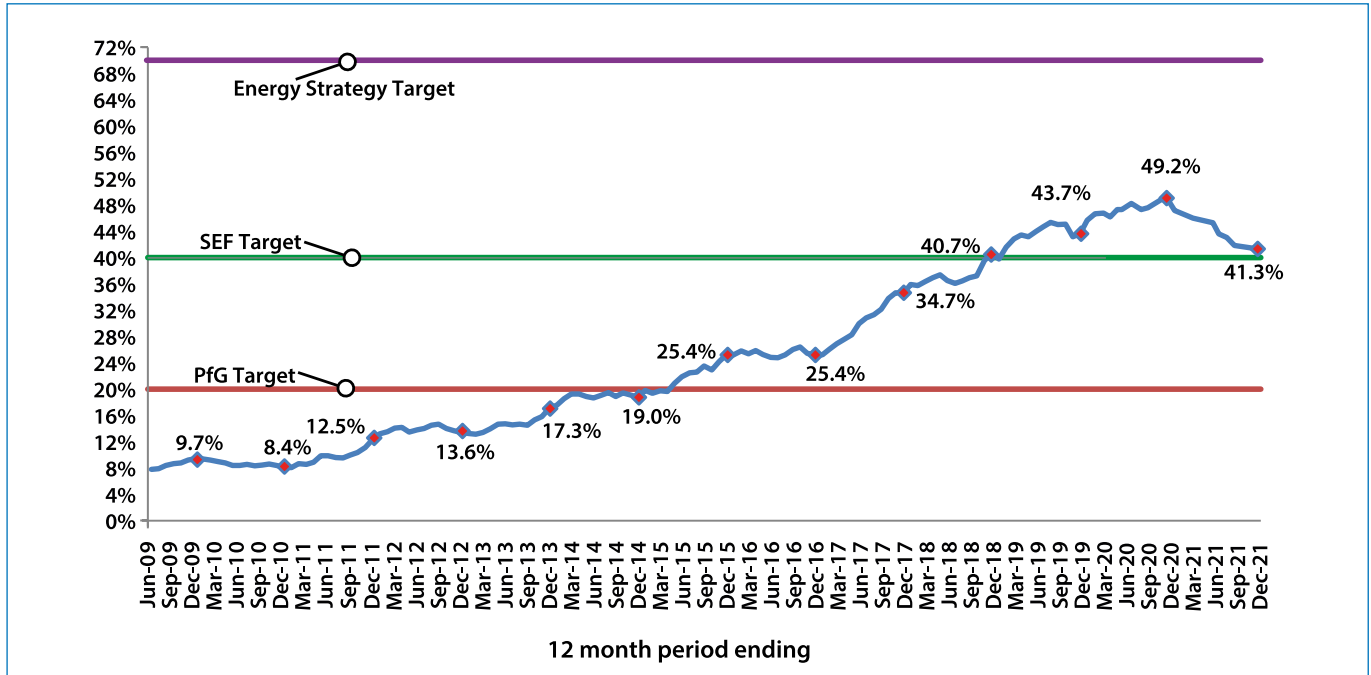
106 Electricity produced by those who generate their own electricity (mainly for their own use but some of which may 'spill' onto the distribution network) is excluded as information about such 'microgeneration' or consumption is not readily available to NIE Networks. Also, some imported electricity 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 January 2021 to December 2021, 41.3% of total electricity consumption in Northern Ireland was generated from renewable sources. This represents a decrease of 7.9 percentage points on the previous 12 month period (January 2020 to December 2020).

Chart 4.1 Rolling 12-Month Average Percentage of Electricity Consumption from Renewable Sources, June 2009 to December 2021



Source: DfE ([Northern Ireland Renewable Electricity Data Tables, Department for the Economy website](#))

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 41.3% of total electricity consumption in Northern Ireland being generated from renewable sources for the 12 month period ending December 2021. This represents a more than five-fold 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, the SEF target was first exceeded for the 12 month period ending December 2018 and the proportion reached a peak of 49.4% for the 12 month period ending November 2021.

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 9.3 percentage point rise to 34.7% in 2017. There was another large rise of 6 percentage points between 2017 and 2018 (from 34.7% to 40.7%), a rise of 3 percentage points between 2018 and 2019 (40.7% to 43.7%) followed by another large rise from 2019 to 2020 (up 5.5 percentage points to 49.2%). Such large rises are usually attributable to new renewable generation facilities coming on line and/or increased wind levels during the year. In addition, initiatives such as the DS3 programme¹⁰⁷ will have facilitated the achievement of such rises.

107 See [DS3 Programme, System Operator for Northern Ireland website](#).



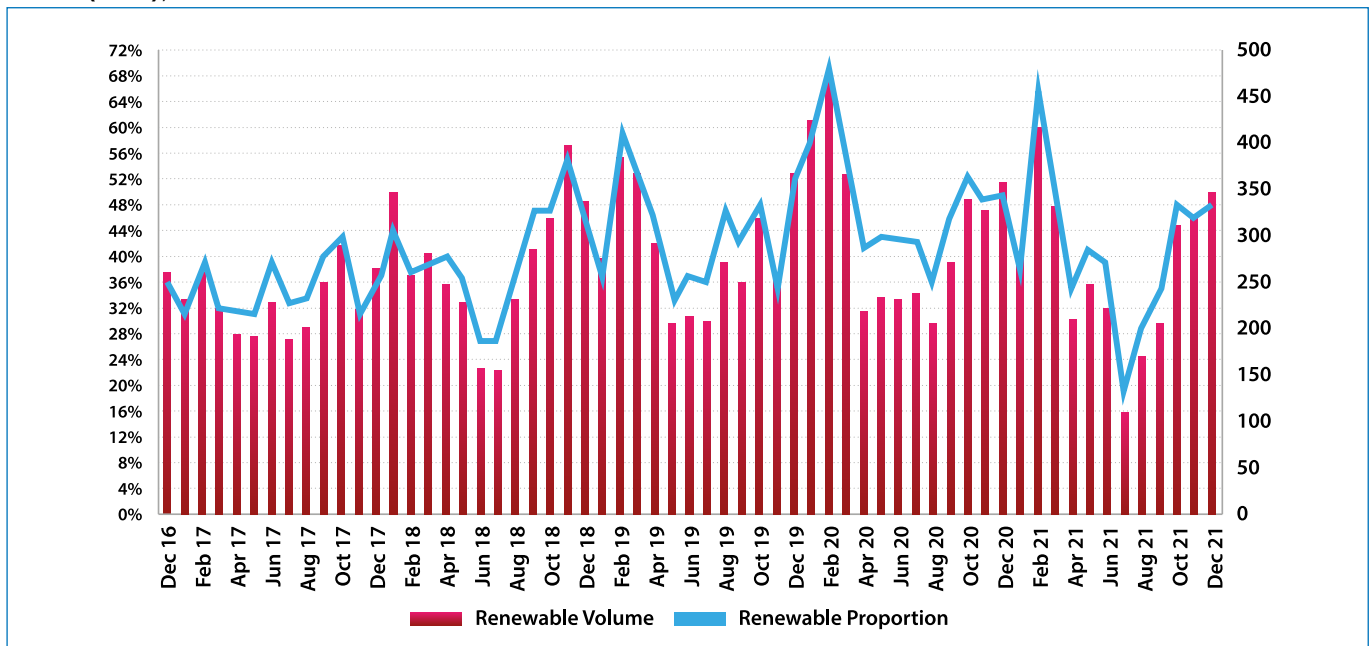
The decrease between 2020 and 2021 (from 49.2% to 41.3%) in the proportion of electricity consumption generated from renewable sources was driven by the reduced volume of wind generation due to lower wind speeds experienced during 2021¹⁰⁸.

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 February 2020 (69.3%) and February 2021 (65.4%), generation from renewable sources located in Northern Ireland accounted for some two thirds or more of all electricity consumed in Northern Ireland in those months. However, this compares to less than 19% in July 2021. Such variation is due to large fluctuations in renewable electricity generation each month, caused mainly by changing weather conditions and also increases due to 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 by month (GWh), December 2016 to December 2021



Source: DfE ([Northern Ireland Renewable Electricity Data Tables, Department for the Economy website](#))

Chart 4.2 also highlights the close relationship between renewable volumes and the overall renewable proportion. The renewable proportion for measuring against the 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)¹⁰⁹. 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.

108 See [Energy Trends: UK weather, Gov.uk website](#). Average wind speeds in 2021 were 14% lower than in 2020 and 12% lower than the 10-year mean.

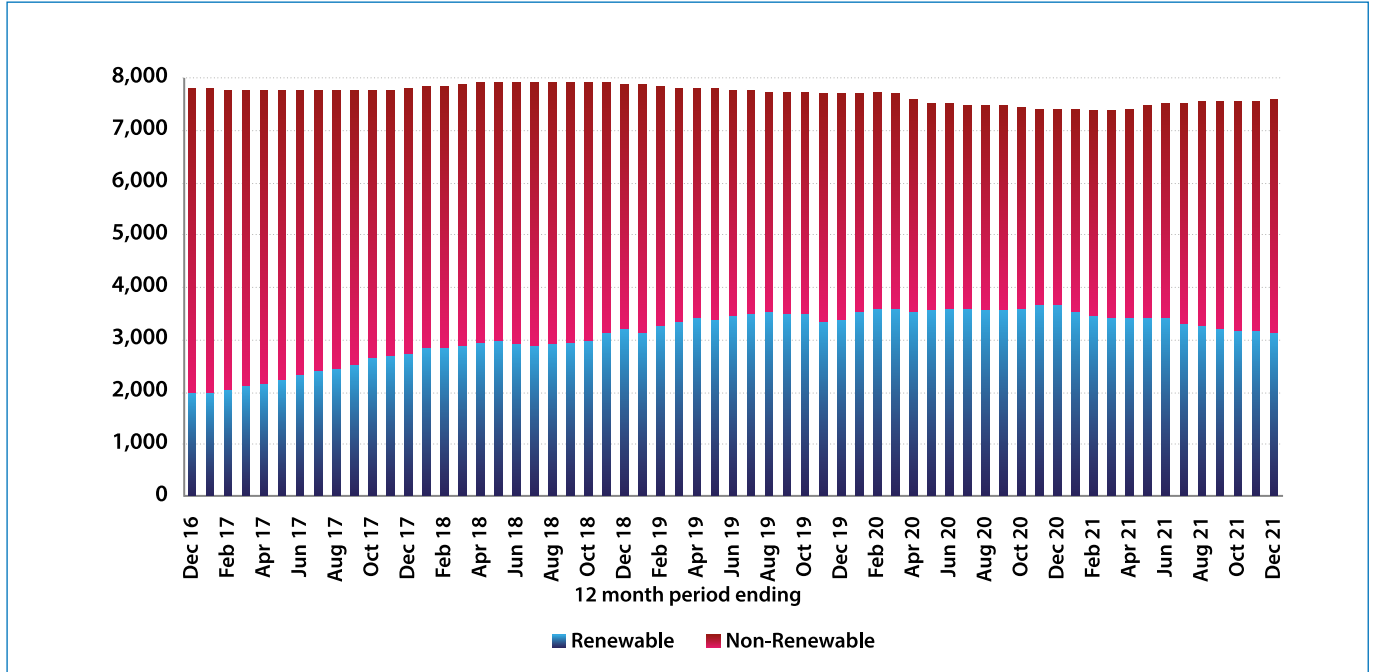
109 Annex 4.1 shows the monthly renewable proportion mapped against monthly total consumption.



Volume – Rolling 12-Month Period

Renewable generation volumes were some 1,981 GWh for the 12 month period ending December 2016 but have increased by around 60% to 3,131 GWh for the 12 month period ending December 2021. Total electricity consumption was fairly constant up to February 2020 with the impact of Covid-19 lockdowns then resulting in lower rolling 12 month consumption volumes for around one year from March 2020.

Chart 4.3 Rolling 12-Month Volume of Electricity Consumed by Source¹¹⁰ (GWh), December 2016 to December 2021



Source: DfE ([Northern Ireland Renewable Electricity Data Tables, Department for the Economy website](#))

As Chart 4.3 shows, for the 12 month period January 2021 to December 2021, approximately 7,574 Gigawatt hours (GWh) of total electricity was consumed in Northern Ireland. Of this, some 3,131 GWh was generated from renewable sources within Northern Ireland. The highest renewable generation volume was for the 12 month period ending November 2020 at 3,660 GWh, so the total for the 12 month period ending December 2021 was 14.5% below this peak. As noted earlier, lower wind speeds in 2021 have resulted in a reduction in renewable volumes generated.

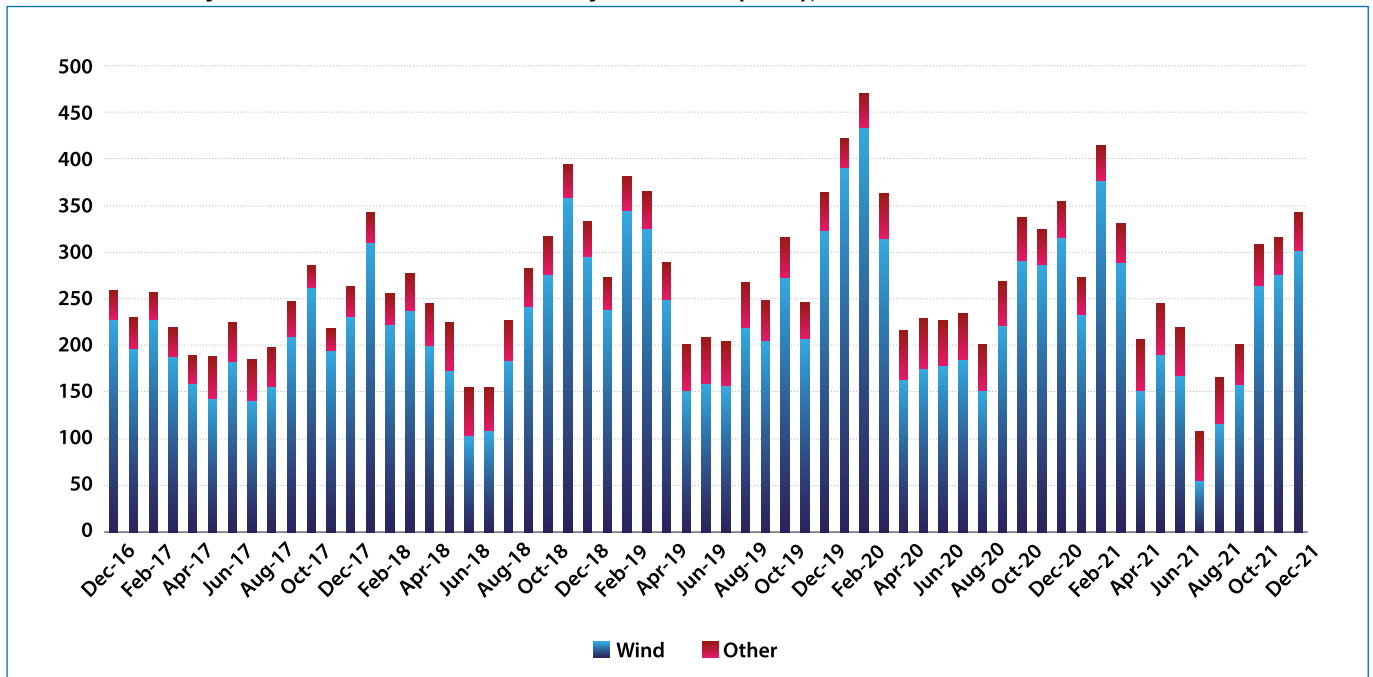
110 Non-renewable volumes are calculated by subtracting indigenous renewable generation from total consumption and is therefore an approximation. It should be noted that all imported electricity is categorised as non-renewable even though some may actually have come from renewable sources. However, information 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 volume of renewable electricity coming from other sources has increased (mainly due to rises in solar PV and biogas).

Chart 4.4 Monthly Volume of Renewable Electricity Generated (GWh), December 2016 to December 2021



Source: DfE ([Northern Ireland Renewable Electricity Data Tables, Department for the Economy website](#))

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 fewer large monthly fluctuations. Volumes from these other sources¹¹¹, whilst relatively small in overall terms, have grown over the period shown: monthly volumes averaged around 35.5 GWh in 2017 compared to 46.7 GWh in 2021, a rise of around 32%. This compares to a rise of about 13% in average wind renewable volumes over the same period.

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. 50% of renewable generation for July 2021 and 25% or more of renewable monthly electricity generated on six other occasions since December 2016).

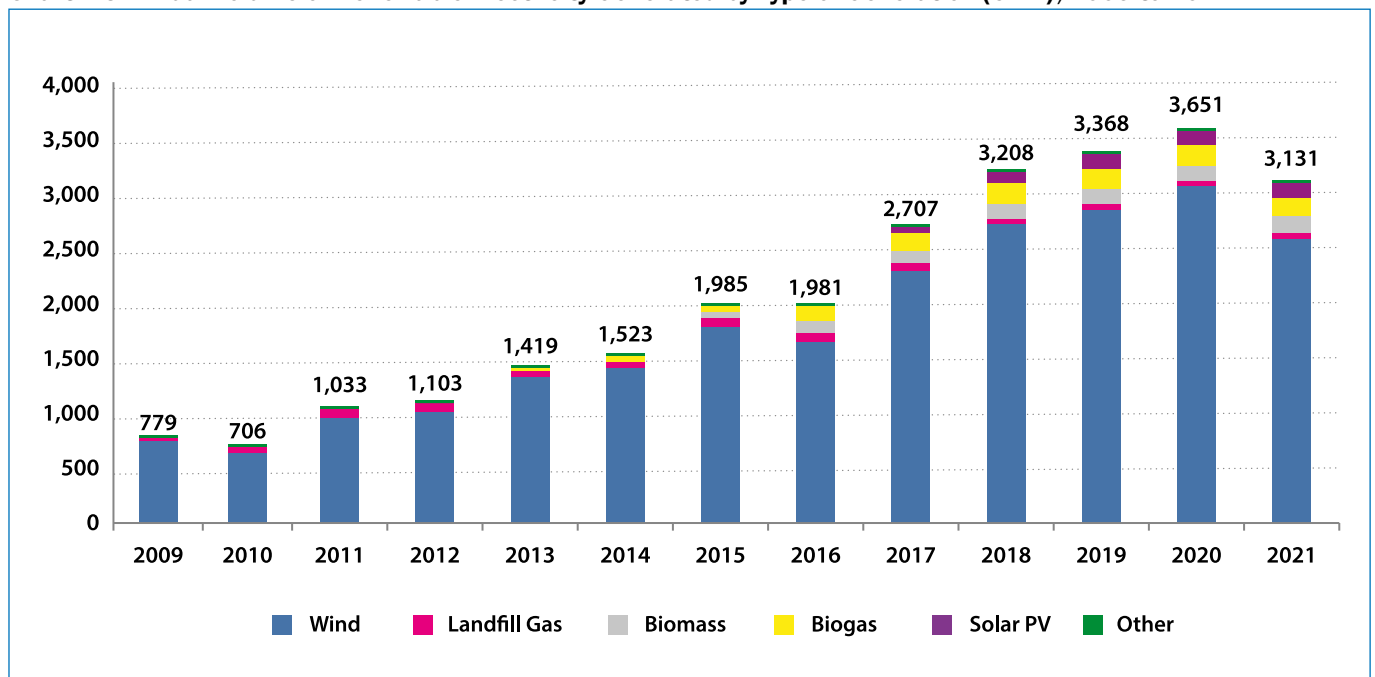
111 Other sources include landfill gas, biogas, biomass, hydro, Combined Heat and Power (CHP), tidal and solar.



Volume – Calendar Year

The chart below shows the total volume of renewable electricity generated in Northern Ireland for each calendar year 2009 to 2021, split by type of renewable generation. Total renewable generation volumes have increased substantially in recent years; they were over three times higher in 2021 compared to 2011 (from around 1,033 GWh in 2011 to some 3,131 GWh in 2021). Again, wind is the largest contributor (accounting for 82.1% of total renewable generation in 2021), but there have been increases of renewable electricity volumes of all types except landfill gas over the period 2011-2021. The fall in annual renewable generation between 2020 and 2021 was due to the fall in wind generation due to lower wind speeds in 2021.

Chart 4.5 Annual Volume of Renewable Electricity Generated by Type of Generation (GWh), 2009 to 2021



Source: DfE ([Northern Ireland Renewable Electricity Data Tables, Department for the Economy website](#))

Renewable generation from landfill gas sources was some 22 GWh in 2009 but was higher and remained stable between 2010 and 2014, contributing some 60 GWh annually to renewable generation volumes for Northern Ireland; this increased to over 80 GWh in 2016 and 2017 but fell back to about 60 GWh in 2019 and 50 GWh in 2020 and 2021. Whilst landfill gas represented over 8% of total renewable generation in 2010, this has fallen to less than 2% of total renewable generation each year since 2019 due to significant increases in other renewable sources.

Generation from Biogas and Biomass grew significantly in recent years. In 2011, there was less than 1 GWh in generation from these two sources but by 2021 there was a combined total of 370.1 GWh (158.2 GWh from Biogas and 211.9 GWh from Biomass and both highest annual volumes on record) and together they represented 11.8% of total renewable generation volumes for Northern Ireland in 2021. In addition, generation volumes from Solar PV increased markedly in recent years. There was virtually no generation from Solar PV up to 2016 (less than 2 GWh in every year 2009-2016). However, this jumped to almost 67 GWh of generation in 2017 and rose to over 113 GWh in 2018, 118 GWh in 2019 and rose again to about 126 GWh for 2020 before a small fall (to 123 GWh) in 2021. Solar PV accounted for 3.9% of total renewable generation volumes for Northern Ireland in 2021, equivalent to around 80% of the contribution from Biomass and two and a half times the volume provided by Landfill Gas sources.



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 level¹¹². Some key tables are presented here.

Table 4.1 Number of Sites Generating Electricity from Renewable Sources, 2020

	Wind	Hydro	Wave & Tidal	Landfill Gas	Sewage Gas	Other Bio energy	Total exc PV	Solar PV	Total
England	4,042	366	1	364	168	795	5,736	743,070	748,806
East Midlands	427	29	-	39	15	111	621	87,552	88,173
East of England	880	7	-	71	15	96	1,069	105,331	106,400
North East	276	17	-	20	7	35	355	47,458	47,813
North West	522	80	-	49	24	91	766	85,037	85,803
London	31	-	-	5	10	20	66	25,810	25,876
South East	111	25	-	71	35	62	304	114,237	114,541
South West	818	130	-	38	18	132	1,136	122,611	123,747
West Midlands	175	23	-	29	19	142	388	71,506	71,894
Yorkshire and the Humber	802	55	1	42	25	106	1,031	83,528	84,559
Wales	717	323	1	26	16	81	1,164	55,776	56,940
Scotland	3,530	763	17	49	8	137	4,504	61,454	65,958
Northern Ireland	1,327	82	-	15	2	166	1,592	24,456	26,048
<i>Other Sites</i>	236	27	-	-	-	6	269	150,307	150,576
UK Total	9,852	1,561	19	454	194	1,185	13,265	1,035,063	1,048,328

Source: BEIS ([Regional Renewable Statistics, Gov.uk website](#))

Table 4.1 shows there were 1,592 non-PV¹¹³ sites in Northern Ireland generating electricity from renewable sources, with 5,736 non-PV sites in England, 4,504 in Scotland and 1,164 in Wales¹¹⁴. 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 94% for Northern Ireland) although the majority will be on domestic properties generating electricity for their own consumption. There were over one million solar PV sites generating electricity in the UK in 2020.

¹¹² Data for tables 4.1 to 4.5 are available in [Regional Renewable Statistics, Gov.uk website](#).

¹¹³ 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 (24,456) is based on data from the Microgeneration Certification Scheme and the Renewables Obligation.

¹¹⁴ There are a further 150,307 PV schemes and 269 non-PV schemes in other sites that, due to lack of appropriate geographical information, could not be assigned to one of the four countries.



There was huge growth in the number of sites generating electricity from renewable sources in Northern Ireland, particularly in solar PV installations between 2008 and 2018, as shown in Table 4.2 below. Solar PV, non-PV and total sites have, however, shown little change each year from 2018 to 2020.

Table 4.2 Number of Sites Generating Electricity from Renewable sources in Northern Ireland, selected years 2008 to 2020

Year	2008	2010	2012	2014	2016	2018	2019	2020
Non-PV	110	463	577	817	1,098	1,521	1,566	1,592
Solar PV	7	309	1,449	11,878	18,435	24,100	23,869	24,456
Total	117	772	2,026	12,695	19,533	25,621	25,435	26,048

Source: BEIS ([Regional Renewable Statistics, Gov.uk website](#))

Renewable Installed Capacity – UK and UK Regions

Table 4.3 shows there was over 1,860 megawatts¹¹⁵ (MW) of installed capacity at sites generating electricity from renewable sources in 2020 in Northern Ireland, which was 3.9% of total UK renewable capacity. England accounted for 63.0% of total UK installed capacity, Scotland 24.7% and Wales 7.5%¹¹⁶.

Table 4.3 Installed Capacity of Sites Generating Electricity from Renewable Sources (MW), 2020

	Wind	Hydro	Wave & Tidal	Landfill Gas	Sewage Gas	Other Bioenergy	Solar PV	Total
England	11,843.5	43.8	0.1	872.4	226.6	5,891.9	11,227.5	30,105.8
East Midlands	906.6	5.2	-	68.0	20.5	255.3	1,511.8	2,767.4
East of England	3,542.1	0.2	-	181.7	19.2	363.3	2,017.2	6,123.6
North East	583.8	8.2	-	45.0	11.5	666.8	233.6	1,548.9
North West	2,500.0	10.3	-	134.8	31.6	254.0	584.4	3,515.2
London	11.3	-	-	25.8	52.1	229.1	128.9	447.2
South East	1,596.3	1.7	-	166.7	36.1	403.5	2,100.3	4,304.6
South West	339.2	11.5	-	99.7	15.3	272.9	3,208.9	3,947.4
West Midlands	15.3	1.2	-	61.0	23.8	240.1	845.3	1,186.7
Yorkshire and the Humber	2,348.9	5.5	0.1	89.8	16.5	3,206.9	597.1	6,264.8
Wales	2,037.1	167.7	0.4	46.8	12.5	236.9	1,088.2	3,589.6
Scotland	9,245.9	1,653.3	21.9	115.9	7.2	394.3	353.9	11,792.4
Northern Ireland	1,354.3	11.0	-	19.5	0.2	140.6	334.9	1,860.5
Other Sites	4.1	-	-	-	-	3.1	457.9	465.2
UK Total	24,484.8	1,875.7	22.4	1,054.6	246.5	6,666.9	13,462.5	47,813.5

Source: BEIS ([Regional Renewable Statistics, Gov.uk website](#))

Wind accounted for half (51%) of total installed renewable capacity in the UK in 2020, however this varies considerably among the UK regions. For example, in the North East of England region (which had a similar total installed capacity to Northern Ireland in 2020) Wind accounted for 38% of installed capacity, around half the proportion of that for Northern Ireland (73%). Wind is also the predominant source of installed capacity in Scotland (78%) and Wales (57%) but in England it accounts from a much lower proportion (39%). In three English regions (London, South West and West Midlands), wind accounted for less than 10% of installed renewable capacity in 2020. Geographical features can be an important factor in terms of wind generation in each region. Wind generation can be very effective in coastal areas, at the tops of rounded hills, open plains and gaps in mountains - places where the wind is strong and reliable¹¹⁷.

115 Megawatts are used to measure the output of a power plant. One megawatt (MW) = 1,000 kilowatts = 1,000,000 watts.

116 About 1.0% of installed capacity is in other sites that could not be assigned to one of the four countries.

117 [Where wind power is harnessed, Energy Information Administration website.](#)



Most offshore wind activity is in England, and around half of onshore wind activity is in Scotland. The world's largest offshore windfarm, Hornsea 1, is based off the coast of Yorkshire¹¹⁸.

In England, Solar PV (37%) and Other Bioenergy (20%) together account for almost three-fifths of installed capacity, whereas these two renewable sources accounted for only 6% of installed capacity for Scotland, 26% for Northern Ireland and 37% in Wales in 2020.

The volume of renewable installed capacity has increased significantly in recent years in all regions of the UK. Table 4.4 overleaf shows renewable generation capacities for the four UK countries from 2008-2020 for Wind, Solar PV and Total installed capacities.

118 [Wind energy in the UK, Office for National Statistics website.](#)



Table 4.4 Installed Capacity of Sites Generating Electricity from Renewable Sources (MW), Wind, Solar PV and All sites, 2008 to 2020

	England			Wales			Scotland			Northern Ireland			UK		
	Wind	Solar PV	All	Wind	Solar PV	All	Wind	Solar PV	All	Wind	Solar PV	All	Wind	Solar PV	All
2008	1,091	1	2,616	375	0	602	1,745	0	3,350	214	0	228	3,446	23	6,837
2009	1,449	1	3,057	533	0	781	2,121	0	3,798	299	0	322	4,422	27	8,004
2010	1,867	65	3,702	538	3	794	2,676	2	4,369	341	1	368	5,421	95	9,256
2011	2,520	844	6,135	579	60	895	3,087	47	4,867	409	2	436	6,596	1,000	12,381
2012	3,970	1,469	8,250	644	109	1,007	3,954	91	5,811	460	6	500	9,030	1,753	15,649
2013	5,149	2,522	11,322	769	149	1,175	4,776	127	6,687	581	27	645	11,282	2,937	19,961
2014	5,895	4,770	14,766	1,182	374	1,824	5,264	167	7,309	696	62	807	13,074	5,528	24,920
2015	6,612	8,427	19,774	1,370	696	2,379	5,590	240	7,767	731	105	911	14,306	9,601	30,966
2016	7,184	10,352	22,696	1,567	962	2,866	6,487	292	8,798	886	134	1,115	16,126	11,914	35,651
2017	9,075	10,927	25,353	1,753	1,055	3,194	7,569	323	9,982	1,187	252	1,557	19,585	12,760	40,293
2018	9,931	11,085	27,787	1,858	1,073	3,349	8,472	347	10,952	1,340	322	1,801	21,606	13,059	44,129
2019	11,336	11,150	29,409	1,997	1,069	3,514	9,195	348	11,733	1,349	334	1,847	23,882	13,224	46,832
2020	11,833	11,228	30,106	1,995	1,088	3,590	9,195	354	11,792	1,349	335	1,860	24,377	13,462	47,813

Source: BEIS ([Regional Renewable Statistics, Gov.uk website](https://www.gov.uk/government/statistics/regional-renewable-statistics))

Northern Ireland had over eight times more renewable installed capacity in 2020 (1,860 MW) than in 2008 (228 MW). England had over eleven times more, Wales almost six times more and Scotland three and a half times more renewable installed capacity over this period. The growth in solar PV installed capacity has been particularly striking with each region showing large increases, though from a low base in all regions. The Northern Ireland Renewables Obligation (NIRO) scheme has obviously impacted here, particularly for microgenerators¹¹⁹ 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 zero in 2008 and 2009, to 1.2MW in 2010 (equivalent to 0.3% of all installed renewable capacity in Northern Ireland in 2010) to around 335MW in 2020 (equivalent to 18% of all installed renewable capacity in Northern Ireland in 2020). In 2020, Solar PV accounted for only 3% of installed renewable capacity in Scotland but over 30% in both England and Wales.

119 Under the Northern Ireland Renewables Obligation (NIRO) scheme, generating stations with a capacity of 50kW or less were termed as ‘Micro-NIRO’ stations.



Whilst increases in Solar PV capacity are significant, it is worth noting that Wind retains its role as the dominant source of installed renewable capacity for Northern Ireland. Wind still accounted for some 73% of installed renewable capacity in 2020, though this was down from about 94% between 2008 and 2011 due to the growth of other technologies such as Solar PV and Bioenergy. Wind accounted for 78% of installed renewable capacity in Scotland in 2020 but much lower amounts in both England (39%) and Wales (56%).

It is also worth noting that renewable installed capacities in the UK and each country increased markedly each year from 2008 to 2018 but growth rates slowed considerably each year thereafter. In general, there were year-on-year double-digit percentage increases for the UK and each country between 2008 and 2018, followed by average increases of 5% for 2018-2019 and less than 2% for 2019-2020.

Generation Volumes – UK and UK Regions

Table 4.5 below shows the actual volume of electricity generated from renewable sources for the latest year available, 2020. This again highlights that the majority of renewable electricity generated in Northern Ireland is wind generated – some 3,264 GWh out of a total 4,407 GWh, or 74%. This proportion has been steady since 2016 but is lower compared to earlier years as other technologies have taken a larger share. For example, in 2013, almost 89% of renewable generation in Northern Ireland was Wind generated with Bioenergy accounting for 5% and Solar PV only 0.8%. Seven years later, in 2020, this had changed to Wind accounting for 74%, Bioenergy 17% and Solar PV around 7% of all renewable generation, meaning the generation mix has changed considerably in only a few years.

Table 4.5 Generation of Electricity from Renewable Sources (GWh), 2020

	Wind	Hydro	Wave & Tidal	Landfill Gas	Sewage Gas	Other Bioenergy	Solar PV	Total
England	43,044	155	-	2,911	984	30,753	11,137	88,984
East Midlands	2,995	21	-	220	107	1,237	1,468	6,048
East of England	13,139	1	-	581	85	2,092	1,980	17,877
North East	1,639	33	-	111	21	3,995	231	6,030
North West	9,348	36	-	378	135	1,143	566	11,606
London	21	-	-	154	237	818	127	1,357
South East	6,014	6	-	632	160	1,415	2,149	10,377
South West	881	33	-	310	61	1,001	3,208	5,495
West Midlands	39	4	-	240	101	942	822	2,149
Yorkshire and the Humber	8,968	20	-	285	76	18,110	584	28,044
Wales	5,980	375	-	117	48	1,233	1,038	8,791
Scotland	23,071	6,178	11	407	34	1,996	333	32,031
Northern Ireland	3,264	38	-	61	1	751	292	4,407
<i>Other Sites</i>	10	8	-	-	-	14	358	390
UK Total	75,369	6,754	11	3,496	1,067	34,748	13,158	134,603

Source: BEIS ([Regional Renewable Statistics, Gov.uk website](#))

Wind is also the prevalent renewable generation source in Scotland (72%) and Wales (68%) but accounted for less than half (48%) of all renewable electricity generated in England. England accounted for 66% of total UK renewable generation volumes in 2020 but 85% of UK Solar PV generation and 89% of UK bioenergy generation (with the majority of this generated in one English region - Yorkshire and the Humber). England now also generates considerable volumes from Solar PV with this source accounting for 13% of renewable electricity generated there in 2020.



The vast majority (91%) of UK Hydro renewable electricity is generated in Scotland. England accounted for a similar proportion (92%) of UK renewable electricity generated from Sewage Gas and also 83% of total UK Landfill Gas renewable electricity generation in 2020. Northern Ireland accounted for 3.3% of total renewable electricity generated in the UK in 2020 and 9.4% of all renewable electricity generated from Onshore Wind sources in the UK as a whole.

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. The latest year available is for 2020 and results have been aggregated into the current eleven areas as shown in Table 4.6 below¹²⁰.

Table 4.6 Renewable Electricity Generation, Capacity and Site Numbers by District Council Area, 2020

District Council	Number of sites	Capacity (MW)	Generation (GWh)
Antrim & Newtownabbey	85	80	156.8
Ards & North Down	42	16	34.5
Armagh City, Banbridge & Craigavon	148	46	145.2
Belfast	23	37	79.7
Causeway Coast & Glens	183	376	853.6
Derry City & Strabane	134	334	939.6
Fermanagh & Omagh	190	473	1,179.7
Mid & East Antrim	127	123	267.5
Mid Ulster	194	126	360.5
Newry, Mourne & Down	102	18	54.8
Lisburn & Castlereagh	75	103	165.7
Unallocated	24,745	129	-
Total	26,048	1,860	4,237.6
Unallocated as % of Total	95%	7%	0% ¹²¹

Source: BEIS ([Regional Renewable Statistics, Gov.uk website](#))

'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 95%) were unallocated. However, further analysis shows that the vast majority (24,331 or over 98%) of the 24,745 unallocated sites are solar PV sites and, as shown in Table 4.5 above, unallocated sites account for only 7% of capacity.

The table shows that some two thirds of renewable electricity capacity (64%) and generation (70%) was accounted for by three of the eleven 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 areas¹²².

120 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.

121 Whilst unallocated information in Table 4.6 is taken from BEIS published data, generation data from BEIS for Northern Ireland (as shown in Table 4.5) was 4,407 GWh for 2020 compared to around 4,238 GWh for 2020 in the district council breakdown published by BEIS, a difference of 169 GWh or 4% which could probably be considered to be unallocated data.

122 See [Interactive Wind Energy Map, Wind Energy Ireland website](#) for a map of wind farm locations in Northern Ireland.



In general, the majority of capacity and generation is located in rural areas with large urban areas like Belfast or Lisburn & Castlereagh together accounting for a very small proportion (around 6-7%) of renewable capacity and generation.

Electricity Generation by Fuel Type – UK Countries

Data is available, for each of the four UK countries, on shares of generation of electricity by fuel type. For Northern Ireland, in 2020, renewable electricity generation (45.6%) accounted for more than indigenous electricity generation generated from gas (42.5%) for the first time.

Table 4.7 Shares of Generation for UK and UK Countries by Fuel Type, 2015, 2019 and 2020

	UK	Scotland	Wales	Northern Ireland	England
2015					
Coal	22.4%	16.1%	21.5%	24.4%	23.8%
Gas	29.5%	3.7%	46.3%	49.1%	31.6%
Nuclear	20.8%	34.6%	10.2%	0.0%	20.2%
Renewables	24.6%	42.4%	13.7%	25.5%	22.5%
Oil and Other	2.8%	3.2%	8.3%	0.9%	1.9%
2019					
Coal	2.1%	0.0%	2.3%	9.8%	2.3%
Gas	40.7%	12.3%	62.9%	45.1%	43.8%
Nuclear	17.4%	24.7%	0.0%	0.0%	18.6%
Renewables	36.9%	61.0%	26.6%	44.0%	32.9%
Oil and Other	2.8%	2.0%	8.2%	1.1%	2.4%
2020					
Coal	1.8%	0.0%	0.0%	10.8%	2.0%
Gas	35.7%	10.4%	55.7%	42.5%	39.1%
Nuclear	16.1%	25.7%	0.0%	0.0%	16.3%
Renewables	43.1%	61.8%	36.1%	45.6%	39.5%
Oil and Other	3.3%	2.0%	8.2%	1.1%	3.1%

Source: BEIS ([Energy Trends: December 2021. Special feature article Electricity generation and supply figures for Scotland, Wales, Northern Ireland and England, 2016 to 2020. Gov.uk website](#))

Table 4.7 shows that the fuel used for electricity generation has changed dramatically in recent years for all countries shown. In particular, the share of generation from renewables has increased substantially in all regions in recent years (see also Table 4.8). In Northern Ireland, the proportion of electricity generation from renewables increased significantly, from 25.5% in 2015 to 45.6% in 2020. There was a similar sized increase in the proportion in England while the proportion in Wales was more than 2.5 times higher. In Scotland, almost 62% of all electricity generated there in 2020 was from renewable generation sources with a further 25.7% from Nuclear and only around 11% of electricity generated in Scotland in 2020 was from fossil fuel generation.

In 2015 coal was an important fuel used in electricity generation in all countries, accounting for about one quarter of electricity generated in both Northern Ireland (24.4%) and England (23.8%) and over one fifth of generation in Wales (21.5%). By 2020, this had fallen to 10.8% for Northern Ireland and 2% for England and only 1.8% for the UK as a whole. Coal's share of electricity generation in Scotland was 16.1% in 2015 but there has been no coal generation in Scotland since 2017 and Wales joined them in this regard in 2020.



As well as renewables taking an increasing share of electricity generation in recent years, gas generation has also helped to replace coal in the electricity generation mix (increasing from 29.5% of generation for the UK in 2015 to over 40% in 2019 but then dropping to around 36% in 2020).

Nuclear generation accounted for over one fifth of total electricity generation for the UK (and England) and over one third of total electricity generation for Scotland in 2015 but these proportions have dropped to around one sixth of total electricity generation for the UK (and England) and just over one quarter of total electricity generation for Scotland in 2020. In 2015, just over 10% of electricity generated in Wales was from Nuclear but there was no electricity generation from this source in Wales from 2016 to 2020.

Renewable Electricity Generation by Country – Comparable Basis

In the UK, the share of renewables in electricity generation or sales can be measured in different ways¹²³. Table 4.8 shows the ‘headline’ overall measure for 2008 to 2020, 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 below are calculated on the same basis and are therefore directly comparable.

Table 4.8 Comparable Renewables Percentages for the UK and UK Countries, 2008 to 2020

	UK	Scotland	Wales	Northern Ireland	England
2008	5.7%	18.2%	4.9%	6.3%	3.6%
2009	6.7%	20.8%	5.5%	10.2%	4.2%
2010	6.7%	19.0%	5.3%	10.0%	4.7%
2011	9.6%	27.3%	7.7%	13.8%	6.4%
2012	11.3%	29.1%	6.9%	16.0%	8.5%
2013	14.9%	32.0%	6.7%	19.5%	12.4%
2014	19.1%	38.1%	9.6%	21.6%	16.5%
2015	24.6%	42.4%	13.7%	25.5%	22.5%
2016	24.5%	42.6%	12.4%	25.4%	23.1%
2017	29.2%	51.8%	20.0%	34.0%	25.9%
2018	33.1%	54.8%	23.4%	42.0%	29.6%
2019	36.9%	61.0%	26.6%	44.0%	32.9%
2020	43.1%	61.8%	36.1%	45.6%	39.5%

Source: BEIS ([Energy Trends: December 2021. Special feature article Electricity generation and supply figures for Scotland, Wales, Northern Ireland and England, 2016 to 2020. Gov.uk website](#))

The table shows that Scotland had the highest renewable percentage of the four UK countries with more than three-fifths of electricity generation in 2019 (61.0%) and 2020 (61.8%) accounted for by renewable generation. Northern Ireland had the second highest proportion in each of the years shown (behind Scotland). Renewable electricity generation in Northern Ireland accounted for 45.6% of all electricity generation in Northern Ireland in 2020 using this headline measure. It should be noted that the share of electricity from renewable sources transferred from Scotland or Wales to England, or from Scotland to Northern Ireland (or vice versa), is not known.

123 Another measure is that used by the EU - the Renewable Energy Directive (RED) basis. See Chapter 6 of the Digest of UK Energy Statistics 2021, page 43 at [Digest of UK Energy Statistics \(DUKES\) 2021, Gov.uk website](#). The proportion of renewable electricity using the RED methodology was 38.7% for the UK in 2020, lower than the 43.1% referenced in Tables 4.7 and 4.8. This is due to the ‘normalised’ methodology in the RED, whereby wind generation is calculated using an average of the load factors.



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. The proportion of all electricity generated in Northern Ireland from renewable sources in 2020 was more than seven times higher than the proportion in 2008, with a similar increase in Wales. A higher increase was seen in England (an almost 11 times increase) while the renewables proportion for Scotland more than trebled between 2008 and 2020.

The renewable electricity percentages produced by BEIS in Table 4.8 above and the underpinning methodology do not match with the annual percentages published by DfE (using data 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 4.9 overleaf shows the number of planning applications received by the Department for Infrastructure for each year 2004/05 to 2020/21, 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 and were relatively high up to 2014/15, but by 2016/17 and up to the latest year available (2020/21) had fallen back to levels seen in 2004/05 (though there was a slight increase in applications received in 2019/20 and 2020/21). Almost two thirds (66%) of all planning applications received for renewable energy installations over the 17 year period shown were received in the five year period 2010/11 to 2014/15.

Of all planning applications received in relation to renewable energy over the period 2004/05 to 2020/21, almost 4 out of every 5 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 closure of the Northern Ireland Renewable Obligation (NIRO) scheme: it closed to new large scale onshore wind on 31 March 2016, to new small scale onshore wind on 30 June 2016 and to all other technologies on 31 March 2017, with exceptions to those projects that met the criteria for grace periods. These grace periods have now passed and the NIRO scheme is completely closed¹²⁴.

124 See [Northern Ireland Renewables Obligation, Department for the Economy website](#) for more information.



Table 4.9: Applications Received by Renewable Energy Type, 2004/05 to 2020/21

	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	2018/ 19	2019/ 20	2020 /21
Single wind turbine¹²⁵	47	87	136	172	226	159	629	674	614	547	421	245	35	30	50	74	87
Wind farm	21	13	18	19	15	16	17	12	6	21	13	14	1	6	4	6	2
Hydroelectricity	0	3	6	1	2	10	16	30	23	20	17	7	4	3	2	0	1
Solar panels¹²⁶	3	31	19	40	22	11	5	36	124	69	61	43	18	5	2	2	6
Biomass/Anaerobic digester	2	3	3	5	6	4	31	68	31	16	20	17	22	10	14	4	4
Other	0	0	0	5	3	3	6	0	3	5	4	3	1	4	6	2	0
Total	73	137	182	242	274	203	704	820	801	678	536	329	81	58	78	88	100

Source: Department for Infrastructure ([Planning activity statistics, Department for Infrastructure website](#))

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. As at end April 2022, data for 2020/21 was the most up-to-date renewable energy information available. Data for 2020/21 is provisional.
3. Other includes, Landfill Gases, Waste Incineration and Heat Pumps.

¹²⁵ Planning permission is required for all wind turbines. This includes turbines for domestic purposes, hospitals, factories, farms, schools etc. (see [Wind, nidirect website](#) for further details).

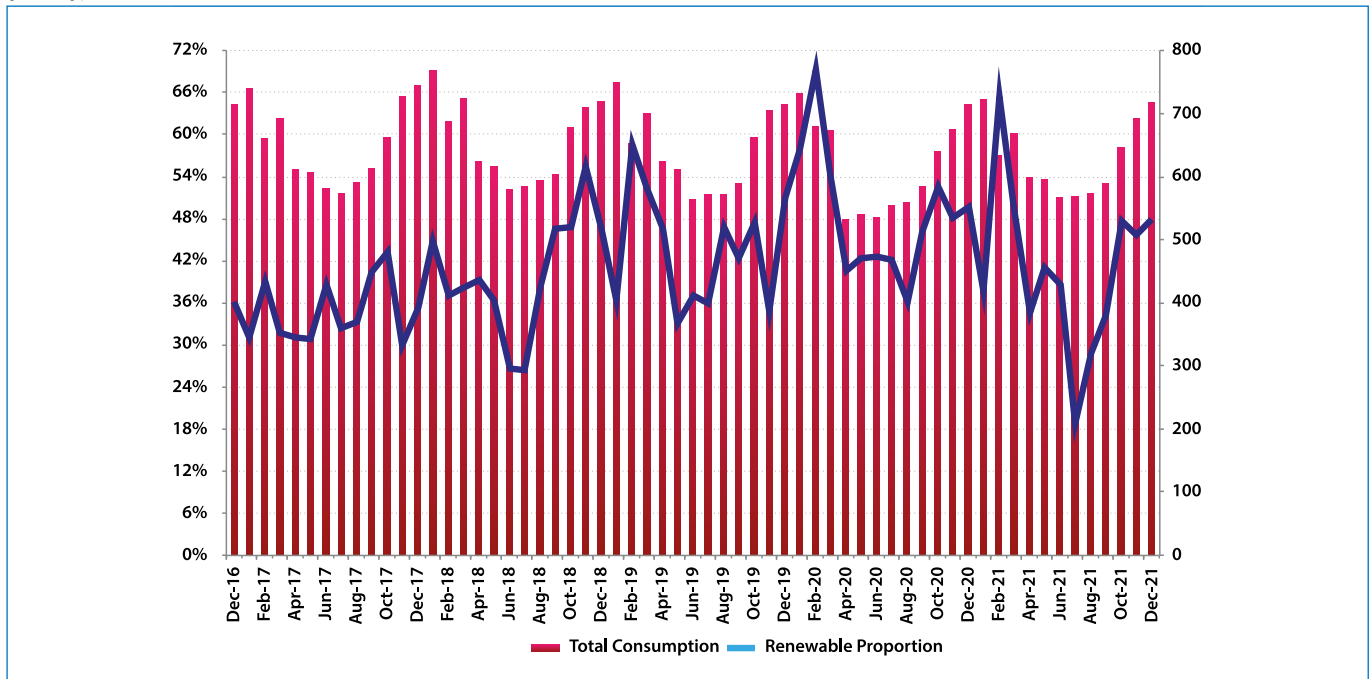
¹²⁶ Solar panels on domestic properties can be installed without the need to apply for planning permission provided a number of limitations and conditions are met (see [Photovoltaic panels, nidirect website](#) for further details).



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 4.6 Percentage of Electricity Consumption from Renewable Sources and Total Consumption Volume by Month (GWh), December 2016 to December 2021



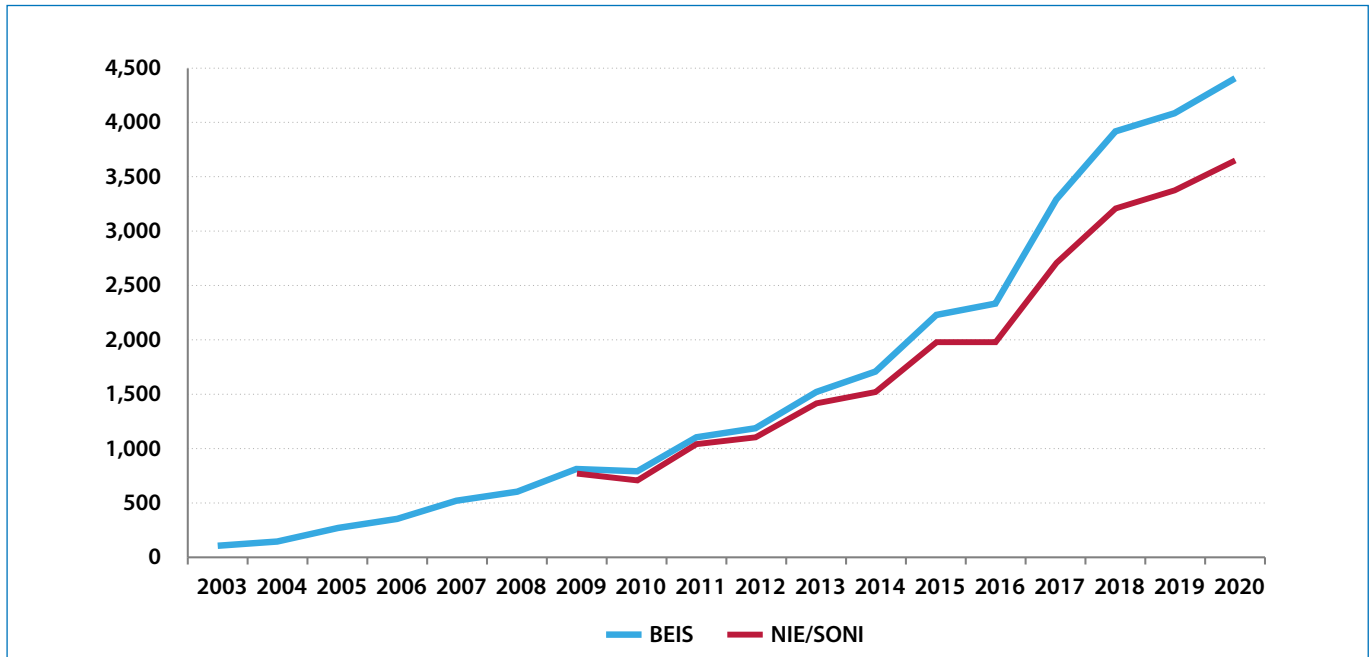
Source: DfE ([Northern Ireland Renewable Electricity Data Tables, Department for the Economy website](#))



Annex 4.2 Comparisons of Annual Renewable Generation Volume Data

BEIS have published a consistent series on annual renewable generation volumes from 2003 onwards¹²⁷ and the most recent data from this series was presented in Table 4.5 earlier. NIE Networks Ltd provide data to DfE on a monthly basis to allow the compilation of the 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 4.7 Annual Volume of Renewable Electricity Generated from BEIS and NIE Networks/SONI sources (GWh), 2003 to 2020



Source: BEIS ([Regional Renewable Statistics, Gov.uk website](#)); NIE Networks and SONI data provided to DfE ([Northern Ireland Renewable Electricity Data Tables, Department for the Economy website](#))

The chart shows that the general trend in each series is very similar. For example, data from both sources show a fall in renewable electricity generation between 2009 & 2010 and little or no change between 2015 & 2016. In both series large annual increases in generation of the same order are evident between 2010 & 2011 and 2016 & 2017 (around 40%), between 2012 & 2013 and 2014 & 2015 (around 30%) and between 2017 & 2018 (about 20%). Again, for the most recent years where data is available for both sources (2019 & 2020) the annual increase was the same at about 8%. So, whilst the volumes might be different between sources the annual changes are very similar.

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, increased again to 18% in 2016 and were 21-22% higher in each year 2017-2020.

The renewable electricity generation data published by DfE is derived by aggregating output from renewable electricity generators who are directly connected to the transmission and distribution network using a combination of data held by NIE Networks and SONI. Microgenerators and any other ‘off-grid’ generators would not be included as they are not directly connected to the transmission and distribution network and thus SONI/NIE Networks would have no sight of their generation.

127 Available at [Regional Renewable Statistics, Gov.uk website](#).



The BEIS data is derived from a combination of sources: a survey of electricity generators (which may include some generators who are not directly connected to the transmission and distribution network) and ROCs data which covers smaller sites and includes microgeneration. In addition, the BEIS methodology booklet¹²⁸ notes that 'where generation data are not directly available, an estimate is derived using the capacity and applying typical monthly load factors (by region if possible) from similar installations'. So this also may have had some impact on the differences between the two sources.

Overall, the inclusion of microgeneration data by BEIS and possibly generation from other generators not directly connected to the grid plus some estimation may account for the observed differences. However without access to site level data from each source, it is difficult to fully quantify where the differences lie but it is reassuring that the annual changes in generation from each source are so similar.

128 Further detail is available at [Renewable energy statistics: data sources and methodologies. Gov.uk website.](#)



Annex 4.3 Comparisons of Annual Renewable Percentages

The table below shows the renewable percentages for Northern Ireland as produced by DfE and BEIS for the period 2010-2020. BEIS proportions are based on indigenous generation only – that is, renewable electricity generation in Northern Ireland divided by all electricity generation in Northern Ireland. The percentages published by DfE, to report against the various targets, are renewable generation in Northern Ireland divided by total electricity consumption in Northern Ireland.

Therefore, when electricity imports are higher than exports (as shown by positive values in the last column of Table 4.10), the consumption of this imported electricity is taken into account within the DfE figure but not in the BEIS proportion (as the imported electricity was not generated in NI) and thus the DfE percentage will be lower than the BEIS percentage.

When exports are higher than imports (as shown by negative values in the last column of Table 4.10), this means Northern Ireland generated more electricity than it needed to meet indigenous demand (with the excess electricity exported and consumed outside NI). Therefore, electricity generated in Northern Ireland which is then exported and consumed outside Northern Ireland will be included within the BEIS proportion (as the electricity was generated in NI) but not in the DfE figure (as the electricity wasn't consumed in NI) and thus the DfE percentage will be higher than the BEIS percentage (as seen for the years 2017 and 2020).

In general, the higher the net import figure (either positive or negative) the higher the difference will be between the two measures.

Table 4.10: Comparison of BEIS and DfE Renewable Electricity Generation Proportions, 2010 to 2020

	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%	10.0%	1.7	2,297	-234	2,064
2011	12.5%	13.8%	1.3	1,769	-245	1,524
2012	13.6%	16.0%	2.4	2,162	-160	2,002
2013	17.3%	19.5%	2.1	1,541	-45	1,495
2014	19.0%	21.6%	2.6	1,044	121	1,165
2015	25.4%	25.5%	0.1	191	334	526
2016	25.4%	25.4%	0.0	-252	399	147
2017	34.7%	34.0%	-0.7	-145	-110	-255
2018	40.7%	42.0%	1.3	707	-471	236
2019	43.7%	44.0%	0.3	981	-825	156
2020	49.2%	45.6%	-3.7	296	-753	-456

Source: DfE ([Electricity Consumption and Renewable Generation Statistics, Department for the Economy website](#)) and BEIS ([Energy Trends: December 2021. Special feature article - Electricity generation and supply in Scotland, Wales, Northern Ireland and England, 2016 to 2020. Gov.uk website](#)) and [Energy Trends: UK electricity. Gov.uk website](#).

The proportion published by BEIS were around 2 percentage points higher than the corresponding figure published by DfE between 2010 and 2014 when net imports of electricity were high. In 2015 and 2016, net imports were much lower (though still positive) and the proportions were almost identical. In 2017 and 2020 the DfE proportion was higher than the BEIS figure (as NI was a net exporter of electricity in these years).

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 4.8 should be used to compare Northern Ireland with other UK countries.



Annex 4.4 Mapping Old Council Areas to New Super Council Areas

Table 4.6 presented data for the current 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 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 site numbers, capacity and generation for the new council areas.

New Council Areas:	Old Council Areas included in aggregation for Table 4.6:
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 Renewable Electricity Data for the Previous 26 District Council Areas, 2020

District Council	Number of sites	Capacity (MW)	Generation (MWh)
Antrim	62	44	79,357
Ards	36	14	30,464
Armagh	59	16	60,678
Ballymena	68	112	236,533
Ballymoney	60	186	339,989
Banbridge	62	13	44,994
Belfast	23	37	79,747
Carrickfergus	11	3	4,941
Castlereagh	13	3	10,844
Coleraine	69	65	202,877
Cookstown	62	20	59,131
Craigavon	27	18	39,498
Derry	39	95	332,740
Down	54	9	24,571
Dungannon	73	74	194,879
Fermanagh	83	202	523,845
Larne	48	8	25,987
Limavady	37	123	302,802
Lisburn	62	100	154,808
Magherafelt	59	32	106,488
Moyle	17	3	7,912
Newry & Mourne	48	9	30,266
Newtownabbey	23	36	77,460
North Down	6	1	4,072
Omagh	107	271	655,816
Strabane	95	240	606,869
Unallocated	24,745	129	-
Total	26,048	1,860	4,237,568
Unallocated (%)	95%	7%	0% ¹²⁹

Source: BEIS ([Regional Renewable Statistics, Gov.uk website](#))

The table above shows that renewable generation and capacity is not shared equally among the previous District Council Areas. Indeed over two fifths (41%) of generation is accounted for by only three of the previous 26 council areas: Omagh (15%), Fermanagh (13%) and Strabane (13%). This is perhaps unsurprising given the number of large onshore wind turbines located in these council areas¹³⁰.

129 Whilst unallocated information in the table above is taken directly from BEIS published data, generation data from BEIS for Northern Ireland (as shown in Table 4.5) was 4,407 GWh for 2020 compared to 4,238 GWh for 2020 in the district council breakdown above published by BEIS: this is a difference of 169 GWh or 4% which could be considered to be unallocated data.

130 See [Interactive Wind Energy Map, Wind Energy Ireland website](#) for a map of wind farm locations in Northern Ireland.

Chapter 5:
Total Energy Consumption



Chapter 5: Total Energy Consumption

Summary of Key Points

- In 2019, some 52,476 GWh of total energy was consumed in Northern Ireland. Consumption of these energy products in 2019 was some 4% higher than in 2015.
- The largest contributor to consumed energy is petroleum products, which accounted for around 55% of total final energy consumption in 2019 and around 57-59% in each year 2015-2018. The volume of petroleum products consumed in NI has fallen by 1% over the 5 year period 2014-2019 and by 11% over the ten year period 2009-2019.
- Of the 28,833 GWh of petroleum products consumed in Northern Ireland in 2019, 45% was for Road Transport; a further 26% was due to domestic consumption and around 22% was consumption by industry.
- Coal accounted for less than 4% of final energy consumption in 2019. This has fallen from over 6% in 2015. In 2019, total coal consumption was at its lowest level on record, at some 2,045 GWh and, of this, industry and commerce accounted for around 79% of total coal consumption with domestic sector consumption accounting for the other 21%.
- The total number of gas connections in Northern Ireland continues to rise each year, although rises were not seen across all market segments. Over the five-year period 2016 to 2021 the total number of gas connections in Northern Ireland rose substantially, by over 75,000 or 33%, with gas consumption rising by 26% over the same period.
- The combined total of diesel and petrol consumed in Northern Ireland in 2019 due to road transport was the lowest annual volume on record at under 1.18 million tonnes of oil equivalent. Consumption by diesel cars in Northern Ireland rose by 7% whilst consumption by petrol cars and motorcycles fell by one third (33%) over the period 2009-2019.
- In 2019, 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).
- Total Northern Ireland energy consumption as a proportion of GB consumption has been steady (at around 3.5%) in each year 2015 to 2019.
- In terms of the purpose for using fuels, of the 52,476 GWh of energy consumed an estimated 56% was for Heat, 30% was for Transport and the remaining 14% was for Power.



Introduction

This chapter provides some focus on areas of energy in addition to electricity to provide an overview of total energy consumption in Northern Ireland. It begins by looking at sub-national final energy consumption data produced by BEIS which is available as a historic series at Northern Ireland and sub-Northern Ireland level. It then looks at other sources of information on gas and coal and also in further detail on BEIS road transport (petrol and diesel) consumption statistics for Northern Ireland.

BEIS Total Final Energy Consumption Data

The total final energy consumption datasets published by BEIS cover each region of the United Kingdom, with gas and electricity data now included for Northern Ireland. The datasets 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). It was also not possible to model non-energy use of petroleum products and natural gas. Together these excluded fuels account for around a 15% share of total final energy consumption in the UK¹³¹.

As shown in Table 5.1 overleaf, some 52,476 GWh of energy was consumed in Northern Ireland in 2019. Total energy consumption in Northern Ireland has increased by 4% from 2015. As gas data for Northern Ireland is not included before 2015 and electricity data is not included before 2009 it is not possible to do comparisons over a longer time period for BEIS-published total energy consumption. However, as shown in the table, values for some individual energy types are available back to 2005.

By far the largest contributor to these sources of consumed energy is petroleum products¹³²: these accounted for 55% of total final energy consumption in 2019 and around 57-59% in each year 2015-2018. The volume of petroleum products consumed in NI has fallen by 1% over the 5 year period 2014-2019 and by 11% over the ten year period 2009-2019.

Electricity and gas each contributed around 14% of total final energy consumption in Northern Ireland in 2019. Electricity consumption values published by BEIS have been fairly steady since 2013 while gas consumption has shown a 19% rise, reflecting the extension of the gas network. The consumption of bio energy and waste products has seen its share increase from around 7% in 2015 to 13% in the 2019.

Of the 28,833 GWh of petroleum products consumed in Northern Ireland in 2019, 45% was for Road Transport; a further 26% was due to domestic consumption and around 22% was consumption by industry.

Coal accounted for less than 4% of final energy consumption in 2019. This has fallen from over 6% in 2015. In 2019, total coal consumption was at its lowest level for the 15-year period shown, at some 2,045 GWh and, of this, industry and commerce accounted for around 79% of total coal consumption with domestic sector consumption accounting for the other 21%.

131 See page 50 of the Sub-national Consumption Statistics Guidance Booklet ([Subnational Consumption Statistics: methodology and guidance, Gov.uk website](#)) for further details.

132 Petroleum products include petrol, diesel and home heating oil.



Table 5.1 Northern Ireland Final Energy Consumption (GWh), 2005-2019

Year	Coal ⁽¹⁾			Manufactured fuels ⁽²⁾			Petroleum products ⁽¹⁾							Gas ⁽⁴⁾			Electricity ⁽⁴⁾			Bioenergy & wastes				All fuels	Consuming Sector		
	I&C	Dom	Total	I&C	Dom	Total	I&C	Dom	Road ⁽³⁾	Rail	Pub Sec	Agri	Total	I&C	Dom	Total	I&C	Dom	Total	I&C	Dom	Road	Total	Total	I&C	Dom	Road
2005	1,842	550	2,392	261	414	675	9,771	8,456	14,714	117	368	1,824	35,250	..	..	..	..	..	..	554	629	26	1,209	39,525	14,619	10,050	14,856
2006	2,122	496	2,617	215	395	610	8,904	9,171	15,008	116	279	1,738	35,217	..	..	..	..	..	..	583	657	72	1,312	39,757	13,842	10,718	15,197
2007	2,021	568	2,589	156	362	518	8,801	8,394	15,205	137	235	1,651	34,423	..	..	..	..	..	..	325	667	140	1,131	38,661	13,188	9,991	15,482
2008	2,181	601	2,783	142	424	566	7,268	8,716	15,100	140	163	1,614	33,001	..	..	..	..	..	..	253	791	338	1,382	37,731	11,621	10,533	15,578
2009	2,017	602	2,619	110	317	428	6,463	8,957	14,923	140	100	1,636	32,220	..	..	..	4,792	3,146	7,938	751	862	418	2,031	45,236	15,871	13,883	15,482
2010	2,514	628	3,143	103	353	456	7,001	10,210	14,549	140	77	1,650	33,628	..	..	..	4,893	2,978	7,870	897	1,111	470	2,478	47,574	17,135	15,280	15,159
2011	2,411	620	3,032	103	321	423	6,482	7,965	14,299	139	145	1,675	30,705	..	..	..	4,560	2,826	7,386	990	965	431	2,386	43,933	16,367	12,697	14,869
2012	2,648	593	3,241	108	326	434	5,590	8,017	14,123	139	81	1,724	29,674	..	..	..	4,347	3,027	7,374	850	1,227	367	2,445	43,167	15,348	13,190	14,630
2013	3,412	568	3,980	212	356	568	5,238	8,651	13,984	142	60	1,704	29,779	..	..	..	4,692	3,114	7,807	780	1,445	420	2,645	44,779	16,098	14,135	14,547
2014	3,322	485	3,807	220	324	544	5,873	7,419	13,879	146	67	1,720	29,103	..	..	..	4,706	2,934	7,640	1,404	1,373	460	3,237	44,332	17,312	12,534	14,485
2015	2,660	488	3,149	71	318	388	6,433	7,467	13,615	146	76	1,792	29,529	3,627	2,298	5,924	4,712	2,925	7,637	1,826	1,551	358	3,735	50,362	21,198	15,046	14,118
2016	2,539	485	3,023	30	314	344	6,733	7,500	13,637	146	77	1,894	29,986	3,415	2,411	5,827	4,723	2,907	7,630	2,314	1,669	358	4,340	51,151	21,724	15,286	14,140
2017	2,105	473	2,578	37	336	373	6,785	7,079	13,485	145	80	1,876	29,450	3,729	2,833	6,562	4,750	2,957	7,706	3,354	1,660	349	5,363	52,033	22,715	15,339	13,979
2018	1,830	458	2,288	35	341	376	6,843	7,458	13,425	137	85	1,868	29,816	3,538	2,735	6,273	4,708	2,899	7,607	4,114	1,811	479	6,404	52,764	23,021	15,701	14,041
2019	1,610	435	2,045	34	320	354	6,226	7,400	13,111	137	82	1,877	28,833	4,068	3,006	7,074	4,575	2,897	7,472	4,210	1,870	618	6,698	52,476	22,681	15,928	13,867

Source: BEIS ([Total final energy consumption at regional and local authority level: 2005 to 2019, Gov.uk website](#))

Notes:

- (1) For coal and petroleum, industry consumption includes all consumption from the following sectors, as defined in the Digest of UK Energy Statistics (DUKES): Industry, Energy Industry use, Heat Generation, Miscellaneous. Excludes coal used for electricity generation (or other transformation purposes). I&C coal consumption includes a small amount of consumption in Rail, Public Sector and Agriculture.
- (2) Includes only manufactured solid fuels and not derived gases.
- (3) Biofuels blended into road fuels are removed from petroleum and re-allocated to "Bioenergy and wastes" using an estimated percentage.
- (4) No electricity or gas consumption figures are available from BEIS for Northern Ireland for earlier years (prior to 2009 for electricity and prior to 2015 for gas).

Table Key: I&C = Industrial & Commercial; Dom = Domestic; Road = Road Transport; Pub Sec = Public Sector; Agri = Agriculture.



Sub-Northern Ireland Final Energy Consumption Estimates

Final energy consumption data including electricity and gas are now also published by BEIS at District Council Area level: the latest available data is for 2019 and the figures relate to the current eleven council areas. Table 5.2 overleaf shows that the Belfast council area had the highest volume of energy consumption: it accounted for 6,695 GWh of consumption or 12.8% of the Northern Ireland total. Two other council areas, Armagh City, Banbridge & Craigavon (6,111 GWh, 11.6%) and Mid Ulster (5,989 GWh, 11.4%) had consumption of around 6,000 GWh with all other council areas having final energy consumption under 5,000 GWh for 2019.

Petroleum Products

Armagh City, Banbridge & Craigavon council area was the district council with the largest share of Northern Ireland consumption of petroleum products in 2019 (at 3,678 GWh or 12.8% of total NI consumption), closely followed by Newry, Mourne & Down (at 3,623 GWh or 12.6% of the total) and Mid Ulster (at 3,589 GWh or 12.4% of the total). All three of these council areas had more than two and a half times the petroleum products consumption than the council area with the lowest consumption of petroleum products in 2019 (Ards & North Down which had 1,426 GWh of consumption or 4.9% of the total). Looking at petroleum products consumption as a share of all fuels by council area highlights some differences. In 2019, about one third (32%) of total final energy consumption in Belfast council area was due to petroleum product consumption while the corresponding proportions in Newry, Mourne & Down (73%), Causeway Coast & Glens (67%) and Fermanagh & Omagh (64%) were significantly higher.

Gas and Electricity

Gas consumption accounted for some 38% of total final energy consumption for Belfast council area but only 3% or less in three council areas: Newry, Mourne & Down, Fermanagh & Omagh and Mid Ulster. Electricity consumption accounted for 22% of total energy consumption for Belfast but was close to the Northern Ireland average of 14% for the other ten council areas.

Coal

While coal represents a much smaller proportion of consumption in overall volume terms, it is interesting to note that two council areas, Derry City & Strabane (26.2%) and Mid Ulster (23.9%) together accounted for half of all coal consumption in Northern Ireland in 2019.

Consuming Sector

Over half of all final energy consumption in Mid Ulster (57.3%), Derry City & Strabane (52.6%) and Fermanagh & Omagh (50.3%) was due to consumption by industry/commercial compared to only 23% for Ards & North Down. Conversely, around half of final energy consumption in Ards & North Down (52.6%) and Belfast (45.8%) was due to domestic consumption compared to only 18.4% in Mid Ulster and 20.3% for Fermanagh & Omagh.

[Note that Table 5.2 overleaf is an abridged version of the District Council analysis available. Further sector splits (industrial, commercial, domestic, road transport etc.) of fuel types consumed by council area are available at the link given below the table].



Table 5.2 Northern Ireland Final Energy Consumption by District Council Area (GWh), 2019

Area	Coal ⁽¹⁾	Manufactured Fuels ⁽²⁾	Petroleum products ⁽¹⁾	Gas	Electricity	Bioenergy & Wastes	All Fuels	Consuming Sector			All fuels as a % of NI total
	Total	Total	Total	Total	Total	Total	Total	Industrial	Domestic	Transport	
Antrim & Newtownabbey	141	22	2,245	542	575	617	4,141	1,733	1,239	1,169	7.9%
Ards & North Down	49	26	1,426	697	480	261	2,939	675	1,547	717	5.6%
Armagh City, Banbridge & Craigavon	183	39	3,678	646	903	663	6,111	2,471	1,717	1,923	11.6%
Belfast	42	41	2,173	2,550	1,465	424	6,695	2,503	3,068	1,124	12.8%
Causeway Coast & Glens	95	33	2,540	258	501	376	3,802	1,222	1,232	1,349	7.2%
Derry City & Strabane	535	36	2,118	472	669	683	4,513	2,373	1,216	924	8.6%
Fermanagh & Omagh	121	29	3,020	*	535	983	4,688	2,356	953	1,379	8.9%
Lisburn & Castlereagh	135	22	1,925	779	502	599	3,963	1,630	1,214	1,119	7.6%
Mid and East Antrim	124	26	2,494	505	492	509	4,151	1,875	1,234	1,041	7.9%
Mid Ulster	488	45	3,589	*	726	1,141	5,989	3,435	1,104	1,449	11.4%
Newry, Mourne & Down	133	36	3,623	161	601	442	4,995	1,924	1,399	1,673	9.5%
Unallocated	0	0	0	464	25	0	489	483	6	0	0.9%
Northern Ireland	2,045	354	28,833	7,074	7,472	6,698	52,476	22,681	15,928	13,867	100.0%

Source: BEIS ([Total final energy consumption at regional and local authority level: 2005 to 2019, Gov.uk website](#))

Notes to table: (1) For coal and petroleum, industry consumption includes all consumption from the following sectors, as defined in the Digest of UK Energy Statistics (DUKES): Industry, Energy Industry use, Heat Generation, Miscellaneous. Excludes coal used for electricity generation (or other transformation purposes). I&C coal consumption includes a small amount of consumption in Rail, Public Sector and Agriculture. (2) Includes only manufactured solid fuels and not derived gases.



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 supply¹³³.

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 Limited (PNGL) operates the network in the Greater Belfast and Larne distribution licensed area¹³⁴, firmus energy (Distribution) Limited (feDL) operates the network in the 'Ten Towns' distribution licensed area¹³⁵ and SGN Natural Gas Limited (SGN) operates the network in the West distribution licensed area¹³⁶.

133 The information on transmission, distribution and supply was sourced from the Utility Regulator ([Gas, Utility Regulator website](#)) and also [Gas, Northern Ireland Executive website](#) and [Gas, Department for the Economy website](#).

134 The Greater Belfast and Larne area includes Holywood, Bangor, Newtownards, Belfast, Newtownabbey, Carrickfergus and Lisburn. An extension to the Phoenix Natural Gas licence provided new gas infrastructure to towns and villages in East Down, including Annahilt, Ballygowan, Ballynahinch, Castlewellan, Crossgar, Downpatrick, Dromore, Drumanness, Dundrum, Hillsborough, Newcastle, Saintfield and The Spa.

135 These ten towns being: Londonderry, Limavady, Ballymena, Ballymoney, Coleraine, Newry, Craigavon, Antrim, Banbridge and Armagh. firmus has taken natural gas to some 20 additional urban areas, such as Tandragee, Warrenpoint, Moy and Bushmills.

136 SGN Natural Gas is responsible for providing gas to main towns in the west including Dungannon, Cookstown, Magherafelt, Coalisland, Omagh, Strabane, and Enniskillen/Derrylin.



Supply¹³⁷

Gas supply companies supply customers with gas into their homes/businesses. In the Greater Belfast market, three suppliers were active in supplying gas to domestic customers (as at end December 2021): SSE Airtricity (79% of connections), firmus energy (21%) and Go Power (<1%) and six suppliers are active in supplying gas to industrial & commercial customers: SSE Airtricity, firmus, Flogas, Go Power, Naturgy and Electric Ireland.

In the Ten Towns market, there was one supplier active in supplying gas to domestic customers (firmus) and five suppliers active in supplying industrial & commercial customers: SSE Airtricity, firmus, Flogas, Go Power and Electric Ireland.

In the West area, SSE Airtricity is the sole domestic supplier, with SSE Airtricity, firmus, Flogas, Go Power and Electric Ireland active in the industrial & commercial market.

Gas Connections

The next table shows the number of connections in each of the three distribution networks split by domestic and Industrial & Commercial (I&C) sectors where available¹³⁸.

Table 5.3 shows that in 2021 over 98% of connections were in the domestic and small I&C sector in the Greater Belfast network (operated by Phoenix Natural Gas), the Ten Towns area (operated by firmus energy) and the West area (operated by SGN).

Of the over 303,000 total connections to the gas network in 2021, some 79.1% are in the Greater Belfast area, 20.1% in the Ten Towns area and the remaining 0.8% in the West 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 14.2% in 2016 to 20.1% in 2021) and also the West area (the first connections there were in 2017 and connection numbers have increased quickly each year to almost 2,400 in 2021). Those I&C customers with 73,200 kWh or more of consumption and connected to any of the three networks made up only 1.4% of total connections in Northern Ireland in 2021. However, as Table 5.4 shows below, these customers are responsible for 54% of total Northern Ireland gas consumption.

Data for 2016 has been included in Table 5.3 to highlight the significant increase in gas connections in recent years. Over the five-year period 2016 to 2021 the total number of gas connections in Northern Ireland rose substantially, by over 75,000 or 33%. Over the same period, the rise in the number of connections in the Greater Belfast area was around 44,500 (23%) whilst connections in the Ten Towns area almost doubled (a rise of around 29,000 or 90%).

137 Information in this section is from [Q4 2021 Quarterly Retail Energy Market Monitoring Report, Northern Ireland Utility Regulator website](#) published 28th February 2022.

138 Connections and consumption for domestic and small I&C customers are grouped together (relating to those customers consuming <73,200 kWh/annum). Information for the West area are only available for 2018 onwards.



Table 5.3 Number of Gas Connections in Northern Ireland by Distribution Licensed Area, 2016 and 2019 to 2021

Market Segment	Connections at end of					As a % of total connections in 2021
	2016	...	2019	2020	2021	
Greater Belfast	195,437		222,502	230,679	239,853	79.1%
Domestic & Small I&C ¹³⁹	192,283		219,277	227,525	236,848	78.1%
I&C 73,200 - 732,000 kWh	2,767		2,829	2,756	2,567	1.0%
I&C > 732,000 - 2,196,000 kWh	280		279	277	304	0.0%
I&C > 2,196,000 kWh	107		117	121	134	0.0%
Ten Towns	32,235		49,062	54,552	61,088	20.1%
Domestic & Small I&C	31,075		47,806	53,323	59,871	19.7%
I&C 73,200 - 732,000 kWh	911		1,010	977	963	0.4%
I&C > 732,000 - 2,196,000 kWh	158		160	165	164	0.0%
I&C > 2,196,000 kWh	91		86	87	90	0.0%
West	0		568	1,327	2,395	0.8%
Domestic & Small I&C	0		550	1,297	2,353	0.8%
I&C 73,200 - 732,000 kWh	0		7	11	20	0.0%
I&C > 732,000 - 2,196,000 kWh	0		2	5	8	0.0%
I&C > 2,196,000 kWh	0		9	14	14	0.0%
Total	227,672		272,132	286,558	303,336	100.0%
Domestic & Small I&C	223,358		267,633	282,145	299,072	98.6%
I&C 73,200 - 732,000 kWh	3,678		3,846	3,744	3,550	1.4%
I&C > 732,000 - 2,196,000 kWh	438		441	447	476	0.0%
I&C > 2,196,000 kWh	198		212	222	238	0.0%

Source: NI Utility Regulator ([Market Information, Utility Regulator website](#))

The connection numbers shown in the table for the West distribution area are expected to continue growing rapidly in future years. Natural gas is now available to properties in Artigarvan, Coalisland, Cookstown, Derrylin, Dungannon, Enniskillen, Magherafelt, Omagh and Strabane after the final section of the new network was commissioned in December 2019. This will eventually provide some 40,000 business and domestic consumers with an additional fuel choice¹⁴⁰.

Over the five-year period 2016-2021, there was a 33% rise in total gas connections but rises were not seen across all market segments. In particular, there was a fall of 3.5% in connections in the 'I&C 73,200 - 732,000 kWh' group: an overall fall of 128 connections with a fall of 200 connections in this group in Greater Belfast but rises of 52 in the Ten Towns area and 20 in the West area. Connections in the Domestic & Small I&C sector increased by 34% over the five-year period 2016-2021, with smaller but still significant rises of 9% and 20% respectively in the two largest consuming I&C groups.

139 The domestic and small I&C sector relates to any customers using less than 73,200 kWh per annum.

140 See [Eight Northern Ireland towns can connect to natural gas following network launch, SGN website](#).



Gas Consumption

Table 5.4 Annual Gas Consumption (GWh) in Northern Ireland by Distribution Licensed Area, 2016 and 2019 to 2021

Market Segment	Consumption (GWh) during					As a % of total consumption in 2019
	2016	...	2019	2020	2021	
Greater Belfast	4,160		4,624	4,648	4,765	64%
Domestic & Small I&C	2,232		2,604	2,717	2,808	38%
I&C 73,200 - 732,000 kWh	586		626	627	584	8%
I&C > 732,000 - 2,196,000 kWh	316		324	302	319	4%
I&C > 2,196,000 kWh	1,026		1,070	1,002	1,054	14%
Ten Towns	1,774		1,806	1,872	1,995	27%
Domestic & Small I&C	275		464	528	618	8%
I&C 73,200 - 732,000 kWh	241		238	245	239	3%
I&C > 732,000 - 2,196,000 kWh	180		217	180	192	3%
I&C > 2,196,000 kWh	1,078		887	918	946	13%
West	0		323	698	724	10%
Domestic & Small I&C	0		4	12	19	0%
I&C 73,200 - 732,000 kWh	0		1	2	3	0%
I&C > 732,000 - 2,196,000 kWh	0		1	4	7	0%
I&C > 2,196,000 kWh	0		318	680	695	9%
Total	5,935		6,754	7,218	7,484	100%
Domestic & Small I&C	2,507		3,071	3,257	3,446	46%
I&C 73,200 - 732,000 kWh	826		866	875	825	11%
I&C > 732,000 - 2,196,000 kWh	496		542	486	518	7%
I&C > 2,196,000 kWh	2,105		2,275	2,600	2,695	36%

Source: NI Utility Regulator ([Market Information, Utility Regulator website](#))¹⁴¹

As shown above total gas consumption in the domestic and I&C sectors in Northern Ireland continues to grow and was 7,484 GWh in 2021. Some 64% of total consumption in 2021 was in the Greater Belfast network area, 27% in the Ten towns licensed area and the remaining 10% in the West network area. Over the period 2019-2021, there was an 11% rise in total gas consumption in Northern Ireland (an increase of over 730 GWh) and a 26% rise (+1,550 GWh) over the five year period 2016-2021.

Over the five-year period 2016-2021, there were similar rises in gas consumption in the Greater Belfast area (+14.5%) and Ten Towns area (+12.5%). However, the changes for each market segment were quite different.

In the Greater Belfast area, consumption in the domestic and small I&C sector rose by 26% whilst consumption in the same sector in the Ten Towns area in 2021 was more than double that in 2016 (+125%). Consumption in the West area for this group is small (only 19 GWh in 2021) but this is expected to continue growing as the gas network there rolls out. For Northern Ireland, gas consumption in the domestic and small I&C sector increased from 2,507 GWh in 2016 to 3,446 GWh in 2021, a 37% increase.

141 Data for this table is derived from Annual and Quarterly Utility Regulator's Transparency Reports. 2019-2021 data is calculated from the four Quarterly Transparency Reports for the respective years.



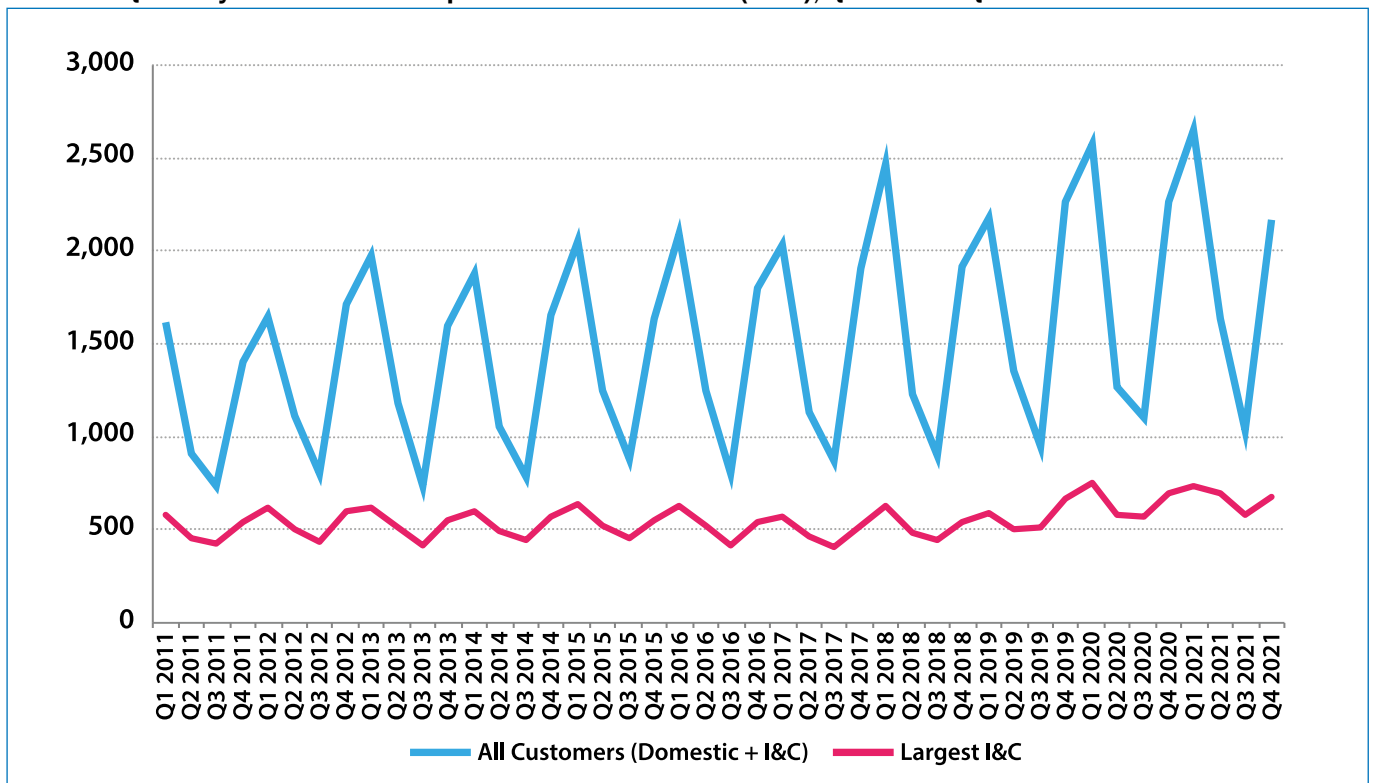
Such increases are perhaps expected given the gas network rollout over the period reflects the shift towards gas rather than home heating oil central heating¹⁴².

In the largest consuming group (I&C > 2,196,000 kWh) there was a 12% fall in consumption (-132 GWh) in the Ten Towns area over the 5 year period 2016 to 2021 and consumption was fairly steady for this group each year in the Greater Belfast area at around 1,000 GWh. Overall, consumption for the largest consuming group in these two gas network areas combined fell by 105 GWh between 2016-2021. However, in the West network area consumption went from zero in 2016 to 695 GWh in 2021 for the largest consuming group. Overall, and due largely to the increase in the West area, consumption for this group in the three gas network areas increased by 28% over the five-year period.

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 to Q4 2021



Source: NI Utility Regulator ([Market Information, Utility Regulator website](#))

Overall consumption (domestic plus Industrial & Commercial (I&C) customers) is considerably lower over the second and third quarters of the year (i.e. during the spring and summer months), and peaks during the winter months (i.e. in Q1 and Q4). Given that customers will use gas as the main fuel for heating purposes, this trend is expected.

The chart also shows consumption for the largest Industrial & Commercial (I&C) customers – i.e. the approximately 200 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).

142 There is evidence, as shown in Chapter 6, that the proportion of households in Northern Ireland using gas for central heating has increased in recent years.



For example, the average change from Q3 to Q4 for the largest I&C group over the period shown was an increase of around 27%, 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.

Data showing the number of meters and gas consumption at a District Council level for Northern Ireland was first published by BEIS in October 2019 and the most recent data is shown overleaf.



Table 5.5 Northern Ireland Gas Consumption, Number of Meters and Average Consumption by District Council Area, 2020 Gas Year

Area	Number of meters			Consumption (GWh)			Average Consumption (kWh)		
	Domestic	Non-domestic	Total	Domestic	Non-domestic	Total	Domestic	Non-domestic	Total
Antrim & Newtownabbey	25,295	1,073	26,368	310.3	262.5	572.8	12,266	244,681	21,724
Ards & North Down	37,464	1,524	38,988	508.1	231.9	740.1	13,563	152,179	18,982
Armagh City, Banbridge & Craigavon	13,980	713	14,693	142.3	550.3	692.6	10,177	771,875	47,140
Belfast	122,518	6,787	129,305	1,455.8	1,191.3	2,647.1	11,882	175,531	20,472
Causeway Coast & Glens	7,835	406	8,241	77.1	198.7	275.8	9,840	489,407	33,466
Derry City & Strabane	16,380	754	17,134	162.6	360.5	523.1	9,928	478,133	30,532
Fermanagh & Omagh	491	*	*	5.2	*	*	10,625	*	*
Lisburn & Castlereagh	27,962	1,512	29,474	357.6	456.1	813.7	12,789	301,643	27,607
Mid and East Antrim	20,468	1,092	21,560	233.6	304.4	538.0	11,415	278,742	24,955
Mid Ulster	467	*	*	4.9	*	*	10,461	*	*
Newry, Mourne & Down	5,575	362	5,937	55.9	128.6	184.5	10,027	355,253	31,077
Northern Ireland	278,435	14,255	292,690	3,313.4	4,262.8	7,576.3	11,900	299,042	25,885

Source: BEIS ([Sub-national gas consumption statistics in Northern Ireland](#))

Note: the data in the table above covers the 2020 gas year, which is the period 15th May 2020 to 15th May 2021. This will differ to data in Tables 5.3 and 5.4 earlier, which relate to the calendar year 2020. In addition, the table above splits consumption and number of meters by domestic or non-domestic whereas in Tables 5.3 and 5.4 Domestic and small Industrial & Commercial are grouped together. Where * is shown, figures have been suppressed to ensure that the statistics are not disclosive.



Gas Consumption – District Council Level

Table 5.5 shows that there was some level of gas consumption in all District Council areas in Northern Ireland in the 2020 Gas Year. Unsurprisingly, the majority of gas consumption is in urban council areas and where the gas network is well established. Belfast District Council area on its own accounted for over one third (35%) of all Northern Ireland gas consumption, with Lisburn and Castlereagh accounting for another 11% of all gas consumption. Together homes and businesses located in these two council areas were responsible for around half (46%) of all gas consumption in Northern Ireland.

Number of Meters – District Council Level

Understandably, the majority of meters are located in council areas that have the highest consumption values. Some 44% of all meters were in Belfast District Council area, 13% of all meters were in Ards & North Down followed by Lisburn and Castlereagh (10%). These three council areas accounted for over two thirds (68%) of all domestic and non-domestic meters.

There is a strong relationship between the number of gas meters and gas consumption in the domestic sector. For example, Belfast has 44% of all domestic gas meters and 44% of domestic gas consumption, Ards & North Down has 13% of meters and 15% of consumption and Lisburn & Castlereagh has 10% of meters and 11% of consumption. However, even small differences in these proportions can lead to some notable differences in consumption per meter as shown below.

Consumption per Meter – District Council Level

Table 5.5 shows consumption per meter and there is some variation in average domestic consumption across the council areas (although all average consumption values for councils are within about 20% of the NI average value). Four council areas had average domestic consumption values for 2020 close to or below 10,000 kWh (Armagh City, Banbridge & Craigavon, Causeway Coast & Glens, Derry City & Strabane and Newry, Mourne & Down) and three areas had average domestic consumption values for 2020 above 12,000 kWh (Antrim & Newtownabbey, Ards & North Down and Lisburn and Castlereagh). Indeed, average domestic consumption values for 2020 in Ards & North Down at 13,563 kWh were some 38% above the council area with the lowest average domestic consumption (Causeway Coast & Glens at 9,840 kWh).

Ofgem produce Typical Domestic Consumption Values (TDCVs)¹⁴³ which are industry standard values for the annual gas usage of a typical domestic consumer. For 2020, TDCVs for gas show that annual consumption of 8,000 kWh per year would be considered 'low' usage; consumption of 12,000 kWh per year would be considered medium (or average) usage and 17,000 kWh per annum would be deemed 'high' usage. The Northern Ireland average for domestic customers for 2020 was 11,900 kWh, so this appears to be typical consumption. Gas consumption in individual households can be affected by a number of factors such as cost of gas, how well insulated the house is, the type and size of house, number of occupants etc. In particular, floor area is an important determinant of gas demand, with the largest floor area category (over 200 square metres), consuming about four times as much gas as the smallest category (50 square metres or less)¹⁴⁴. This may be one of the factors that accounts for some of the differences evident in gas consumption across District Council areas in Northern Ireland.

143 See [Decision for Typical Domestic Consumption Values 2020, Ofgem website](#).

144 See page 9 from 'National Energy Efficiency Data – Framework' published by BEIS ([National Energy Efficiency Data Framework \(NEED\) Summary 2021, Gov.uk website](#)).



Table 5.6 Northern Ireland Gas Consumption and Number of Meters by District Council Area, 2018, 2019 and 2020 Gas Years¹⁴⁵

Council Area	Total Number of Meters			Total Consumption (GWh)		
	2018	2019	2020	2018	2019	2020
Antrim & Newtownabbey	23,628	24,976	26,368	529	542	573
Ards & North Down	35,517	37,278	38,988	661	697	740
Armagh City, Banbridge & Craigavon	11,365	12,905	14,693	620	646	693
Belfast	122,737	126,046	129,305	2,411	2,550	2,647
Causeway Coast & Glens	6,321	7,258	8,241	255	258	276
Derry City & Strabane	13,475	15,392	17,134	436	472	523
Fermanagh & Omagh	0	*	*	0	*	*
Lisburn & Castlereagh	26,436	27,870	29,474	735	779	814
Mid and East Antrim	18,750	20,082	21,560	475	505	538
Mid Ulster	53	*	*	1	*	*
Newry, Mourne & Down	3,848	4,625	5,937	149	161	185
Northern Ireland	262,130	276,554	292,690	6,273	7,074	7,576

Source: BEIS ([Sub-national gas consumption statistics in Northern Ireland, Gov.uk website](#))

Table 5.6 shows total data by District Council for the most recent three years for which data is available. Overall, there was a 12% increase in the number of gas meters in Northern Ireland over the 2018 to 2020 gas years. Over this period, the percentage increase in the number of meters was lower in council areas where the gas network has been longer established - e.g. Belfast (5%), Ards & North Down (10%), Lisburn & Castlereagh (11%) and Antrim & Newtownabbey (12%) - with higher percentage rises in areas where the gas network continued to be expanded over the period shown in the table - e.g. Newry, Mourne & Down (54%), Causeway Coast & Glens (30%), Armagh City, Banbridge & Craigavon (29%) and Derry City & Strabane (27%). There were year-on-year increases in the number of gas meters for all council areas.

In terms of gas consumption, there were also year-on-year increases for all councils. Over the 2018 to 2020 gas years, gas consumption in Northern Ireland increased by 21% with the highest increase in Newry, Mourne & Down (24%). Whilst the figures for Fermanagh & Omagh and Mid Ulster council areas are not available separately, these two council areas have seen increases in gas connections and consumption with the roll out of the Gas to the West project. In 2018, there were only around 50 meters and negligible consumption in these two council areas combined but by 2020 this had grown to almost one thousand meters and around 600 GWh of consumption. Therefore, these two council areas were responsible for around half the increase in gas consumption between 2018 and 2020.

¹⁴⁵ 2018 Gas year is mid-May 2018 to mid-May 2019; 2019 Gas year is mid-May 2019 to mid-May 2020; and 2020 Gas year is mid-May 2020 to mid-May 2021. Where * is shown, figures have been suppressed to ensure that the statistics are not disclosive.



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 5.7 below are inclusive of all sources of coal shipped (bulk cargo and containerised) to Northern Ireland including cross channel and foreign imports.

Table 5.7 Shipments of Coal and Other Solid Fuels¹⁴⁶ into Northern Ireland by type of use¹⁴⁷ (Thousand Tonnes), 2011-2021

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Domestic Use	432	346	674	502	811	744	873	1,100	1,241	977	1,164
Industrial Use	299	348	360	506							
Generation of Electricity	588	1,021	1,047	937	836	926	609	561	460	522	654
All Shipments	1,320	1,716	2,081	1,946	1,647	1,670	1,483	1,661	1,700	1,500	1,818
% of imports used for Electricity Generation	45%	59%	50%	48%	51%	55%	41%	34%	27%	35%	36%

Source: Annual Coal Inquiry, NISRA ([NI Annual Coal Inquiry, Northern Ireland Statistics and Research Agency website](#))

Over one third (36%) of coal imported into Northern Ireland in 2021 was for generation of electricity (as noted in Chapter 3, Kilroot power station near Carrickfergus is mainly coal fuelled). This proportion has fallen markedly in recent years: between 2011 and 2016 the proportion averaged over 50% but has fallen notably since then.

Coal imports for the purpose of generating electricity in 2021 (at some 654 thousand tonnes) were up by over 40% on the 2019 volume. The volume of coal imported for generation of electricity in 2019 (at 460 thousand tonnes) was the lowest level since 1988¹⁴⁸ but there was an annual increase in 2020 and again in 2021.

Coal imported for domestic use typically accounted for between one quarter and one third of all imports between 2011 and 2014. Unfortunately, the split between domestic and industrial use is not available after 2014 so more recent trends in this respect cannot be determined.

In terms of coal imports for use by the domestic/industrial sector, these fell each year from 2013 to 2016 but then began to increase again and volumes in the period 2018-2021 have averaged over 1,100 thousand tonnes, equivalent to levels seen in the mid-1990s.

146 Covers all types of solid fuels including coal, anthracite, lignite, coke and manufactured smokeless fuels.

147 Separate totals for 'Domestic Use' and 'Industrial Use' are not available beyond 2014.

148 The full data series is available at [NI Annual Coal Inquiry, Northern Ireland Statistics and Research Agency website](#).



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)¹⁴⁹.

As Table 5.8 overleaf shows, between 2009 and 2019 the amount of diesel and petrol consumed in Northern Ireland due to road transport fell by 11% (a fall of some 138,600 tonnes of oil equivalent) to about 1.18 million tonnes of oil equivalent (and the lowest annual volume on record¹⁵⁰). Indeed, there was a fall of around 143,200 tonnes in personal consumption (i.e. buses, cars and motorcycles) and a small rise (4,600 tonnes) in freight transport consumption (i.e. HGV and LGV) over this 10-year period.

There has been a marked rise in consumption by diesel cars in Northern Ireland (by around 34,000 tonnes of oil equivalent or 7%) over the period 2009-2019 whilst consumption by petrol cars and motorcycles has fallen by one third over the same period (a fall of around 178,000 tonnes of oil equivalent or 33%). In 2009 consumption by diesel cars was some 12% lower than the volume of consumption by petrol cars (with a difference of around 62,700 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 2019, diesel car consumption was 42% higher than petrol car consumption (around 150,000 tonnes of oil equivalent more diesel than petrol was consumed by cars in 2019).

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 5.8 also shows some key GB proportions for comparison and there are some significant differences. For 2019, except for buses and LGVs, 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 more than twice that of Northern Ireland (around 0.94%¹⁵¹ in GB in 2019 compared to 0.45%¹⁵² in 2019 in Northern Ireland).

Only about 8-9% of diesel and petrol car consumption in Northern Ireland in 2019 was due to the use of such vehicles on motorways, while in GB the proportions were 22% and 15% respectively. Consequently, the use of diesel cars on A-roads is higher in NI than GB (45% to 39%) and also minor roads (47% to 39%). In the freight sector some differences are even more marked. In 2019, only 10% of fuel consumption by HGVs and 8% of fuel consumption by LGVs in NI was due to driving by such vehicles on motorways compared to 46% and 22% in GB respectively. The proportion of consumption by HGVs on A roads and minor roads is much higher in Northern Ireland. This is particularly the case for HGVs on minor roads (34% in NI) compared to just 10% in GB.

149 See pages 35-38 of the BEIS methodology booklet for more details on these datasets ([Subnational Consumption Statistics: methodology and guidance, Gov.uk website](#)).

150 Data is available on a comparable basis from 2005 onwards.

151 Taken from Road Lengths in Great Britain: 2019 ([Road Lengths in Great Britain 2019, Gov.uk website](#)).

152 Taken from Table 1.1 of Northern Ireland Transport Statistics 2018-19 ([Northern Ireland Transport Statistics 2018-2019, Department for Infrastructure website](#)).



Table 5.8 Northern Ireland Road Transport Energy Consumption (Tonnes of Oil Equivalent), 2009 to 2019

	Personal													Freight							
	Buses								Petrol Cars & Motorcycles ¹⁵³					HGV				Diesel and Petrol LGV ¹⁵⁴			
	Motorways	A roads	Minor roads	Total	Motorways	A roads	Minor roads	Total	Motorways	Motorways	A roads	Minor roads	Total	Motorways	A roads	Minor roads	Total	Motorways	A roads	Minor roads	Total
2009	2,344	11,484	2,859	16,687	39,986	217,008	215,468	215,468	472,462	45,634	257,212	232,322	535,168	22,189	123,409	69,112	214,710	6,504	41,065	32,537	80,106
2010	2,351	11,468	1,858	15,678	40,769	221,360	213,053	213,053	475,181	43,623	245,935	221,532	511,090	22,336	124,347	66,274	212,957	6,502	41,047	28,974	76,524
2011	2,373	11,525	3,974	17,872	41,536	225,647	208,802	208,802	475,986	42,158	237,629	214,662	494,448	22,495	125,168	53,791	201,454	6,473	41,111	29,250	76,833
2012	2,411	11,648	3,405	17,464	42,399	230,417	204,592	204,592	477,409	40,525	228,369	208,195	477,089	22,854	127,259	47,669	197,783	6,409	41,177	28,615	76,201
2013	2,408	11,585	3,540	17,533	41,548	225,812	204,580	204,580	471,940	39,914	224,910	206,769	471,594	22,821	127,058	50,466	200,345	6,228	40,519	30,406	77,152
2014	2,402	11,523	3,554	17,479	42,700	232,020	215,716	215,716	490,435	37,468	211,115	192,749	441,332	22,781	126,900	56,708	206,390	6,050	39,886	31,392	77,328
2015	2,436	11,650	3,538	17,624	43,340	235,429	211,987	211,987	490,756	35,933	202,531	182,878	421,342	23,063	128,226	50,434	201,723	5,964	39,845	24,165	69,974
2016	2,441	11,641	3,460	17,541	43,535	236,331	218,086	218,086	497,951	34,487	194,382	175,849	404,718	23,158	129,036	60,311	212,506	5,840	39,494	25,223	70,557
2017	2,448	11,786	3,508	17,741	43,774	238,587	219,993	219,993	502,354	33,235	188,401	168,882	390,518	23,294	131,312	54,108	208,713	5,739	39,435	25,038	70,212
2018	2,416	11,639	3,575	17,630	42,919	231,860	230,633	230,633	505,412	32,583	183,539	166,554	382,677	22,944	128,341	68,311	219,596	5,570	38,312	26,312	70,195
2019	2,380	11,417	3,641	17,438	41,789	227,407	237,229	237,229	506,426	30,418	172,834	154,050	357,302	22,674	127,668	79,009	229,351	5,391	37,678	26,952	70,021
NI % 2019	14%	65%	21%	100%	8%	45%	47%	47%	100%	9%	48%	43%	100%	10%	56%	34%	100%	8%	54%	38%	100%
GB % 2019	7%	40%	53%	100%	22%	39%	39%	39%	100%	15%	43%	42%	100%	46%	44%	10%	100%	22%	39%	40%	100%

	Total			% of Total		
	Personal	Freight	Total	Personal	Freight	Total
2009	1,024,317	294,816	1,319,133	78%	22%	100%
2010	1,001,949	289,481	1,291,430	78%	22%	100%
2011	988,306	278,287	1,266,594	78%	22%	100%
2012	971,961	273,984	1,245,946	78%	22%	100%
2013	961,066	277,497	1,238,564	78%	22%	100%
2014	949,245	283,719	1,232,964	77%	23%	100%
2015	929,722	271,697	1,201,419	77%	23%	100%
2016	920,211	283,063	1,203,274	76%	24%	100%
2017	910,613	278,925	1,189,538	77%	23%	100%
2018	905,719	289,790	1,195,509	76%	24%	100%
2019	881,165	299,373	1,180,538	75%	25%	100%
GB 2019	24,489,817	13,536,865	38,026,681	64%	36%	100%

Source: BEIS ([Road transport energy consumption at regional and local authority level, 2005-2019, Gov.uk website](#))

153 Petrol cars account for over 99% of consumption in this category.

154 Diesel LGV accounts for over 99% of consumption in this category. LGVs can be used for a number of tasks (carrying freight, transport or for private use) so not all LGV traffic is related to freight transport.



Sub-National Road Transport Energy Consumption

BEIS also publish road transport consumption data for the 11 council areas in Northern Ireland and data for the most recent year (2019) is shown in Table 5.9 overleaf.

The council area with the highest total consumption (and also for both personal and freight consumption) is Armagh City, Banbridge & Craigavon with consumption at about 163,700 tonnes or 14% of the total. The three biggest consuming District Councils (Armagh City, Banbridge & Craigavon, Newry, Mourne & Down and Mid Ulster) together accounted for over one third (37%) of total Northern Ireland petrol and diesel consumption for road transport use in 2019.

Buses

Consumption of diesel¹⁵⁵ by buses was highest in the Armagh City, Banbridge & Craigavon council area with over 2,000 tonnes of oil equivalent also used in two other council areas: Belfast and Newry, Mourne & Down. Together, these three council areas accounted for over two-fifths (41%) of diesel consumption by buses in Northern Ireland in 2019, with Armagh City, Banbridge & Craigavon on its own accounting for over 15% 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 over 13% of total Northern Ireland consumption in 2019. 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 (12%), Mid Ulster (11%), Fermanagh & Omagh (10%) and Causeway Coast & Glens (10%). Together these five council areas account for over half (56%) 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 15% or over 35,000 tonnes of oil equivalent), followed by Newry, Mourne & Down (12% or just under 26,800 tonnes of oil equivalent), with these two councils together accounting for over one quarter (27%) of HGV diesel use in Northern Ireland in 2019.

Consumption by Use

Overall, some three quarters (75%) of all petrol and diesel fuel consumed for road transport purposes in Northern Ireland in 2019 was for personal use with about one quarter (25%) used by freight. At a council level there were similar splits between personal use and freight use across most council areas. However, some differences include Ards & North Down and Belfast council areas with proportions of personal use of 79% and 80% respectively, whilst in Antrim & Newtownabbey council area the percentage of petrol and diesel used for personal use was lower than average, at 72%. In most council areas though, the personal/freight consumption split was very close to the Northern Ireland average.

155 Petrol cars, motorcycles and petrol LGV are petrol consuming vehicles, while buses, diesel cars, HGV and diesel LGV are diesel consuming vehicles.



Table 5.9 Road Transport Energy Consumption at District Council level (Tonnes of Oil Equivalent), 2019

District Council Area	Personal				Freight			Personal	Freight	Total
	Buses	Diesel Cars	Petrol Cars	Motorcycles	HGV	Diesel LGV	Petrol LGV			
Antrim and Newtownabbey	1,688	40,988	29,024	181	22,593	4,855	42	71,881	27,490	99,372
Ards and North Down	973	26,959	19,452	164	9,137	3,622	33	47,548	12,792	60,341
Armagh City, Banbridge and Craigavon	2,700	68,257	47,634	298	35,187	9,502	83	118,890	44,771	163,661
Belfast	2,029	41,304	31,148	240	15,696	3,464	35	74,720	19,194	93,914
Causeway Coast and Glens	1,441	50,477	34,518	233	20,777	7,005	61	86,669	27,842	114,512
Derry City and Strabane	942	34,918	24,309	163	14,763	4,068	37	60,333	18,867	79,200
Fermanagh and Omagh	1,299	51,831	35,080	224	23,491	6,590	58	88,433	30,139	118,572
Lisburn and Castlereagh	1,333	40,030	28,590	172	19,458	5,730	50	70,125	25,239	95,365
Mid and East Antrim	1,034	37,232	26,130	180	17,400	5,826	52	64,576	23,278	87,854
Mid Ulster	1,635	54,160	36,960	217	24,066	7,521	65	92,972	31,652	124,624
Newry, Mourne and Down	2,363	60,270	42,133	251	26,783	11,229	96	105,017	38,108	143,125
Northern Ireland	17,438	506,426	354,979	2,323	229,351	69,411	611	881,165	299,373	1,180,538

Source: BEIS ([Road transport energy consumption at regional and local authority level, 2005-2019, Gov.uk website](#))

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.



Total Energy Consumption for Northern Ireland

The following table provides information on total energy consumption¹⁵⁶ in Northern Ireland using the BEIS total final energy consumption data.

Table 5.10 Total Energy Consumption in Northern Ireland (GWh), 2015 – 2019

	2015	2016	2017	2018	2019
Petroleum Products	29,529	29,986	29,450	29,816	28,833
Electricity	7,637	7,630	7,706	7,607	7,472
Gas	5,924	5,827	6,562	6,273	7,074
Bio-energy & Wastes	3,735	4,340	5,363	6,404	6,698
Coal	3,149	3,023	2,578	2,288	2,045
Manufactured Fuels	388	344	373	376	354
Total Energy Consumption in Northern Ireland	50,362	51,151	52,033	52,764	52,476
Total Energy Consumption in GB ¹⁵⁷	1,461,713	1,454,076	1,476,826	1,483,930	1,466,484
NI as a % of GB	3.4%	3.5%	3.5%	3.6%	3.6%

Source: BEIS ([Sub-national total final energy consumption data, Gov.uk website](#))

Table 5.10 shows that some 52,476 GWh of energy was consumed in Northern Ireland in 2019. This was equivalent to 3.6% of the total energy consumption in GB for the same year.

Over the period 2015-2019, total energy consumption increased by 4%. Consumption was highest in 2018 in Northern Ireland though overall consumption has been fairly steady over the period and annual changes were around 2% or less over the period shown. Total consumption in GB has also been fairly stable and annual changes were also 2% or less over the period shown. Northern Ireland energy consumption as a proportion of GB consumption has been steady (at around 3.5%) in each year 2015 to 2019.

The table shows some much larger changes in individual fuels over the period. For example, consumption of Bioenergy & Wastes increased by nearly 80% over the period shown and there was a 19% rise in gas consumption over the same period. These rises have more than offset the 35% fall in coal consumption and 2% falls in both petroleum products and electricity consumption over the period.

156 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.

157 Full spreadsheets available at [Sub-national total final energy consumption data, Gov.uk website](#). GB total includes a small amount of unallocated consumption (i.e. consumption that could not be allocated to any particular UK region).



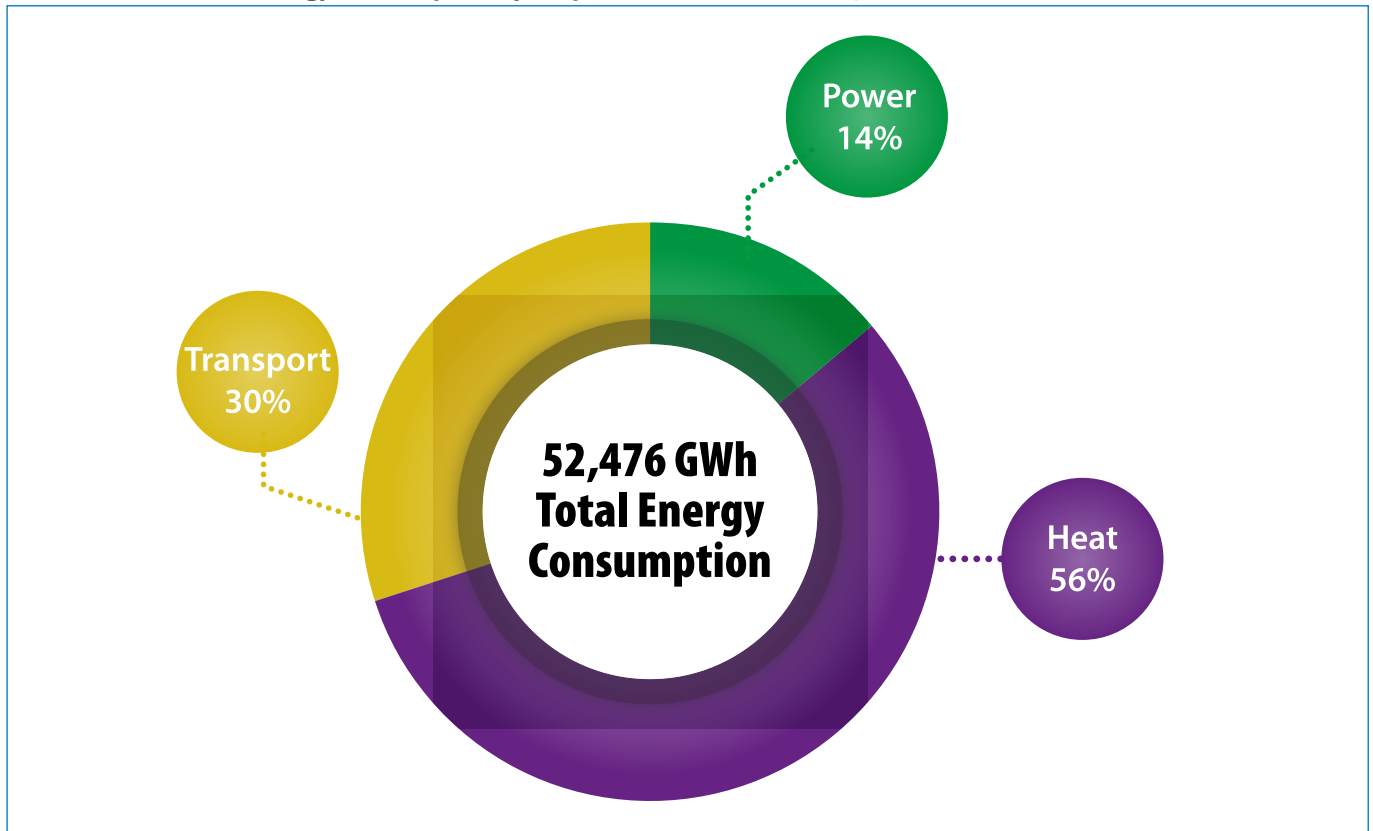
Total Energy Consumption by Purpose for Northern Ireland

The following chart is an attempt to present the final energy consumption data in Table 5.10 above split by the main purpose for/sector consuming the energy: i.e. into Transport, Power (electricity) and Heat sectors.

Splitting the data into these purposes/sectors is not straightforward and the chart below is an approximation. As an example, while it is reasonable to assume that all petroleum product use for ‘road transport’ or ‘rail’ can be assigned to the ‘Transport’ sector it is less clear for assigning other volumes. Electricity consumption in the ‘domestic’ sector, for example, could probably mostly be categorised as ‘Power’: however some domestic electricity consumption will be consumed as ‘Heat’ (e.g. Economy 7 heating or air conditioning) and indeed some for ‘Transport’ (charging electric vehicles). This would be the same for Industrial & Commercial electricity consumption.

As the exact split for each type of energy consumed by purpose/sector is not known, they have been assigned to one sector based on where it is assumed the majority of consumption takes place. The table in Annex 5.2 details how each component of energy consumption has been assigned to one of the three purposes/sectors: Transport, Heat or Power.

Chart 5.2 Total Final Energy Consumption by Purpose in Northern Ireland, 2019



Source: BEIS ([Sub-national total final energy consumption data, Gov.uk website](#))

As the chart above shows, of all energy consumption in Northern Ireland in 2019 over half (56% or about 29,260 GWh) was for the purposes of Heat (this includes consumption of kerosene for domestic and non-domestic heating plus all natural gas consumption and all coal consumption by domestic and non-domestic). Almost another third (30% or some 15,740 GWh) of all energy consumed was for Transport purposes (i.e. petrol and diesel consumption for road and rail) and the remaining 14% (or around 7,470 GWh) was accounted for by electricity consumption (i.e. Power).



Annex 5.1 Map of Transmission Gas Pipelines



Source: NI Gas Market Operator ([NI Gas capacity statement](#), [NI Gas Market Operator website](#))



Annex 5.2 Assignment of Energy Consumption to Power, Heat or Transport Purpose/Sector

	2019 Consumption (GWh)	Power, Heat or Transport
<u>Coal</u>		
Industrial & Commercial	1,581.7	Heat
Domestic	435.0	Heat
Rail	0.1	Transport
Public Sector	28.0	Heat
Total Coal	2,044.7	>99% Heat
<u>Manufactured fuels</u>		
Industrial	34.5	Heat
Domestic	319.7	Heat
Total Manufactured Fuels	354.2	100% Heat
<u>Petroleum products</u>		
Industrial & Commercial	6,225.5	Heat
Domestic	7,400.4	Heat
Road transport	13,111.4	Transport
Rail	137.2	Transport
Public Sector	81.8	Heat
Agriculture	1,876.7	Transport
Total Petroleum Products	28,832.9	47.5% Heat, 52.5% Transport
<u>Gas</u>		
Industrial & Commercial	4,067.7	Heat
Domestic	3,006.1	Heat
Total Gas	7,073.8	100 % Heat
<u>Electricity</u>		
Industrial & Commercial	4,575.0	Power
Domestic	2,897.4	Power
Total Electricity	7,472.4	100% Power
<u>Bioenergy & wastes</u>		
Industrial & Commercial	4,210.1	Heat
Domestic	1,869.6	Heat
Road transport	618.3	Transport
Total	6,698.0	>90% Heat
<u>ALL FUELS</u>		
TOTAL	52,476.0	56% HEAT, 30% TRANSPORT, 14% POWER

Chapter 6:
Energy and the Consumer



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 18.4% higher in the period 2018-2020 than the UK average. However, this gap was smaller compared to five years previously (33% in the period 2013-2015).
- Weekly household expenditure on electricity was the joint third highest in Northern Ireland in the period 2018-2020, only 4% higher than the UK average but 21% above the UK region with the lowest expenditure. However, this is the first time weekly expenditure on electricity in Northern Ireland has been lower than any other region.
- Weekly expenditure on gas in Northern Ireland was around two-fifths of the UK average expenditure but households in Northern Ireland spent over seven times as much per week on other fuels (e.g. home heating oil) compared to the UK as a whole in the period 2018-2020.
- In 2021, for domestic electricity customers, Northern Ireland had the lowest unit cost of all UK regions with these being some 9% below the UK average.
- Domestic electricity prices for Northern Ireland in January-June 2019 were 8% below the EU average (median) figure and lower than 8 of the 14 EU countries.
- For the period January-June 2021, domestic gas prices in Northern Ireland were over 34% lower than the EU median price and only the UK had a lower tariff.

Non-Domestic Expenditure on Energy

- In the period January-June 2021, Northern Ireland non-domestic electricity prices were around 2% higher than the UK in the very small category and 6% higher in the small category. However, they were 7% lower in the small/medium category, 11% lower in the medium category and around 18% lower than the UK in the large/very large category.
- Northern Ireland non-domestic electricity prices were above the EU median price in all categories. In the very small category NI prices were 10% above the EU median. Northern Ireland prices were substantially above the EU median price in the small category (29% higher), small/medium category (39% higher), the medium category (36% higher) and in the large/very large category (58% higher) over the period January-June 2021.

Road Fuel Prices

- Diesel and petrol prices in Northern Ireland in March 2022 were the highest per litre prices on record. The largest monthly price increases on record in petrol and diesel in Northern Ireland occurred between February 2022 and March 2022.



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. It is important to note that consumer expenditure on goods and services is related to, but different from, the prices of consumer goods and services. For example, with a fixed price for a good/service, expenditure will differ between consumers depending on how much of the good/service they purchase. Whilst pricing of a good/service, for example, could be constant on a National basis, regional variation in demand for goods/services will be one of the main factors underpinning regional variations in expenditure. This distinction between prices and expenditure becomes more complicated when there are regional differences in both prices for goods and services and regional differences in consumer demand. This complexity applies to statistics and information on energy consumption, prices and expenditure.

Household Expenditure on Energy

The Living Costs and Food Survey published by the Office for National Statistics (ONS) 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 (£), 2018-2020¹⁵⁸

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	10.40	10.60	0.90	22.00	499.30	4.4%
North West	12.00	11.40	0.50	23.90	530.00	4.5%
Yorkshire & the Humber	10.80	10.10	0.80	21.70	529.90	4.1%
East Midlands	12.00	10.30	1.20	23.50	567.00	4.1%
West Midlands	11.90	10.80	1.10	23.80	525.20	4.5%
East	12.30	9.80	2.10	24.10	607.70	4.0%
London	11.90	11.10	0.10	23.10	703.10	3.3%
South East	12.60	11.10	1.30	25.00	698.60	3.6%
South West	12.90	8.60	2.70	24.20	616.60	3.9%
England	12.00	10.50	1.20	23.60	600.50	3.9%
Wales	11.80	9.60	2.80	24.20	513.00	4.7%
Scotland	12.80	10.00	1.80	24.60	512.40	4.8%
Northern Ireland	12.60	4.00	11.70	28.30	486.40	5.8%
United Kingdom	12.10	10.20	1.60	23.90	585.20	4.1%

Source: ONS Living Costs and Food Survey ([Family spending workbook 3: expenditure by region, Office for National Statistics website](#))

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 18.4% higher (at £28.30 per week in the period 2018-20) compared to the UK average of £23.90. This difference is likely to be driven by a combination of factors including: energy mix and the dependence on home heating oil in Northern Ireland; geographic and weather conditions with Northern Ireland being one of the windier parts of the UK; energy pricing; and lower household income levels. In particular, it is worth noting that the total weekly expenditure in Northern Ireland on all commodities and services is the lowest regionally, reflecting lower household incomes and earnings. On that basis alone, household expenditure on energy (an essential) as a proportion of all weekly expenditure in Northern Ireland, will be pushed higher.

¹⁵⁸ Figures cover the period financial year ending 2018 to financial year ending 2020. Figures may not sum due to rounding.



Weekly household expenditure on electricity in Northern Ireland was the joint third highest of all regions (at £12.60), 4% higher than the UK average and 21% more than the UK region with the lowest expenditure on electricity (North East). This is the first time weekly expenditure on electricity in Northern Ireland has been lower than any other region.

Compared to 2017-19¹⁵⁹, as shown in the previous Energy in Northern Ireland report¹⁶⁰, all regions spent more on energy in the period 2018-20. The largest proportional rise was seen in Northern Ireland where weekly household expenditure on energy rose by around £1.80 or 7%. Whilst weekly expenditure on energy in Northern Ireland was 5.8% of total weekly expenditure in the period 2018-20, up from 5.4% in 2017-19 and the highest proportion of any region, this proportion has fallen since 2013-15 where it stood at 7.0%¹⁶¹. For comparison, the UK proportion was 4.9% in 2013-15 and, as Table 6.1 shows, this has fallen to 4.1% for 2018-20 (though up slightly from 4.0% in 2017-19).

Expenditure on Gas and 'Other fuels' in Northern Ireland is very different from any other region of the UK and this has been the case for some time. For example, in 2018-20, weekly spending on gas in NI (£4.00) was around two-fifths (39.2%) of the UK average weekly expenditure (£10.20) while households in Northern Ireland spent over 7 times as much per week on other fuels (£11.70) compared to the UK as a whole (£1.60).

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. The Department for Business, Energy & Industrial Strategy (BEIS) undertake a quarterly survey (Public Attitudes Tracker¹⁶²) which shows that some 87% of UK households surveyed in September 2020 reported that gas heating was the main way they heated their property during winter with only 4% reporting oil central heating as the main way. The BEIS survey also provides some regional breakdowns and, for Northern Ireland, some 45% of households surveyed in September 2020 reported that gas heating was the main way they heated their property during winter with 46% reporting oil central heating as the main way. These results are based on a fairly small number of NI households on the survey (around 160) but very much highlight the differences in home heating sources between regions.

Information from the Northern Ireland Housing Executive's House Conditions Survey¹⁶³ (which covered some 3,000 NI dwellings) showed that, for 2016, around 24% of dwellings 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. It is worth noting that the proportion of dwellings in Northern Ireland with gas central heating was 4% in 2001 and 17% in 2011, so the proportion has been rising. The Belfast Metropolitan Area (BMA) accounted for almost half of all dwellings that use gas for central heating in Northern Ireland. Also, over three-fifths (around 89,500 or 62%) of all dwellings in the BMA had gas central heating. The vast majority (98%) of all gas-heated dwellings in 2016 were located in urban areas reflecting the extent of the gas network then. Note that the 2021 House Conditions Survey was postponed for a year due to Covid-19. Plans are underway for the survey to be completed in 2022. Therefore, results relating to 2016 remain the most up-to-date available. Results to be released from the 2021 Census will provide robust data on central heating type for Northern Ireland households with publication of this data expected in Winter 2022/23¹⁶⁴.

159 Figures for the period financial year ending 2017 to financial year ending 2019.

160 See page 104 in [Energy in Northern Ireland 2020, DfE website](#).

161 Taken from data available at [Detailed household expenditure by countries and regions: Table A35, ONS website](#).

162 Data from Wave 32 undertaken in December 2019 available at [BEIS Public Attitudes Tracker: Wave 35, Gov.uk website](#).

163 See Table 7.4 of Main Data Tables at [House Condition Survey, Northern Ireland Housing Executive website](#).

164 See [Census 2021 outputs prospectus, Northern Ireland Statistics and Research Agency website](#).



Household expenditure data for Ireland shows a spending profile on energy that is more closely aligned with that in Northern Ireland although gas central heating is more prevalent in Ireland than in Northern Ireland (around 35% of households in Ireland in 2016 had gas¹⁶⁵ 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 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 Ireland, at 66%, is similar to the overall proportion for Northern Ireland.

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 ¹⁶⁶ :			Proportion of households with central heating that is ¹⁶⁷ :		
	Electricity	Gas	Other fuels	Oil	Gas	Other
Northern Ireland	45%	14%	41%	68%	24%	8%
UK	51%	43%	7%	4%	85%	11%
Ireland	46%	21%	33%	41%	35%	24%

Sources: ONS¹⁶⁸, CSO^{169 170}, NIHE¹⁷¹, BEIS¹⁷²

In terms of weekly expenditure, Table 6.2 above shows that only 14% of weekly energy expenditure in Northern Ireland was on gas, compared to some 43% for the UK as a whole. Over two-fifths (41%) of all weekly energy expenditure in Northern Ireland was on 'other fuels' mainly home heating oil, coal etc., compared to only 7% for the UK as a whole. In Ireland, one third (33%) of all weekly energy expenditure was on 'other fuels', lower than the equivalent proportion for Northern Ireland but almost five times that for the UK as a whole. Similarly, expenditure on gas accounted for 21% of all weekly energy spend in the Republic of Ireland, higher than the proportion for Northern Ireland (14%) but less than half the proportion for the UK.

Recent additional analyses of the Living Costs and Food Survey data has focused on expenditure on energy by households in Northern Ireland in the context of all household expenditure¹⁷³. Additional research estimated the impacts of increased energy prices and energy expenditure on household budgets illustrating the scale and characteristics of the relatively higher levels of vulnerability of households in Northern Ireland to energy cost increases¹⁷⁴.

The remaining sections in this chapter look at energy prices data with the latest data available used in each case. Most of the energy prices data refers to the position in 2021 and therefore will not reflect the outcome of the international crisis that emerged in March 2022 and the resulting impact on energy supply and prices.

165 This includes natural gas and LPG gas.

166 The most recent data on average weekly household expenditure for the Republic of Ireland refers to 2015-16. The most recent data for NI and UK refers to the period 2018-2020.

167 This data refers to 2016 for all countries.

168 NI and UK weekly energy expenditure data is from the Office for National Statistics' Living Costs and Food Survey available at [Detailed household expenditure by countries and regions: Table A35, ONS website](#).

169 Republic of Ireland weekly energy expenditure data is from Central Statistics Office's Household Budget Survey available at [Central Statistics Office website](#).

170 Proportion of households with central heating data for the Republic of Ireland is taken from the 2016 Census, available on the Central Statistics Office's website - see report [Census, Central Statistics Office website](#) and data tables [Data, Central Statistics Office website](#).

171 Proportion of households with central heating data for Northern Ireland is taken from the Northern Ireland Housing Executive's House Condition Survey - see Table 7.4 of Main Data Tables in [House Condition Survey, Northern Ireland Housing Executive website](#).

172 Proportion of households with central heating data for the UK is taken from the Department for Business, Energy & Industrial Strategy's Public Attitudes Tracker Survey Wave 18 undertaken in June 2016. Data is available from summary tables spreadsheet at [Public Attitudes Tracking Survey: Wave 18, Gov.uk website](#).

173 See [Northern Ireland household domestic energy expenditure 2013-15 to 2018-20, DfE website](#).

174 See [Northern Ireland household energy expenditure: income differences and non-discretionary impacts, DfE website](#).



Electricity Prices – Domestic Customers

The electricity markets across the UK and the Devolved Regions within the UK are complex and fluid and arriving at comparable price and billing estimates represents a challenging exercise. BEIS produce a standardised measure of regional electricity bills based on the average unit costs of suppliers across a range of payment methods. Importantly, the estimated bill is based on a standardised domestic consumption figure of 3,600kWh/year¹⁷⁵. We know that average domestic electricity consumption within Northern Ireland varies by District Council area from around 3,000 kWh in Belfast to 4,300 kWh in Mid Ulster (Table 3.1 Chapter 3) which indicates the extent to which an average consumption figure of 3,600 kWh may differ from actual consumption at different geographies. On that basis, whilst the regional unit cost of electricity may provide an indication of price differentials across the UK, the estimated average bill, based on a standardised domestic consumption figure of 3,600 kWh, is unlikely to entirely reflect regional variation in electricity consumption.

The table below shows that in 2021, for domestic customers, Northern Ireland had the lowest average unit cost and, consequently (based on calculating annual bills on an annual consumption figure of 3,600kWh/year), the lowest average annual electricity bill of all 15 UK regions for Credit, Direct Debit and Prepayment customers and the lowest overall unit costs of any UK region.

Northern Ireland has had the lowest (or one of the lowest) unit costs of any region since around 2016. This is, however, a significant change to previous years. In 2014, for example, Northern Ireland had the highest unit costs for Credit and Direct Debit customers, the second highest unit costs for Prepayment customers and the highest overall unit costs of any UK region¹⁷⁶.

175 In December 2019, BEIS proposed new consumption levels of 3,600 kWh per year for standard electricity. Prior to that, 3,800 kWh per year was used.

176 See data at [Annual domestic energy bills, Gov.uk website](#).



Table 6.3: Average Annual Domestic Electricity Costs for UK Regions based on Consumption of 3,600kWh/year: Unit cost (Pence per kWh), Bill (£) and Rank, 2021

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	22.27	802	14	20.41	735	14	20.76	747	11	20.75	747	14
Eastern	22.95	826	6	21.02	757	6	21.45	772	7	21.39	770	7
London	22.79	820	8	20.98	755	7	21.53	775	6	21.55	776	6
Merseyside & North Wales	24.07	866	1	22.04	794	1	22.46	809	1	22.41	807	1
North East	22.48	809	11	20.62	742	11	20.41	735	14	20.86	751	12
North Scotland	23.39	842	5	21.67	780	3	21.97	791	3	22.02	793	3
North West	22.40	806	13	20.45	736	13	20.60	742	13	20.78	748	13
Northern Ireland	19.64	707	15	19.37	697	15	19.41	699	15	19.43	699	15
South East	23.55	848	3	21.58	777	4	21.91	789	4	21.92	789	4
South Scotland	22.44	808	12	20.74	747	10	20.84	750	10	21.03	757	10
South Wales	23.50	846	4	21.52	775	5	21.58	777	5	21.85	787	5
South West	23.66	852	2	21.78	784	2	22.18	799	2	22.11	796	2
Southern	22.77	820	9	20.86	751	8	21.16	762	9	21.18	762	9
West Midlands	22.80	821	7	20.84	750	9	21.21	764	8	21.21	763	8
Yorkshire	22.50	810	10	20.51	738	12	20.71	746	12	20.87	751	11
UK	22.77	820	-	20.94	754	-	21.13	761	-	21.27	766	-

Source: BEIS ([Annual domestic energy bills, Gov.uk website](#))¹⁷⁷

Overall (i.e. taking into account all three payment methods) Northern Ireland had the lowest unit cost and annual bill, with these being some 9% below the UK average and over 13% below the region with the highest unit cost and annual bill (i.e. Merseyside & North Wales). The overall annual average bill, based on consumption of 3,600kWh/year, for domestic customers in Northern Ireland is over £107 lower than in the most expensive UK region and over £66 below the UK average.

In the past, electricity prices in Northern Ireland were consistently higher than in GB. Indeed, Northern Ireland had the highest overall unit electricity cost of all UK regions each year from 2008 to 2014 except for 2013 (second highest unit cost). In 2015 NI had the third highest unit cost. 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. However in 2016, and for the first time, overall annual unit costs in Northern Ireland fell below the UK average¹⁷⁸ and indeed were the lowest of any UK region. This trend has continued each year to 2021 where, as noted above, unit costs and average annual bills for Northern Ireland domestic customers were significantly below UK average rates.

177 See Annex 6.1 for notes to this table.

178 As per information on annual domestic electricity bills from BEIS ([Annual domestic energy bills, Gov.uk website](#)).



Table 6.1 earlier showed that Northern Ireland had the joint third highest weekly expenditure on electricity of all UK regions over the period 2018-20, while Table 6.3 showed that unit costs for electricity in 2021 for domestic customers in Northern Ireland were the lowest of all UK regions. These data, whilst from different sources, appear contradictory. If average annual domestic electricity consumption is higher in Northern Ireland than in other regions then this could explain why reported expenditure on electricity is higher even though the unit cost is lower. Whilst there may be issues with direct comparisons of average annual domestic electricity consumption between GB and NI, the data show that average consumption in Northern Ireland in 2020-21 (as shown in Table 3.1 earlier at 3,682 kWh) was actually slightly lower than in GB in 2020 (at 3,748 kWh¹⁷⁹).

As discussed above, whilst the regional unit cost of electricity may provide an indication of price differentials across the UK, the estimated average regional bills produced by BEIS, based on a standardised domestic consumption figure of 3,600 kWh, is unlikely to entirely reflect regional variation in electricity consumption and may instead be driven more by regional differences in unit cost. It is also worth bearing in mind that the Living Costs and Food Survey estimates of regional household weekly expenditure is from a survey sample of households and not a census of the whole population and therefore estimates are subject to sampling variability.

Attempts at understanding and reconciling the messages from these two sources of data is ongoing although the challenges are considerable. A recent exploration¹⁸⁰ of the underpinning issues proved useful in rehearsing and testing the various factors that potentially impact however, ultimately, it did not fully account for the differences between the two sources.

Both sources of data on expenditure and price respectively are inherently different metrics and, ultimately, what may be of more value when considering, is not the inherent differences between them, but rather the trends in each over time.

179 [Subnational Electricity and Gas Consumption Statistics: Regional and Local Authority, Great Britain, 2020. Gov.uk website.](#)

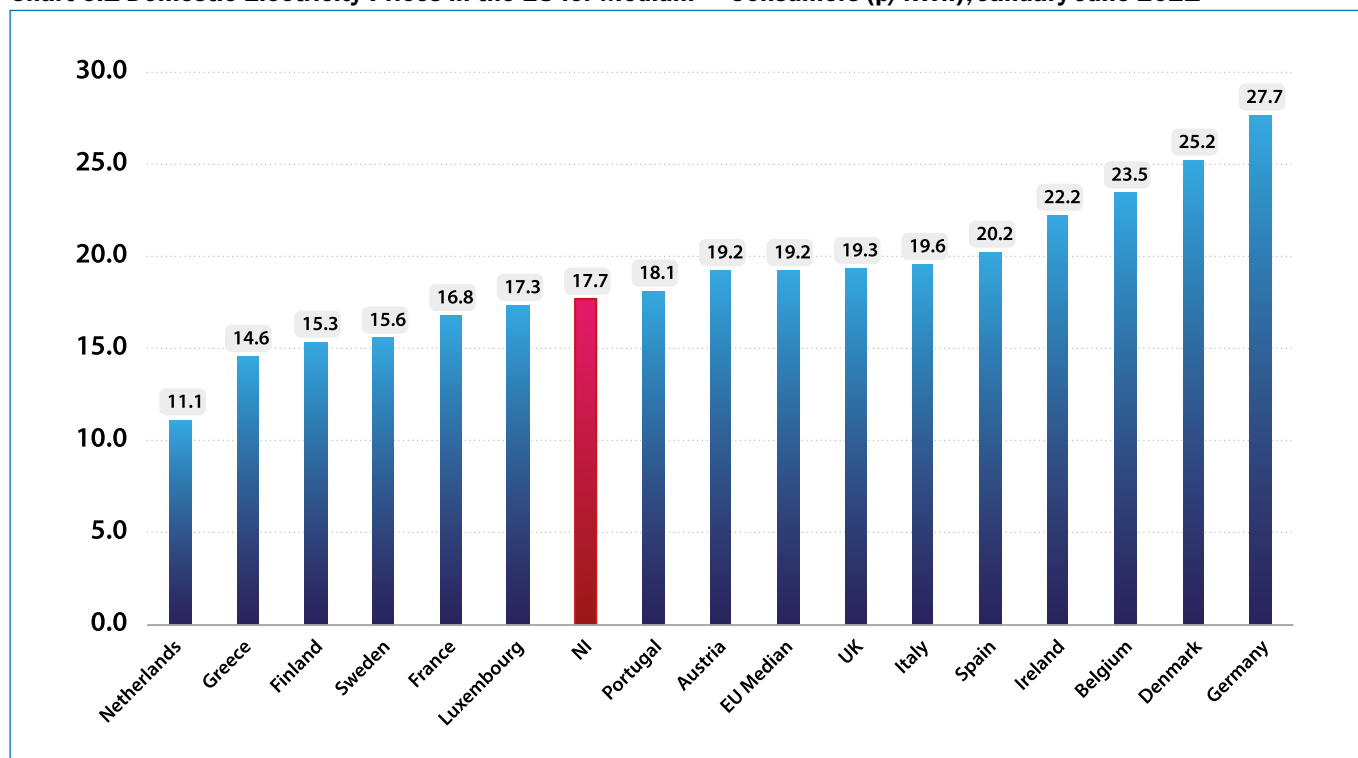
180 Full paper available at [MCC Economics website.](#)



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 price with prices for other EU countries in 2021.

Chart 6.1 Domestic Electricity Prices in the EU for Medium¹⁸¹ Consumers (p/kWh), January-June 2021



Source: BEIS¹⁸² and Utility Regulator for NI¹⁸³

For domestic customers, the Northern Ireland calculated price for the period January to June 2021 was 17.7 pence per kilowatt hour (p/kWh) including taxes. This was 8% below both the UK figure and EU14 plus UK average (median) figures of 19.3 p/kWh and 19.2 p/kWh respectively, 20% below the Republic of Ireland price and lower than 8 of the 14 EU countries. 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 countries¹⁸⁴.

Electricity Prices – Non-Domestic Customers

The Utility Regulator regularly publishes data on electricity prices for the non-domestic sector¹⁸⁵. These figures are presented in the charts and tables below.

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.

181 Medium sized domestic customers (annual consumption of between 2,500 and 4,999 kWh) is selected for the purpose of analysis as this consumption category reflects the majority of domestic customers in NI. Prices include all taxes to reflect the final prices paid by domestic customers.

182 See Table 5.6.2: Medium consumers (2,500-4,999 kWh) including taxes at [International domestic energy prices, Gov.uk website](https://www.gov.uk/government/collections/international-domestic-energy-prices).

183 See page 15 of Quarterly Retail Energy Market Monitoring Report at [Northern Ireland Utility Regulator website](https://www.ureg.gov.uk/).

184 See pages 92-93 in [Energy in Northern Ireland 2016, DfE website](https://www.dfe.gov.uk/energy-in-northern-ireland-2016).

185 See Quarterly Retail Energy Market Monitoring Reports at [Northern Ireland Utility Regulator website](https://www.ureg.gov.uk/).



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 methodology¹⁸⁶ which means Northern Ireland prices can then be compared to those collected and published by BEIS for the UK and Eurostat for the EU Member States.

Non-Domestic Market Breakdown

The information from the Utility Regulator on non-domestic electricity prices is available for the period January-June 2021 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 accounted for 71.6% of total Industrial & Commercial (I&C) customers at the end of Quarter 2 2021 but only 6.4% of consumption.

Table 6.4: Northern Ireland Non-domestic Market, End of Q2 2021

Size of consumer	Annual Consumption Bands (MWh)	% of I&C customers	% of I&C consumption	I&C connection numbers
Very small	< 20	71.6%	6.4%	53,326
Small	20 - 499	27.1%	32.1%	20,185
Small/Medium	500 - 1,999	1.0%	16.4%	730
Medium	2,000 - 19,999	0.3%	28.5%	235
Large/Very Large	> 20,000	0.03%	16.6%	19

Source: Utility Regulator for NI ([Quarterly Retail Energy Market Monitoring report, Utility Regulator website](#))

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 only 1.3% of all non-domestic customers, but they were responsible for over three-fifths (62%) of non-domestic electricity consumption in Q2 2021. 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.¹⁸⁷

Non-Domestic Electricity Prices

The charts overleaf show industrial and commercial (or non-domestic) electricity prices in the 14 EU countries¹⁸⁸ and for the UK and Northern Ireland by consumption size band for January-June 2021. The charts show non-domestic average unit prices, including Climate Change Levy (CCL)¹⁸⁹ 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.

186 For further details on the methodology used, see pages 17-18 of [Q1 2021 Final, Utility Regulator website](#). It should be noted that the comparability of the derived NI prices to the other Member States can be greatly affected by fluctuations in the Euro GBP exchange rate.

187 Source: The Cost of Doing Business in Northern Ireland (see full report on [DfE website](#)).

188 Some graphs do not include all 14 EU countries due to availability of data from Eurostat or BEIS.

189 The Climate Change Levy (CCL) is a tax on electricity, gas and solid fuels delivered to non-domestic consumers. The rate changes every year. From 1 April 2021, it was 0.775p/kWh for electricity: see [Climate Change Levy rates, Gov.uk website](#).



Comparisons with Other Regions

UK

Chart 6.2 shows that non-domestic electricity prices in Northern Ireland in the period January-June 2021 were above UK prices in the smaller categories and below UK prices in the larger categories. Prices in Northern Ireland were 2% higher in the very small category and 6% higher in the small category. However, Northern Ireland prices were 7% lower than the UK in the small/medium category lower, 11% lower in the medium category and 18% lower in the large/very large category.

EU

Northern Ireland prices in the period January-June 2021 were above the EU median price in all categories and were amongst the most expensive in the EU in all categories. Northern Ireland prices were substantially above the EU median price in the largest consuming sectors: in the small/medium category (39% higher), the medium category (36% higher) and in the large/very large category of non-domestic electricity consumers (58% higher). The previous Energy in Northern Ireland report¹⁹⁰ showed that, for 2019, NI prices were also above the EU average in all categories with similar percentage price differences in two categories (small/medium and medium) but percentage differences have increased in the other three categories.

Ireland

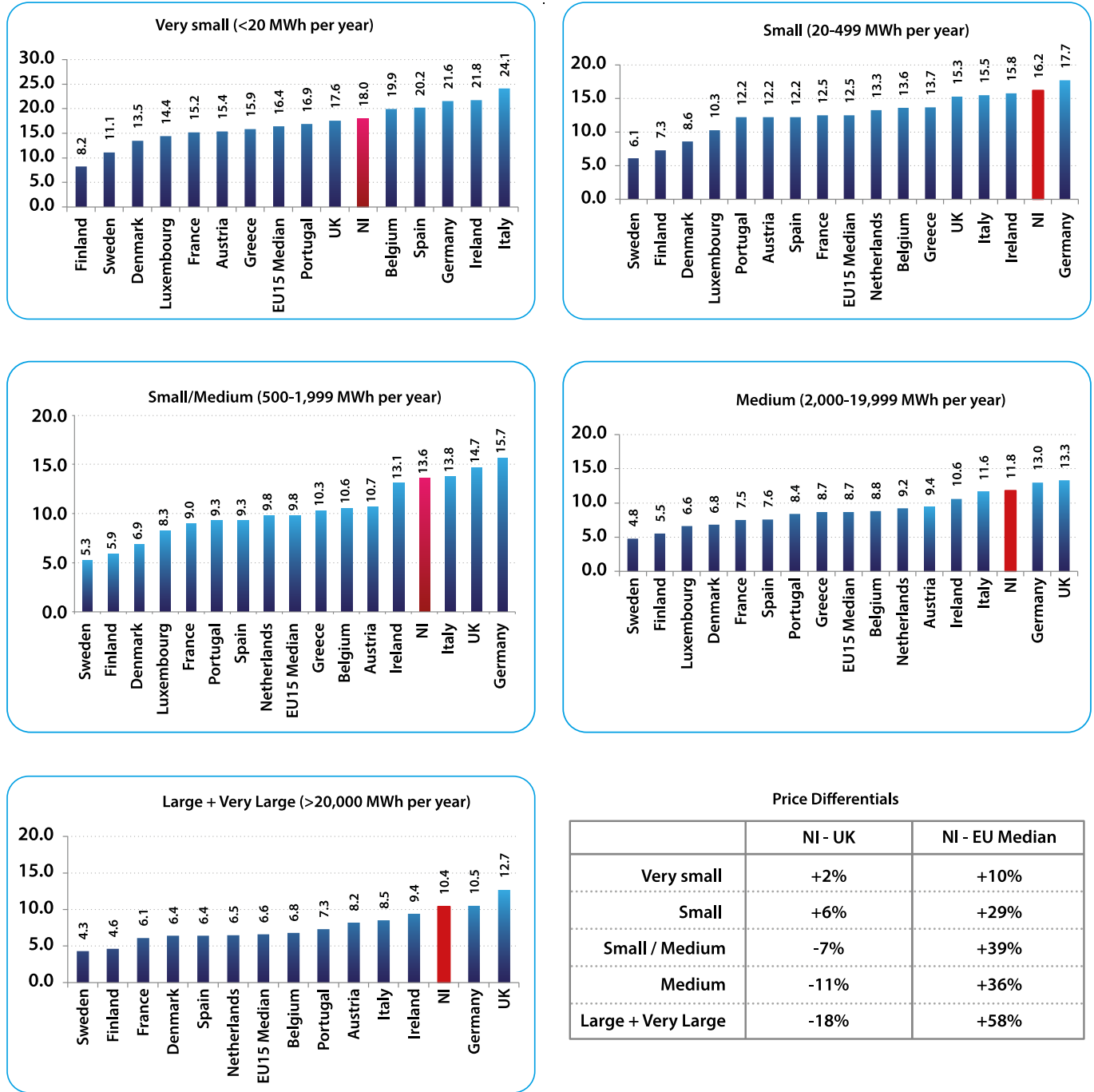
Northern Ireland I&C prices were lower in the period January-June 2021 for the smallest group but higher for all other categories compared to prices in Ireland. NI prices were 17% lower than prices in Ireland in the very small category (Table 6.4 showed that around 72% of I&C customers are in this category) but were 3% higher in the small category (which accounts for another 27% of Northern Ireland I&C customers). Northern Ireland non-domestic electricity prices were above prices in Ireland in the small/medium (+4%), medium (+11%) and large/very large (+11%) groups. The comparative percentage price differences between NI and Ireland has changed little since 2019¹⁹¹.

190 See page 112 of [Energy in Northern Ireland 2020, DfE website](#).

191 See page 111 of [Energy in Northern Ireland 2020, DfE website](#).



Chart 6.2 Non-Domestic Electricity Prices by Consumption Size Band (p/kWh)¹⁹², January-June 2021



Source: Utility Regulator ([Quarterly Retail Energy Market Monitoring report - Q4 2021, Utility Regulator website](#))

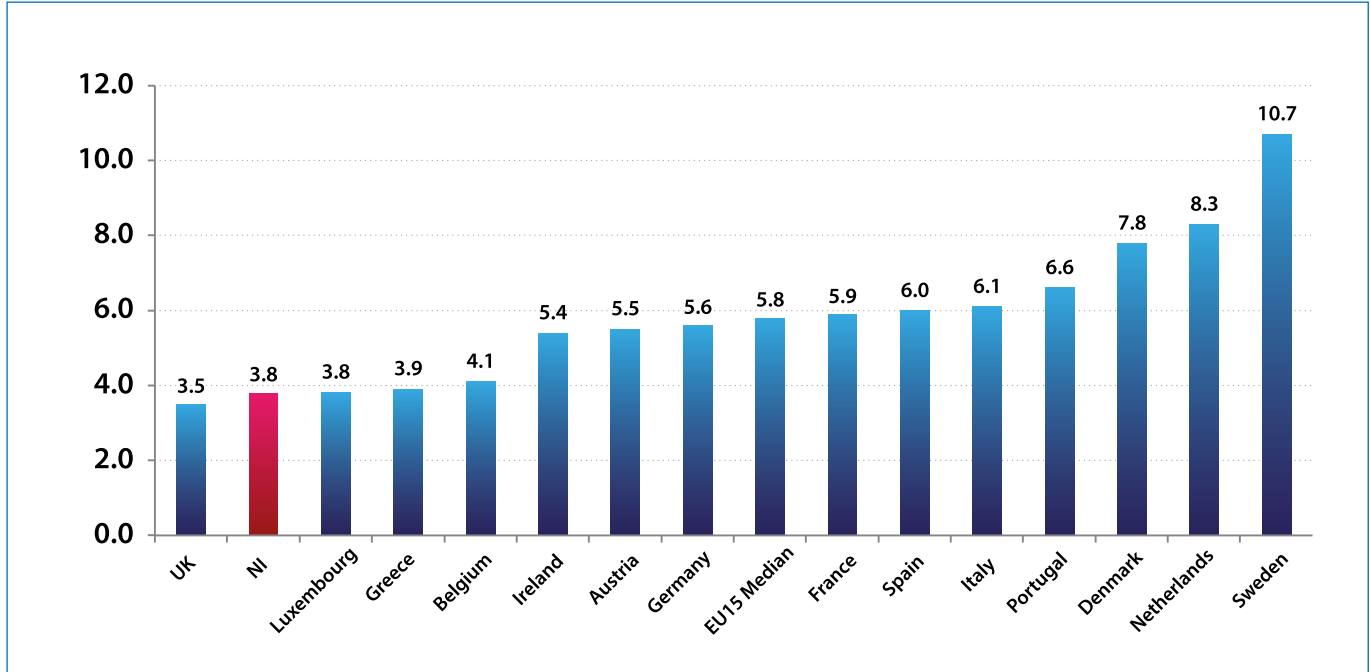
192 All prices are pence per kilowatt hour (p/kWh). Prices exclude VAT but include other taxes



Gas Prices

There is limited information available on gas prices for Northern Ireland. Indeed, BEIS do not publish any gas price data (either domestic or non-domestic) relating to Northern Ireland. However, the Utility Regulator does publish some information on domestic gas prices in Northern Ireland and compares these against other EU countries. This data is replicated in the chart below.

Chart 6.3 Domestic Gas Prices Including Taxes in the EU15 for Medium Consumers (p/kWh), January-June 2021



Source: Utility Regulator ([Quarterly Retail Energy Market Monitoring report - Q4 2021, Utility Regulator website](#))

The NI price shown is the average pence per kWh for medium customers¹⁹³ for the Greater Belfast, Ten Towns and West network areas. Chart 6.3 shows that Northern Ireland domestic gas prices were amongst the lowest in the EU (only the UK had a lower tariff). In the first six months of 2021, average domestic gas prices in Northern Ireland were over 34% or 2.0p/kWh lower than the EU15 median price, around 30% or 1.6p/kWh lower than Ireland but about 9% or 0.3p/kWh higher than the UK.

It should be noted that the tariffs shown for all countries in Chart 6.3 are subject to change as price increases or decreases can be announced by gas providers on a regular basis. Indeed, during the period illustrated in the graph above, there were increases to the regulated tariff within each of the gas network areas (i.e. Ten Towns, Greater Belfast and West areas). Further detail on these regulated tariffs are available on the Utility Regulator website¹⁹⁴.

193 Medium consumers are those with annual consumption between 5,557 -55,557 kWh. This consumption category reflects the majority of domestic customers in NI.

194 See [Briefing paper on SSE Airtricity tariff review April 2021, Utility Regulator website](#) and [Briefing paper on firmus energy tariff review - April 2021, Utility Regulator website](#).



Road Fuel Prices

As shown in Chapter 5 earlier, around 29,000 GWh of petroleum products were consumed in Northern Ireland in 2019, with over 13,000 GWh of this for road transport use (as a comparison and as shown in Chapter 3, total electricity consumption was around 7,700 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 monthly reports¹⁹⁵ on road fuel prices (petrol and diesel) by UK region. Information from the March 2022 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 - Average Mid-Month Prices (Pence per Litre), March 2022

Garages and Supermarkets	Unleaded Petrol (Pence per Litre)	Diesel (Pence per Litre)
Northern Ireland	163.0	173.3
Scotland	162.8	172.4
Wales	162.2	172.8
North East	162.8	172.8
North West	163.8	174.3
Yorkshire & Humberside	163.4	173.8
West Midlands	164.3	173.8
East Midlands	163.5	173.1
Essex & East Anglia	163.6	173.1
London	164.6	174.4
South East	164.7	174.7
South West	163.9	174.4
UK Average	163.8	173.8

Supermarkets	Unleaded Petrol (Pence per Litre)	Diesel (Pence per Litre)
UK Average	158.5	166.3

Source: The AA ([Compare latest petrol and diesel fuel prices. The AA website](#))¹⁹⁶

In March 2022, the average price for unleaded petrol in Northern Ireland was 0.8 ppl lower than the UK average price, the fourth lowest of all UK regions and stood at 163.0 ppl, which is the highest price per litre for unleaded petrol on record for Northern Ireland¹⁹⁷. There was little variation across regions in the price for unleaded petrol. The South East region recorded the highest price for petrol at 164.7 ppl, only 1.7 ppl above the Northern Ireland price and 2.5 ppl above the lowest price in Wales.

The South East region also recorded the highest diesel price at 174.7 ppl in March 2022. Again, there was little variation across the regions. The lowest price was 172.4 ppl in Scotland, only 2.3 ppl below the highest region. Northern Ireland average diesel price in March 2022 was 173.3 ppl, just 0.9 ppl above the lowest UK region and only 0.5 ppl below the UK average. Like unleaded petrol, the March 2022 price for diesel was the highest per litre price for diesel on record for Northern Ireland¹⁹⁸.

195 See [Compare latest petrol and diesel fuel prices. The AA website](#). BEIS also produce data on road fuel prices (see [Road fuel and other petroleum product price statistics, Gov.uk website](#)) 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 about 1% or less. The AA data is used in this compendium to allow for Northern Ireland data to be shown and also to allow for regional comparison.

196 The AA Fuel Price Report uses data sourced from Experian Catalist (see [Experian Catalist website](#)).

197 From AA price data back to January 2006.

198 From AA price data back to January 2006.



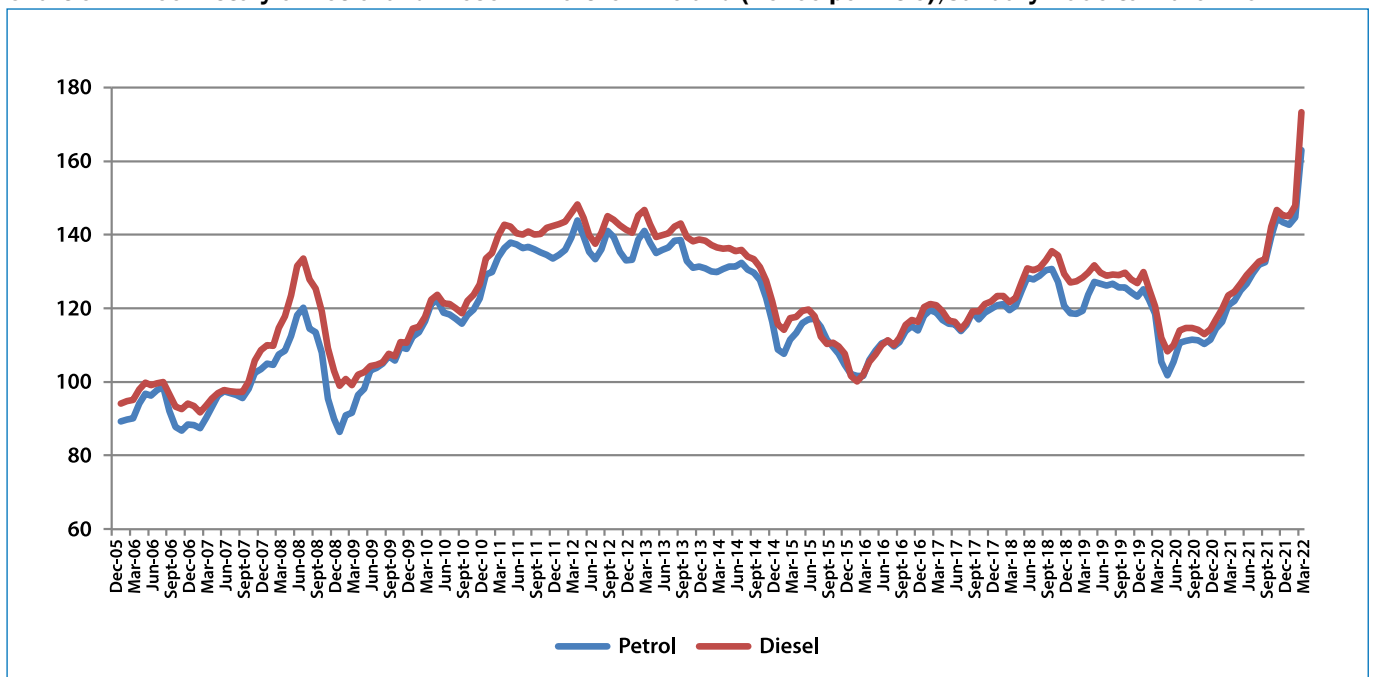
The largest monthly price increases on record in petrol and diesel in Northern Ireland occurred between February 2022 and March 2022 (and similarly for other UK regions) with increases of 18.2 ppl and 25.4 ppl respectively. In February 2022, Northern Ireland had the lowest per litre prices for petrol and diesel and indeed Northern Ireland had the lowest prices for both fuels for some time (back to March 2019). Also, in February 2022 (and for previous months) there was a much larger variation in prices between regions. For example, there was a 4.4 ppl difference in petrol and 4.9 ppl difference in diesel in February 2022 between the highest region (South East) and lowest region (Northern Ireland).

It is also worth noting that the UK average fuel price for both petrol and diesel in supermarket forecourts were around 5p and 7.5p per litre cheaper respectively than the average UK price for all retailers (i.e. supermarkets and garages) and a similar situation likely exists for Northern Ireland.

Price History

The most recent price data for Northern Ireland show that petrol and diesel prices in March 2022 were the highest on record at 163.0 ppl for petrol and 173.3 ppl for diesel. Chart 6.4 details the history of prices for petrol and diesel in Northern Ireland over last 16 years.

Chart 6.4 Price History of Petrol and Diesel in Northern Ireland (Pence per Litre), January 2006 to March 2022



Source: The AA ([Compare latest petrol and diesel fuel prices, The AA website](#))

In general, diesel has historically been more expensive than petrol. On only seven occasions, all of which were in the period August 2015 to June 2016, was the average price of a litre of diesel in Northern Ireland cheaper than petrol. Over the 12 month period April 2008-March 2009, diesel was on average around 12 ppl higher than petrol, with a maximum difference of 13.6 ppl in November 2008. Indeed, over the 16 year period shown, diesel prices were on average 4 ppl higher than petrol (though the average difference was 2 ppl in 2021). As shown in the chart, changes in each fuel price follow a very similar path over time.

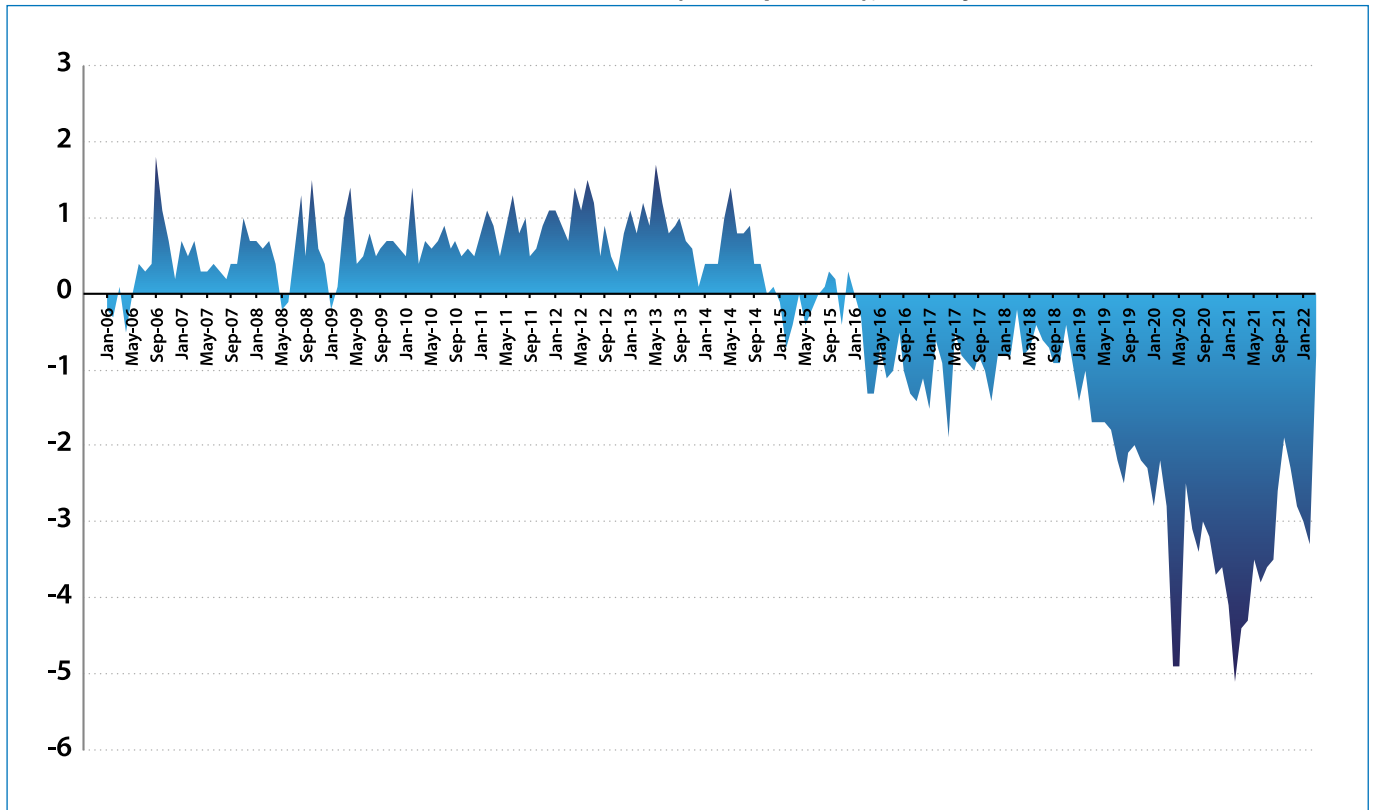
Recent fuel prices have risen significantly with the average cost of a litre of petrol and diesel in March 2022 some 35% and 40% higher respectively than March 2021 prices. Indeed, diesel and petrol prices for Northern Ireland in March 2022 were almost 90% above the lowest price for each fuel in this series (91.7 ppl for diesel in February 2007 and 86.4 ppl for petrol in January 2009).



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 the start of 2016 average prices in Northern Ireland have been below the UK average price for both petrol and diesel. Indeed, the petrol and diesel price in Northern Ireland since January 2016 has been on average 1.9 pence and 2.3 pence per litre respectively below the UK average. However, as noted earlier, price differences were much lower than normal in March 2022: the Northern Ireland price was 0.8 ppl below the UK average for petrol and 0.5 ppl below for diesel. These were the lowest price differentials to the UK average since November 2018 and December 2015 for petrol and diesel respectively. For the previous two years (February 2020 to February 2022), the average price differential to the UK was 3.4 ppl for petrol and 3.9 ppl for diesel.

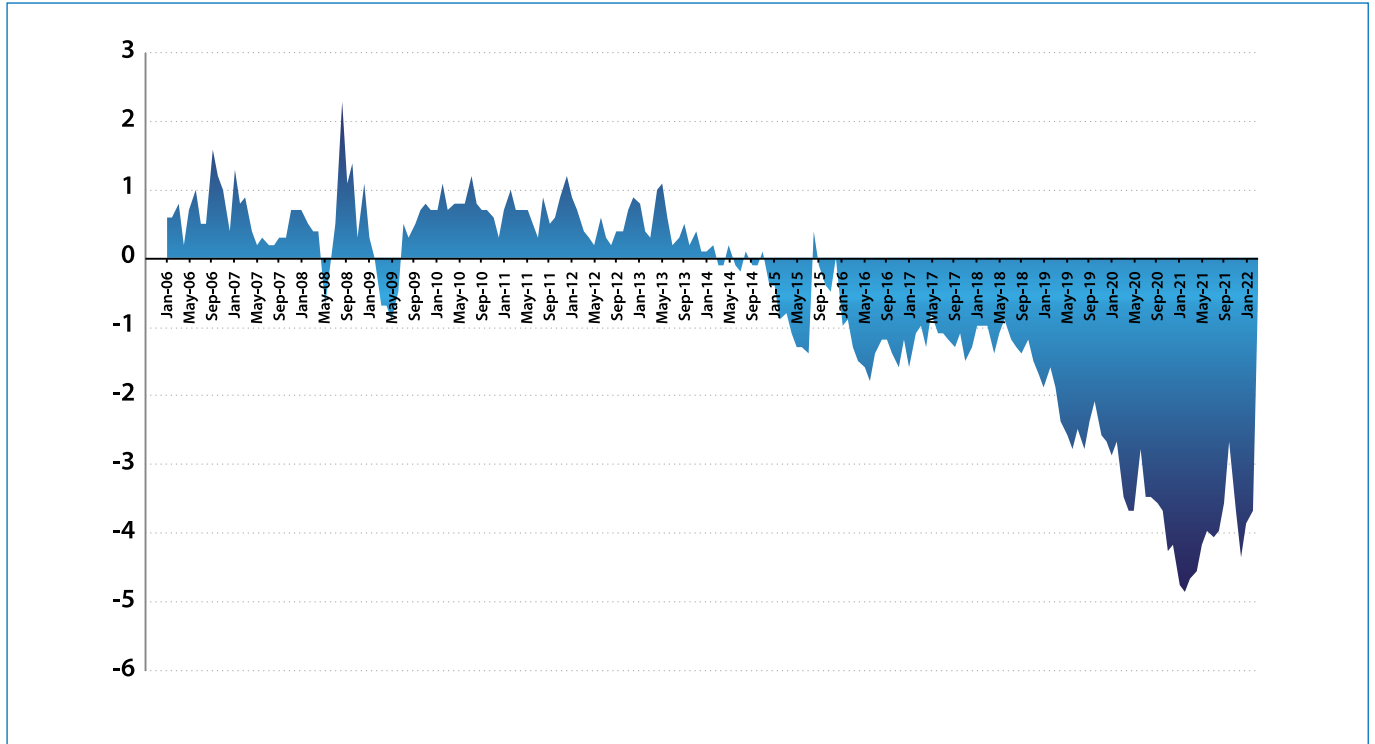
Chart 6.5 Differential in Petrol Prices between NI and UK (Pence per Litre), January 2006 to March 2022



Source: The AA ([Compare latest petrol and diesel fuel prices, The AA website](#))



Chart 6.6 Differential in Diesel Prices between NI and UK (Pence per Litre), January 2006 to March 2022



Source: The AA ([Compare latest petrol and diesel fuel prices. The AA website](#))



Annex 6.1 Notes to Table 6.3

All bills are calculated assuming an annual consumption of 3,600 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.

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.

Further information is available in [Energy Price Variation in the Domestic Energy Market, Gov.uk website](#).