



Scottish & Southern
Electricity Networks

TRANSMISSION

North of Scotland Energy Trends

November 2018



This publication

The Great Britain (GB) energy landscape has undergone significant change in the past decade as decarbonisation and renewable energy targets have driven a rapid growth in renewable energy generation and overall reductions in electricity and gas demand.

This publication sets out SHE Transmission’s analysis of energy trends in the north of Scotland and whether these trends do or do not match the prevailing GB trends.

As the second edition in our series on energy trends in the north of Scotland, this analysis will help shape the topics which we investigate for potential inclusion in our 2019 North of Scotland Future Energy Scenarios publication.

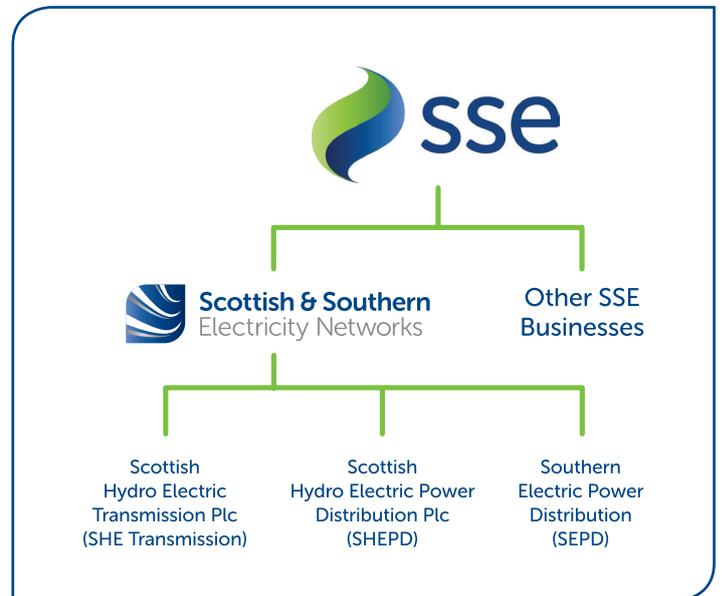
About us

We are Scottish Hydro Electric Transmission (SHE Transmission), part of the SSE Group, responsible for the electricity transmission network in the north of Scotland. We operate under the name of Scottish and Southern Electricity Networks, together with our sister companies, Scottish Hydro Electric Power Distribution (SHEPD) and Southern Electric Power Distribution (SEPD), who operate the lower voltage distribution networks in the north of Scotland and central southern England.

As the Transmission Owner (TO) we maintain and invest in the high voltage 132kV, 275kV and 400kV electricity transmission network in the north of Scotland. Our network consists of underground cables, overhead lines on wooden poles and steel towers, and electricity substations, extending over a quarter of the UK’s land mass crossing some of its most challenging terrain.

We power our communities by providing a safe and reliable supply of electricity.

We do this by taking the electricity from generators and transporting it at high voltages over long distances through our transmission network for distribution to homes and businesses in villages, towns and cities.



Key findings and Recommendations

Our analysis identified the key energy trends across electricity, heat and transport in the north of Scotland:

- Government policy and legislation has been the lead driver in the changes in GB energy generation & demand.
- Onshore wind continues to be the dominant generation technology, representing 57% of the generation capacity present on the network in 2017.
- Fossil fuel plays a small role in the north of Scotland electricity mix, with gas CCGT representing only 7% of generation capacity on our network in 2017.
- The proportion of embedded generation connected to the network has decreased due to several large-scale generation projects coming online and represented 44% of the total generation capacity on the network in 2017.
- Average residential electricity and gas consumption in the north of Scotland has fallen in line with the GB trend, largely due to energy efficiency improvements.
- Average industrial and commercial electricity consumption in the north of Scotland decreased by 24.3% from 2015 to 2016 compared to the 10.4% decrease seen at a GB level.
- From 2015 to 2016, average industrial and commercial gas consumption in the north of Scotland increased by 10.2% which is significantly higher than the 2.1% increase seen at a GB level.
- The total number of electric vehicles in the north of Scotland has increased year-on-year, reaching 1,878 electric vehicles in 2017.
- 73% of local authorities in the north of Scotland had over 100 licenced electric vehicles in their respective areas at the end of 2017.
- Aberdeen City, Aberdeenshire, Dundee City, Perth and Kinross and Highland remain the local authorities with the highest total number of licenced EVs in the north of Scotland.

Our analysis has also identified areas where further analysis and investigation is required. These are summarised below:

- Identify drivers of the reduction in industrial and commercial electricity consumption.
- Identify drivers of the increase in industrial and commercial gas consumption.
- Determine how industrial and commercial activity may change in the future.

Electricity generation

The transmission network in the north of Scotland has continued to see an increase in renewable energy generation driven by UK and Scottish Government policy support.

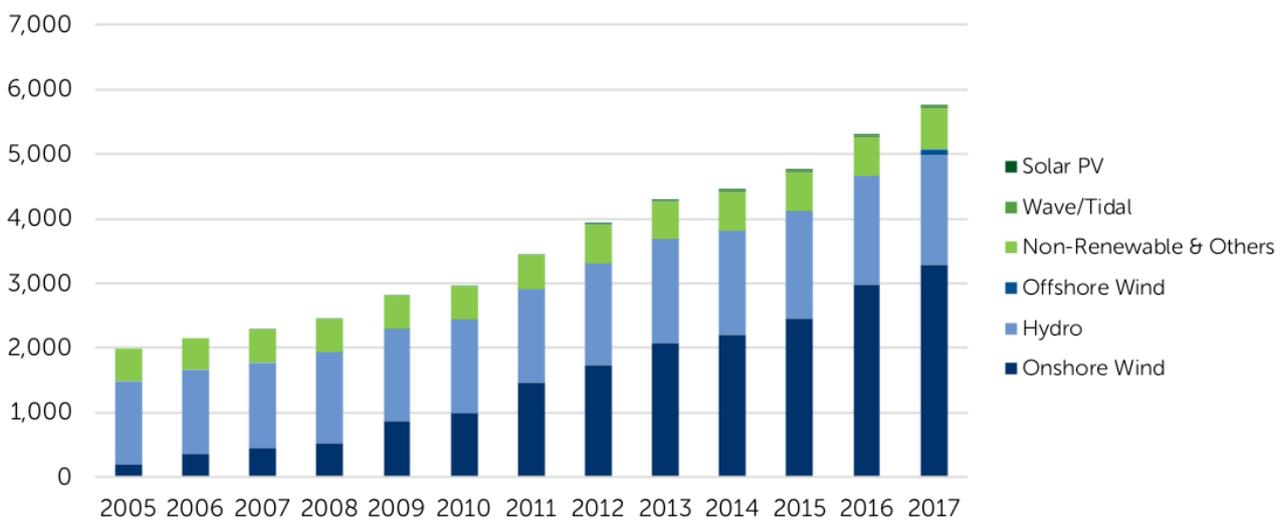
In 2017, 5,760MW of generation capacity was present on our network. This is significantly more than what was present on our network in 2005. Since 2015, 995MW of generation has connected to the network. In 2016, more than 500MW of renewable generation was connected to the network, a record for the network which was largely driven by the need to connect onshore wind projects before the closure of the Renewables Obligation (RO) scheme on 31 March 2017.

Currently, the largest generation technology on our network is onshore wind, which represented 57% of the generation capacity present on the network in 2017. As the network in the north of Scotland becomes more decarbonised, fossil fuel plays a smaller role in the electricity mix, with the gas CCGT power station at Peterhead representing only 7% of generation capacity on the network in 2017.

In the paper that we published in August 2017, embedded generation, generation connected to the distribution network, played an important role, representing more than 50% of the total generation capacity on the network in 2015. Since then, several large-scale generation projects have connected to the transmission network so that generation connected at the transmission level now represents 56% of the total generation capacity on the network in 2017.



Figure 1: Total generation capacity on the network by technology



Source: SHE Transmission plc

Electricity consumption

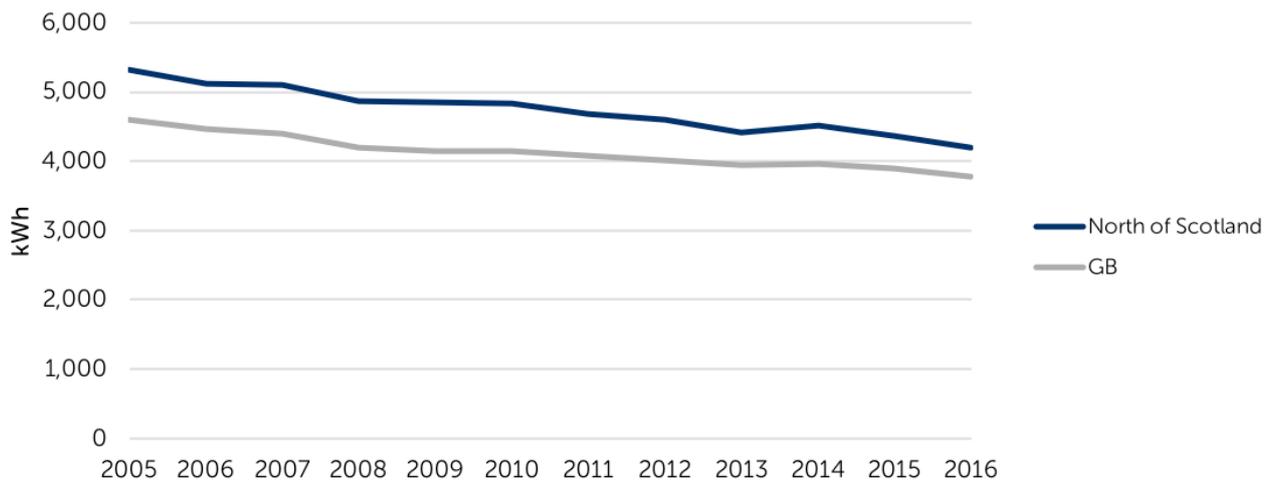
Residential

A reduction in total electricity consumption and average electricity consumption for residential customers is continuing in the north of Scotland which is broadly in line with the decline seen at a GB level. According to the Department for Business, Energy & Industrial Strategy, efficiency improvements in appliances and lighting may be contributing to the decline in residential electricity consumption across GB.

Average residential electricity consumption in the north of Scotland fell from 4,356kWh to 4,194kWh, a reduction of 3.7% from 2015 to 2016. This continues the trend that we reported in our 2017 paper. Further to this, a reduction was seen across all the local authorities in the north of Scotland, with Aberdeen City seeing the largest decrease from 2015 to 2016 with average residential electricity consumption falling by 6.1%.

Building upon our previous paper, the Orkney Islands and the Shetland Islands remain as the two local authorities with the highest levels of average residential electricity consumption in the north of Scotland. This could be attributed to their location and dependency upon electric heating to meet domestic heating requirements.

Figure 2: Non weather-adjusted average residential electricity consumption per point of supply in the north of Scotland



Source: Department for Business, Energy & Industrial Strategy Sub-national electricity publication 2005-2016

Electric Heating

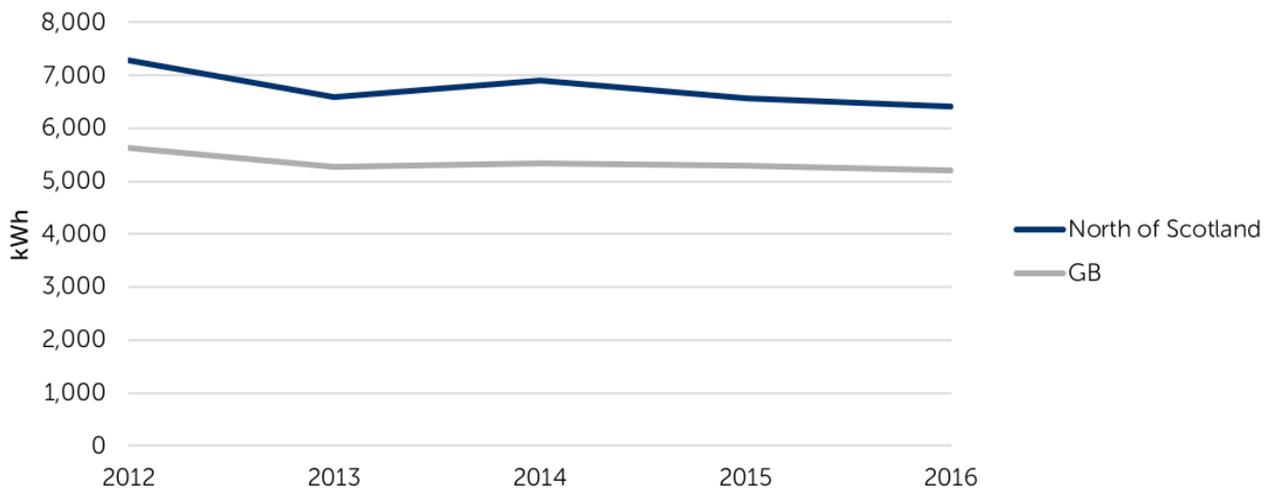
Our analysis last year highlighted that the use of economy 7 meters (commonly used for metering electric heating) occurs across all local authorities in the north of Scotland and that it is not simply limited to off gas grid areas such as the Islands. This can be attributed to flats and tenements in urban areas using electricity as a heating fuel.

In the north of Scotland, average residential electricity consumption from economy 7 meters decreased by 2.5% from 2015 to 2016 whereas at a GB level, consumption fell by 1.6% in the same period. Aberdeen City was the local authority with the largest decrease in average residential electricity consumption from economy 7 meters in the north of Scotland, reducing by 4.8% from 2015 to 2016.

The Scottish Government's Climate Change Plan includes a challenging target for low carbon heating technologies, stating that by 2032, 35% of heat for domestic buildings will be supplied using low carbon technologies¹. The target includes the electrification of heat. In the future, electric heating may be classified as a low carbon heating technology due to further decarbonisation of electricity generation, which may impact how quickly the target is met.



Figure 3: Non weather-adjusted average residential electricity consumption from economy 7 meters per point of supply in the north of Scotland



Source: Department for Business, Energy & Industrial Strategy Sub-national electricity publication 2005-2016

Industrial and commercial

In our paper last year, our analysis highlighted that total and average electricity consumption for industrial and commercial customers in the north of Scotland was increasing, contrary to the decline seen in residential electricity consumption. This could have been attributed to increases in production in the food and drink industry in the north of Scotland according to stakeholder feedback. However, our current analysis shows a return to a decline in total and average industrial and commercial electricity consumption in the north of Scotland.

At a GB level, average industrial and commercial electricity consumption reduced by 10.4% from 2015 to 2016 whereas in the north of Scotland, average industrial and commercial electricity consumption decreased from 70,969kWh to 53,744kWh, a reduction of 24.3% from 2015 to 2016. All local authorities saw a reduction in average electricity consumption from 2015 to 2016, with the Orkney Islands (52.8%), Highland (38.2%) and Aberdeenshire (28.5%) registering the largest reductions in average industrial and commercial electricity consumption in the north of Scotland.

Further investigation is required to understand the reasons for the decrease in industrial and commercial electricity consumption. We will tackle this issue in our upcoming consultation on industrial and commercial demand which we will publish later in the year.

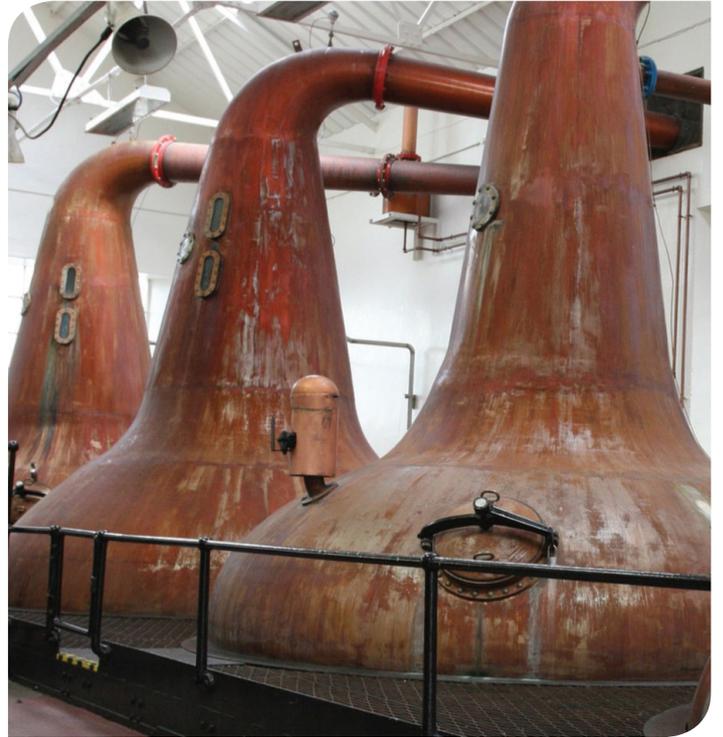
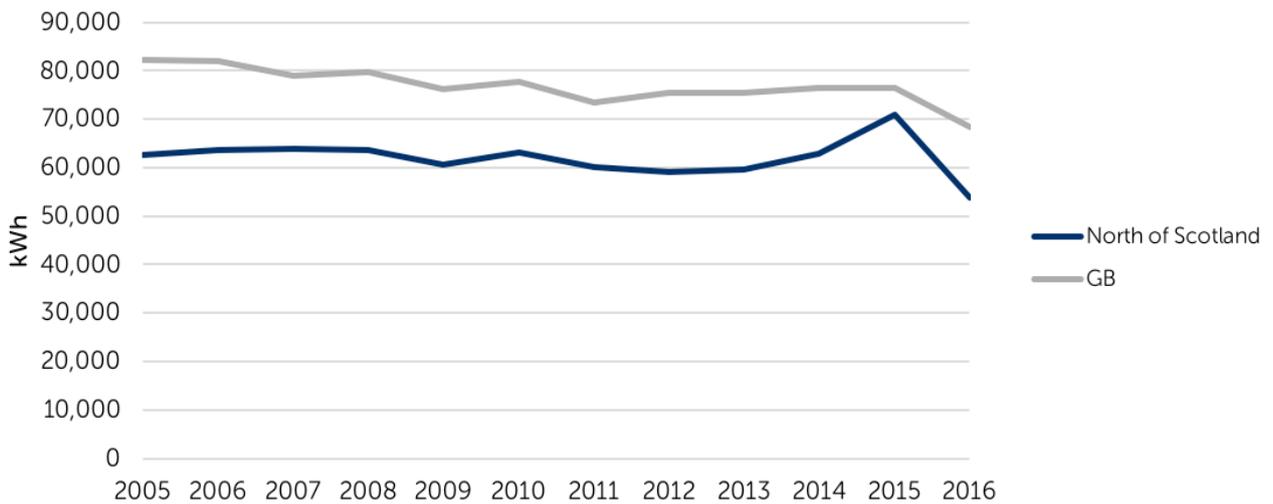


Figure 4: Non weather-adjusted average industrial and commercial electricity consumption per point of supply in the north of Scotland



Source: Department for Business, Energy & Industrial Strategy Sub-national electricity publication 2005-2016

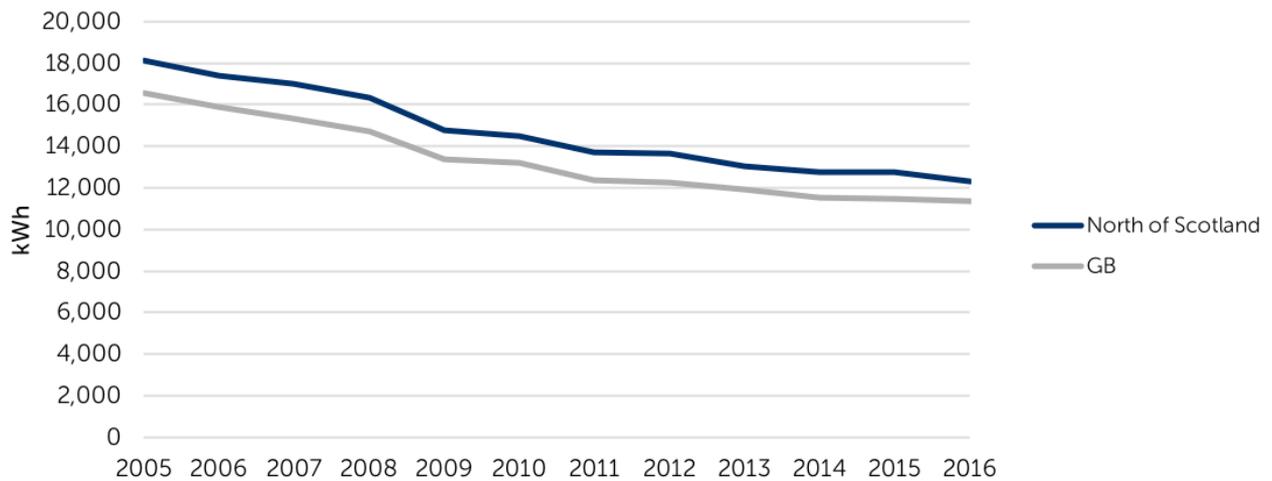
Gas consumption

Residential

An increase in total gas consumption for residential customers occurred from 2015 to 2016 at a GB and north of Scotland level. However at a GB level, average residential gas consumption declined by 1.1% from 2015 to 2016. Average residential gas consumption in the north of Scotland reduced at a faster rate in the same period, decreasing by 3.9%. All local authorities saw a reduction in average residential gas consumption from 2015 to 2016, with Aberdeen City (4.4%), Aberdeenshire (4.2%) and Highland (4.1%) recording the largest reductions in average residential gas consumption in the north of Scotland.

In the period from 2014-2016, approximately 208,000 households in the north of Scotland did not have access to the gas grid². Other fuel sources for heating such as electricity, oil and LPG are used by households in the absence of having access to gas. Energy costs play a role in contributing to fuel poverty alongside other factors such as building fabric, energy efficiency and income. In the north of Scotland, there are a high percentage of households in Eilean Siar (56%), Highland (52%) and the Orkney Islands (59%) local authorities which are in fuel poverty. These local authorities also represent areas where there is high electricity usage to heat homes. The Fuel Poverty (Target, Definition and Strategy) (Scotland) Bill 2018, introduced in June 2018, states that by 2040, no more than 5% of households in Scotland will be in fuel poverty³. We believe this will require a co-ordinated approach across Scottish Government, local authorities and delivery partners to ensure that this ambitious target is met.

Figure 5: Weather-adjusted average residential gas consumption used for heating per point of supply in the north of Scotland



Source: Department for Business, Energy & Industrial Strategy Sub-national gas publication 2005-2016

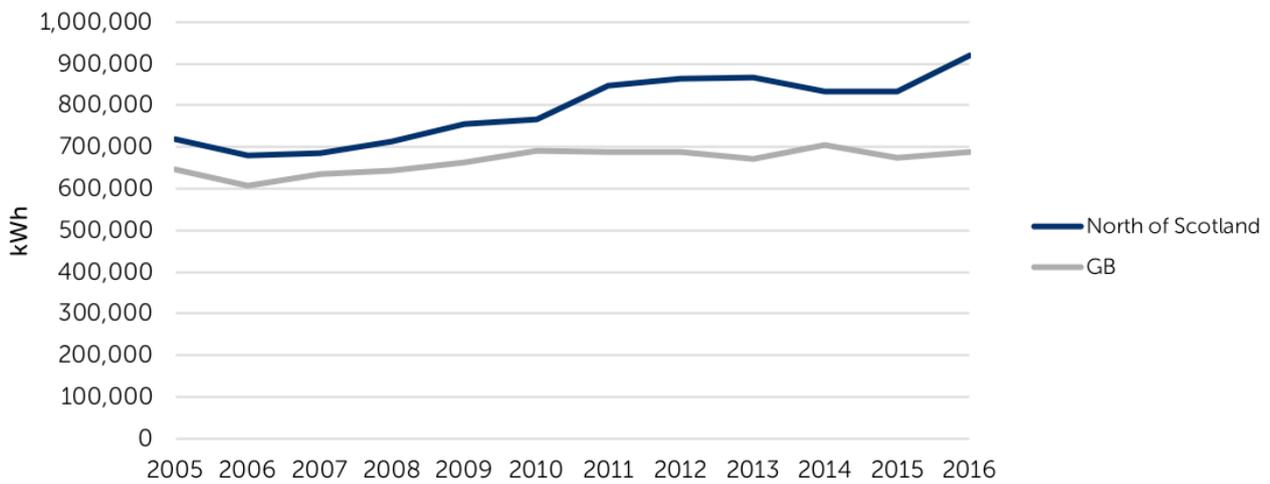
Industrial and commercial

From 2015 to 2016, total industrial and commercial gas consumption increased at a GB and north of Scotland level. In the same period, average industrial and commercial gas consumption in the north of Scotland increased from 834,144kWh to 919,301kWh, an increase of 10.2%, whereas at a GB level, a modest 2.1% increase occurred from 2015 to 2016.

There are some specific local authorities where there have been significant increases in average gas consumption from 2015 to 2016; Aberdeen City (47.7%) and Dundee City (22.5%). The remaining local authorities saw a reduction in average gas consumption from 2015 to 2016, with two of the three Islands being excluded as no industrial or commercial customers are connected to the gas grid.

In our publication last year, Moray was identified as a local authority where significant growth in average industrial and commercial gas consumption occurred from 2005 to 2015. However, our current analysis shows that from 2015 to 2016, average industrial and commercial gas consumption in Moray declined by 6.8%. Moray has the greatest number of whisky distilleries of any whisky-producing area in Scotland. Efficiency gains in the production process may have potentially caused a decrease in gas consumption but further investigation is required to understand the reasons for the decline. We will tackle this issue in our upcoming consultation on industrial and commercial demand which we will publish later in the year.

Figure 6: Weather-adjusted average industrial and commercial gas consumption per point of supply in the north of Scotland



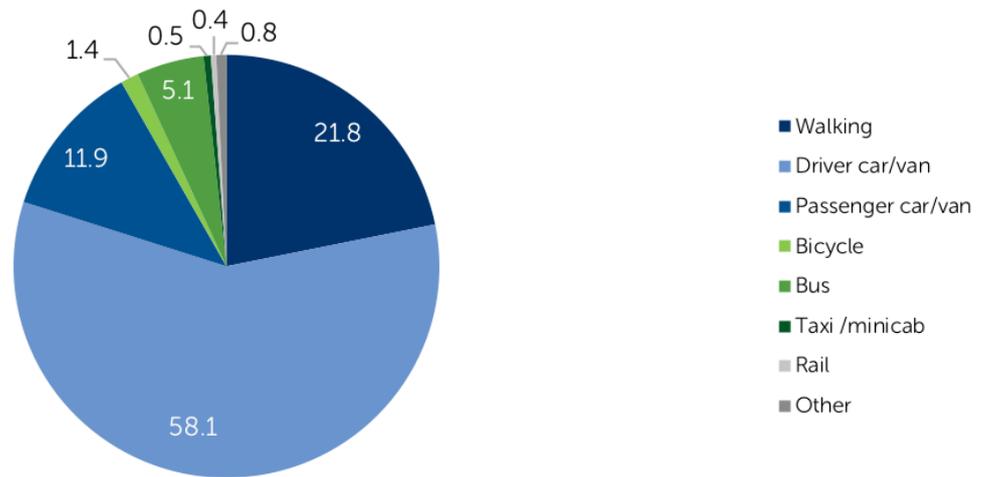
Source: Department for Business, Energy & Industrial Strategy Sub-national gas publication 2005-2016

Transport

Transport continues to be a focus for the Scottish Government. The publication of the Transport (Scotland) Bill proposed measures that would take forward some of the Scottish Government’s commitments from its 2017-18 Programme for Government, such as the introduction of low emission zones into Scotland’s four biggest cities (Glasgow, Edinburgh, Aberdeen and Dundee) between 2018 and 2020⁴.

In the paper that we published in August 2017, driving was identified as the most popular mode of transport in 2015, with 56.4% of people in the north of Scotland using this mode of travel. In our current analysis, this continues to be the case, as the proportion of people driving in the north of Scotland in 2017 increased by 1.7% to 58.1%. Walking and cycling have increased slightly in the north of Scotland from 2015 to 2017 by 0.2% and 0.3% respectively. The proportion of people in the north of Scotland using public transport such as buses decreased from 2015 to 2017 by 1.1%. Within the Transport (Scotland) Bill, local authorities would be given more powers to improve bus services through partnership working with operators or, where there is a business case for doing so, local franchising or running the services through the local authority. This may increase the share of people using public transport in future years.

Figure 7: Main mode of travel in the north of Scotland, 2017 (%)



Source: Scottish Household Survey - Travel Diary 2017

Electric vehicles

In recent years, electric vehicles (EVs) have become a topic of debate across the energy industry. UK and Scottish Government policy is very supportive of electric vehicles. However, the Scottish Government has pledged to phase out new petrol and diesel cars and vans across Scotland by 2032, eight years ahead of the UK Government’s 2040 target.

There were 1,878 licenced electric vehicles in the north of Scotland in 2017, an increase of 51.3% from 2016 with electric vehicles representing 0.24% of all vehicles in the north of Scotland. The total number of EVs licenced in GB increased by 52.3% to 127,158 vehicles in 2017, representing 0.35% of all vehicles in GB.

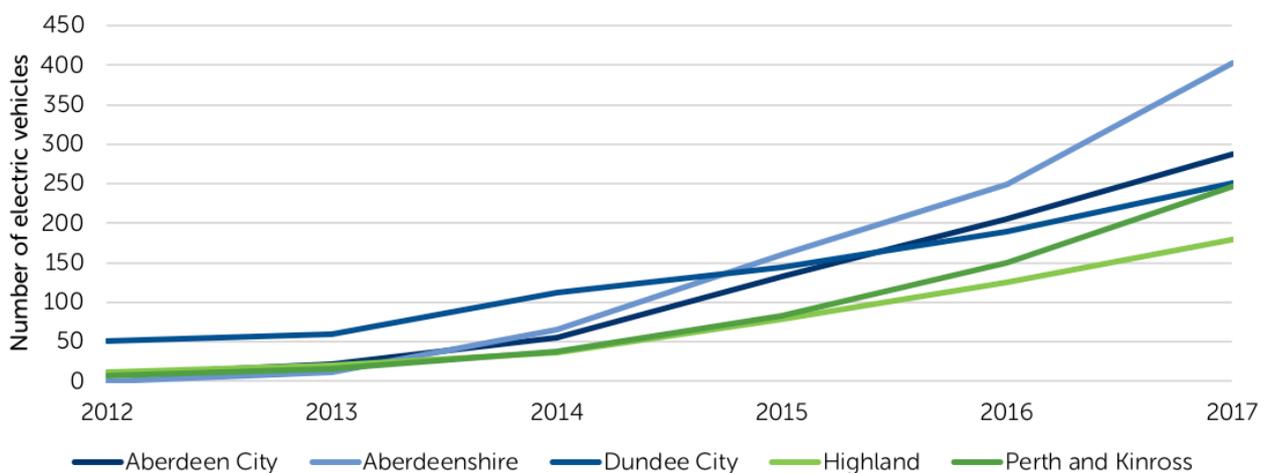
73% of local authorities in the north of Scotland had over 100 licenced EVs at the end of 2017. Similarly, to our 2017 publication, Aberdeen City, Aberdeenshire, Dundee City, Perth and Kinross and Highland remain as the local authorities with the highest total number of licenced EVs in the north of Scotland, however in all these areas, the proportion of all vehicles that are electric remains below 0.4%. Factors such as the generous loans from the Energy Saving Trust and the continued deployment of charging infrastructure across Scotland will have contributed to the increase in electric vehicles on the road.



However, in October 2018, the BEIS Select Committee produced a report which stated that the poor provision of charging infrastructure is one of the greatest barriers to growth of the electric vehicle market and that further investment is required to encourage consumers to switch to electric vehicles. In the Scottish Government’s Programme for Scotland 2018-19, it outlined plans to invest £15 million to add an additional 1,500 new charge points in homes, businesses and communities including 150 new public charge points⁵.

As outlined in our publication last year, local authorities will play an important role in facilitating the increase in electric vehicles. In September 2018, Dundee City announced that they will be adding an additional 60 charge points across several of its council car parks to increase the charging provision in the local authority. We will be working with local authorities across our area in the coming months to understand their charging deployment plans.

Figure 8: Top five local authorities with highest number of licenced electric vehicles in the north of Scotland



Source: Table VEH0131, Department for Transport

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We are really interested in hearing your views as to how we can keep you informed and make this better. If you have any feedback, please contact us on the details below:



Contact us:

Christianna Logan

Energy Networks Insights Manager

T: +44(0)1738 453144

M: +44(0)7584 313903

Imran Mohammed

Senior Business Insight Analyst

T: +44(0)1738 512782

M: +44(0)7342 029010

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