

Indicator name			Version
BB27 Natural gas usage – Non-domestic			31/03/16
Indicator type:	Risk/opportunity	Impact	Action
			X
SCCAP Theme	SCCAP Objective	CCRA risk/opportunity	
Buildings and infrastructure networks (Energy)	<p>B1: Understand the effects of climate change and their impacts on buildings and infrastructure networks</p> <p>B2: Provide the knowledge, skills and tools to manage climate change impacts on buildings and infrastructure</p>	BE9 Reduction in energy demand for heating	

At a glance

- Non-domestic gas consumption gives an indication of energy demand for heating
- Climate change will raise average temperatures, and so should reduce energy used for heating
- An increase in thermal efficiency and energy efficiency should also reduce energy for heating, though other drivers, such as chosen internal temperature, may increase it
- Total non-domestic gas sales decreased by almost 20% between 2005 and 2013. This decrease appears to be largely driven by a fall in the number non-domestic customers
- Per customer consumption was higher in 2013 than in 2005
- Gas consumption may decrease in future due to improved energy efficiency and a move towards renewable energy and heat sources

Latest Figure	Trend
<p>2013: Total non-domestic gas usage in Scotland: 20,545 GWh</p>	<p>There has been a decrease in non-domestic gas consumption between 2005 (25,614 GWh) and 2013 (20,545 GWh), but with fluctuations across years, with the lowest usage in 2009. Consumption decreased each year between 2010 and 2013.</p>

Why is this indicator important?

An increase in average winter temperatures provides an opportunity for Scotland to reduce its gas consumption. This will help contribute to one of the four transformational outcomes (a largely

decarbonised heat sector by 2050 with significant progress by 2030) necessary to meet Scotland's target of an 80% greenhouse gas emission reduction by 2050 (Scottish Government, 2013). Of the 55% of total energy consumption accounted for by heat demand, approximately 60% is consumed in the industrial and commercial sectors. Scotland needs to reduce energy demand and decarbonise the supply ensure a secure and low carbon energy supply for the long-term (Scottish Government, 2013).

The aim of UK energy policy is to ensure consumers have access to energy services (physical security) while avoiding excessive price volatility (price security) (DECC (2012)). Energy policy is largely a reserved matter (i.e. policy from Westminster), but energy security is a priority for the Scottish Government, which has powers relating to planning, energy infrastructure and generation, and responsibility for resilience, response handling, and civil contingencies. Reducing dependence on fossil fuels will reduce Scotland's greenhouse gas emissions, and will make the energy supply less vulnerable to the volatility of wholesale gas prices (Scottish Government (2013)).

Related indicators:

BB26 Natural gas usage; domestic

What is happening now?

According to the Second Report on Policies and Proposals to reduce Greenhouse Gas Emissions, non-domestic sector policy is focused on energy and resource efficiency measures and the decarbonisation of heat (Scottish Government (2013)). Schemes to address these aims include:

- Smart meters (UK)
- Carbon Reduction Commitment energy efficiency scheme (UK/Scottish)
- Buildings energy standards–new build properties (2010 Scottish);
- Green Deal (UK); EU products policy (EU)
- The non-domestic Renewable Heat Incentive (UK)

Buildings account for over 40% of greenhouse gas emissions in the UK. The Scottish Government is developing regulations under Section 63 of the Climate Change (Scotland) Act for assessment of the energy performance and emissions of existing non-domestic buildings, and for owners to improve the energy performance of their buildings and to reduce emissions (Scottish Government (2013)). The following programmes have been initiated as part of this process:

- Non-domestic buildings new-build energy standards (2014);
- Assessment of energy performance and emissions regulations (non-domestic buildings)
- Public sector additional potential
- Non-domestic low carbon heat.

(See Scottish Government, 2013 for further information on these initiatives).

What has happened in the past?

Table 1 contains details of total Scottish non-domestic gas sales between 2005 and 2013. Overall, figures have fallen since 2005, but with some fluctuations and with lowest total sales in 2009. The reduction is mainly due a decrease in the number of non-domestic gas customers. Consumption rose per customer between 2005 and 2010 but in the four years since then there has been a decrease in average consumption per customer.

Table 1: Total non-domestic gas sales (GWh) and average consumption per customer (kWh)

Year	Total non-domestic gas sales (GWh)	Number of non-domestic gas customers (thousands)	Average gas consumption per customer (kWh)
2005	25,614	34.3	745,902
2006	24,468	32.5	752,127
2007	25,121	31.2	804,581
2008	24,083	29.4	818,875
2009	20,378	25.8	788,367
2010	22,860	25.4	900,672
2011	22,179	24.7	898,734
2012	21,729	25.0	883,124
2013	20,545	24.0	849,129

What is projected to happen in the future?

It is expected that non-domestic gas consumption in Scotland will decrease in the future. This is driven by changes such as the improved energy efficiency of buildings and technology, an increase in the proportion of energy and heat generated from renewable sources and a reduction in the number of non-domestic gas customers.

Scottish Government is working towards a largely decarbonised heat sector, with a mid-term target of making significant progress towards this goal by 2030. This will be achieved through a combination of reduced demand and improved energy efficiency, together with an increase in the use of renewable or low carbon heating. Currently 3% of energy for heating is derived from renewable sources and the target for 2020 is to increase this to 11%, and to reduce final energy consumption by 12% relative to the 2005-2007 baseline figures (Scottish Government, 2015).

The UK Government's Non-Domestic Renewable Heat Incentive (RHI) started in late 2011 with the aim of increasing the proportion of heat generated from renewable sources. It is open to industrial, commercial, public and not-for-profit sectors. Since its launch, 1GW of installed capacity has been accredited under the Non-Domestic RHI. This is significant as 1GW of installed capacity is the same peak energy output as 2 typical gas-fired power stations (Ofgem, 2014).

Of this, the accredited installed capacity for Scotland is 19% (Ofgem, 2014). The Scottish Government has set a target of providing 20% of energy through renewable sources, including 11% of the energy used for heating, by 2020 (The Scottish Government, 2009). Clearly, an increase in installed renewable heating capacity should reduce heating demand from traditional sources in the non-domestic sector (The Scottish Government, 2009).

As shown in Table 1, there has been a decrease in the number of non-domestic gas consumers since 2005. The decrease has slowed in the last few years, so it is unclear if it will continue in the future.

Patterns of change

Interpretation of indicator trends

The data show an overall decrease in non-domestic gas consumption as measured by total non-domestic gas sales since 2005. Non-domestic consumption decreased by 5% between 2012 and 2013, and the 2013 figure is almost 20% lower than the figure for 2005. This reduction may reflect improvements in energy efficiency, and may also be impacted by the recession, a continuing decline in manufacturing industries and an increase in service industries that are less energy intensive (Scottish Environment Statistics Online, 2015).

Limitations

Non-domestic users are classified on the basis of those consumers who have a gas demand greater than 73,200 kWh per year, which in practice means a proportion of small business users are included in the domestic category rather in the non-domestic category. Additionally, gas use by power stations, some large industrial users, and a relatively small quantity of gas not supplied via the National Transmission System, is excluded from the figures (DECC, 2014a).

While the Digest of UK Energy Statistics (DUKES) is compiled using a top-down approach, with statistics gathered by energy companies on a national level, sub-national datasets are compiled using a bottom-up approach, from an initial set of individual Meter Point Reference Number (MPRN) data. At sub-national level, the figure provided to the DECC for energy consumption analysis for the Gas Industry is in the form of the Annual Quantity (AQ). This is based on (MPRN) data provided by Xoserve and independent gas transporters (DECC, 2014a).

The formula for calculating the AQ represents an estimate of the consumption at a meter point (a single point of gas supply) for a 365-day year, under seasonal normal weather conditions. The AQ is based on the consumption between two meter readings, which are unlikely to be taken precisely 365 days apart. To account for this, the AQ calculation adjusts for the bias of the read period towards winter or summer, and for the difference from seasonal normal conditions (DECC, 2014b). This means that the data has been adjusted to account for differences in temperature and wind each year within the specific geographic area. This correction is applied to allow for more consistent comparison of gas consumption over time. However, this limits the ability of the indicator to reflect the effects of climate change. The current data sources available to DECC do not allow for removal of the weather correction factor from the annual quantities (DECC, 2014a). A full description of the calculation is detailed in the methodology section.

References

Department of Energy & Climate Change (DECC) (2012). *Energy Security Strategy*. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/65643/7101-energy-security-strategy.pdf

Department of Energy & Climate Change (DECC) (2014a). *Sub-national consumption statistics: Methodology and guidance booklet*. Available at: <https://www.gov.uk/government/publications/regional-energy-data-guidance-note>

Department of Energy & Climate Change (DECC) (2014b) *Overview of weather correction of gas industry consumption data*. Available at: <https://www.gov.uk/government/statistics/overview-of-weather-correction-of-gas-industry-consumption-data>

National Energy Efficiency Data framework (NEED) (2014). Summary of Analysis 2014. Available at: <https://www.gov.uk/government/statistics/national-energy-efficiency-data-framework-need-report-summary-of-analysis-2014>

National Grid (2012). Gas Demand Forecasting Methodology. Available at: <http://www.nationalgrid.com/NR/ronlyres/71CFD0F6-3607-474B-9F37-0952404976FB/52071/GasDemandForecastingMethodologyFeb12.pdf>

National Records of Scotland (NRS) (2014). *High Level Summary of Statistics: Population and Migration*. Available at: <http://www.nrscotland.gov.uk/files/statistics/high-level-summary/j11198/j1119800.htm>

OFGEM (2014). Non-Domestic Renewable Heat Incentive (RHI). Available at: <https://www.ofgem.gov.uk/ofgem-publications/92035/rhi1gwmilestone.pdf>

Palmer, J. & Cooper, I. (2013) *United Kingdom housing energy fact file*. DECC. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/345141/uk_housing_fact_file_2013.pdf

Scottish Environment Statistics Online (2015). *Total amount of gas consumed in Scotland: 2005 – 2013*. Available at: <http://www.gov.scot/SESO/DatasetSearch.aspx?TID=197>

The Scottish Government (2009). *Renewable Heat Action Plan for Scotland*. Available at: <http://www.gov.scot/resource/doc/290657/0089337.pdf>

The Scottish Government (2013). *Low Carbon Scotland: Meeting the Emissions Reduction Targets 2013-2027: The Second Report on Proposals and Policies*. Available at: <http://www.scotland.gov.uk/Resource/0042/00426134.pdf>

The Scottish Government (2014). *Energy in Scotland Compendium 2014*. Available at: <http://www.scotland.gov.uk/Resource/0044/00444530.pdf>

The Scottish Government (2015). *Energy in Scotland 2015*. Available at: <http://www.scotland.gov.uk/Resource/0046/00469235.pdf>

Further information

The Digest of UK energy statistics is available at: <https://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes>

Acknowledgements

This indicator was produced by Ailsa Strathie, Lynne Jack and colleagues at Heriot-Watt University with input from Darcy Pimblett (CXC) and Katherine Beckmann (Heriot Watt and CXC).

Appendix One: Indicator metadata and methodology

Table 1: Indicator metadata

	Metadata
Title of the indicator	BB27 Natural gas usage; Non-domestic
Indicator contact: Organisation or individual/s responsible for the indicator	ClimateXChange
Indicator data source	Department of Energy & Climate Change (DECC) – Data publicly available via the Digest of UK Energy statistics (DUKES) and on website of Scottish Government.
Data link: URL for retrieving the indicator primary indicator data.	https://www.gov.uk/government/collections/sub-national-gas-consumption-data or http://www.scotland.gov.uk/Topics/Statistics/Browse/Business/Energy/Database

Table 2: Indicator data

	Indicator data
Temporal coverage: Start and end dates, identifying any significant data gaps.	2005 -2013
Frequency of updates: Planned or potential updates	Data is updated annually. A year runs from 1 st October to 30 th September.
Spatial coverage: Maximum area for which data is available	Data is available for the whole of Scotland.
Uncertainties: Uncertainty issues arising from e.g. data collection, aggregation of data, data gaps	Categorisation – usage below 73,200 kWh per year labelled as domestic, meaning some small businesses may not be included in non-domestic category. Consumption data are modelled based on meter readings and are weather corrected at sub-UK level.
Spatial resolution: Scale/unit for which data is collected	Total non-domestic consumption Scotland-wide (GWh)
Categorical resolution: Potential for disaggregation of data into categories	Data are available at local authority level and at Intermediate Geography Zone (IGZ) level via DUKES.
Data accessibility: Restrictions on usage, relevant terms & conditions	Publicly available data

Table 3 Contributing data sources

Contributing data sources
Data sets used to create the indicator data, the organisation responsible for them and any URLs which provide access to the data.
The DECC sub-national consumption gas consumption data is available here: https://www.gov.uk/government/collections/sub-national-gas-consumption-data

Table 4 Indicator methodology

Indicator methodology
The methodology used to create the indicator data
<p>The figure provided to DECC for energy consumption analysis for the Gas Industry is in the form of the Annual Quantity (AQ). This is based on meter point (MPRN) data provided by Xoserve and independent gas transporters; the process is described in detail in the <i>Overview of Weather Correction of Gas Industry Consumption Data</i> (DECC, 2014a). Much of the following description of the process is derived from this source.</p> <p>The formula for calculating the AQ represents an estimate of the consumption at a meter point (a single point of gas supply) for a 365-day year, under 'seasonal normal weather conditions'. The AQ is based on the consumption between two meter readings, which are unlikely to be taken precisely 365 days apart. To account for this, the AQ calculation adjusts for the bias of the read period (towards winter or summer) and for the difference between seasonal normal conditions (DECC, 2014b).</p> <p>Weather correction is applied at End User Category (EUC) level. It is derived from the AQ, the level of winter consumption, and the geographical region. A daily usage profile is agreed for each EUC for each year based on seasonal normal conditions, and daily weather fluctuations are also taken into account. The profiles are updated each October based on actual consumption data from a sample of meter points. Xoserve adjust the standard usage profile for actual weather, which is describe as a: 'weather desensitisation rather than a correction' (DECC, 2014b, p1) as the purpose of the adjustment is to allow for comparison of consumption across different read periods and durations. Actual consumption can then be divided by the summed daily usage factors and multiplied by 365. This means that where weather is has been colder than seasonal normal temperatures, the AQ will be lower than actual consumption. The weather correction factor is based on a Met Office model which uses historic data and also forecasts ten years into the future (National Grid, 2012).</p>