



Department for
Business, Energy
& Industrial Strategy

SUB-NATIONAL ELECTRICITY AND GAS CONSUMPTION STATISTICS

Regional, Local Authority, middle and lower
layer super output area



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Executive summary

This publication provides estimates of annual electricity and weather corrected gas consumption below national level. Latest estimates are for 2015.

In 2015 total domestic gas consumption increased very slightly, by 0.3 per cent compared to 2014, to 308,749 GWh. Although the rise was small, it marks the first increase since the series began in 2005, ending the downward pattern that has seen demand fall by a quarter over this time. At a household level however, both mean and median consumption fell, by 0.3 per cent compared to 2014. The overall rise in consumption was instead driven by a rise in the total number of households consuming gas of 0.7 per cent, which outweighed the smaller decrease in average consumption.

The rise in the number of households consuming gas was also reflected in the off-gas grid results, with the number of households not connected to the grid falling by one percentage point to nine per cent.

The rise in domestic gas consumption may, however, be consistent with a general fall in domestic energy consumption – as households switch to gas from other less efficient heating fuels. Indeed, mean domestic electricity consumption in 2015 was down 1.5 per cent compared to the previous year (the median was down 1.3 per cent).

On the non-domestic side in 2015 both total and mean gas demand fell, by 3.9 and 4.3 per cent respectively compared to 2014. This more than offset the small rise in gas consumption in the domestic sector, with total gas consumption falling 1.3 per cent. Meanwhile, mean non-domestic electricity demand increased by 0.5 per cent over the same period.

1. Introduction

1.1 Background

This document provides commentary on BEIS's sub-national estimates of electricity and weather corrected gas consumption for Great Britain. Estimates are based on meter point data provided by the electricity and gas industries from their administrative systems. The most recent estimates are provisional estimates for 2015.

Estimates are published from domestic and non-domestic users and broken down by Region/Devolved Administration¹ (referred to as regions for the rest of this document) and local authority. Middle layer super output area (intermediate geography zone in Scotland) and lower layer super output area (England and Wales, domestic, only) estimates for 2015 will be published on 26 January 2017, and made available here:

<https://www.gov.uk/government/collections/sub-national-electricity-consumption-data> (for electricity) and <https://www.gov.uk/government/collections/sub-national-gas-consumption-data> (for gas).

For full details on the methodology, assumptions and data interpretation relating to these statistics, please refer to the Methodology and Guidance document available here: <https://www.gov.uk/government/publications/regional-energy-data-guidance-note>. Readers are highly advised to familiarise themselves with the material in the booklet before using the data.

For national estimates of domestic consumption Table 3.03 of ECUK² should be used. Breakdowns of consumption by property attributes and household/business characteristics are available through the National Energy Efficiency Data-Framework (NEED)³.

More information on the changes and future planned developments are outlined in section 6 of this report.

1.2 Users

The most significant use of the sub-national consumption data is by Local Authorities and devolved administrations, other external users including academics and industry. Most commonly data have been used for targeting, to examine trends over time, or assess the effectiveness of carbon reduction and energy efficiency policies and initiatives.

¹ A region refers to areas previously known as Government Office Regions (GORs), which were the primary statistical subdivision of England in which the Government Offices for the region fulfilled their role. They closed on 31 March 2011 and have remained a static geography used for statistical reporting since then. Further information is available in section 1.2 of the Sub-national methodology and guidance booklet.

² <https://www.gov.uk/government/statistics/energy-consumption-in-the-uk>.

³ <https://www.gov.uk/government/collections/national-energy-efficiency-data-need-framework>.

Introduction

Internally, data are used by BEIS policy colleagues and other analysts to inform policy development and help with monitoring and evaluation of BEIS policies. The meter point gas and electricity data collected for sub-national consumption outputs are also used in NEED.

Feedback from users of these data is welcomed. If you have any comments or queries please contact us at EnergyEfficiency.Stats@decc.gsi.gov.uk.

2. Electricity

The data analysed in this document are based on the aggregation of Meter Point Administration Number (MPAN) readings throughout Great Britain obtained as part of BEIS's annual meter point electricity data collection exercise. The estimates presented for 2015 are provisional and cover the industry defined years:

- Electricity non-half hourly⁴ - 26 January 2015 to 25 January 2016;
- Electricity half hourly⁵ - 1 January 2015 to 31 December 2015

This section looks at electricity consumption by consuming sector (i.e. domestic and non-domestic), and geographic area (region and local authority).

Annual data for 2005 to 2015 can be found here:

<https://www.gov.uk/government/collections/sub-national-electricity-consumption-data>.

2.1 Total electricity consumption

During 2015, the total annual electricity consumption in Great Britain was 292,155 GWh (via 30.0 million meters), 1.1 per cent lower than consumption in 2014 (295,325 GWh)⁶.

The number of electricity meters increased in 279 of the 380 local authorities between 2014 and 2015, whilst only 146 local authorities had an increase in total annual consumption. The number of meters in an area can change as new properties are built and old properties demolished. For example, between 2012 and 2013, the number of meters in the Newham Borough of London increased by three per cent (approximately 3,200 meters). This was primarily a result of new properties being built in the Olympic Park.

Assigning a meter to an area within the sub-national electricity consumption statistics is dependent upon accurate address information for each meter. If there is no accurate address information then meters are assigned as 'Unallocated'⁷. This will have an impact on the estimates provided for some areas.

Changes in electricity consumption in Great Britain between 2014 and 2015 are summarised in Table 1. Total electricity consumption between 2014 and 2015 ranged from a 2.8 per cent increase in total consumption in the South East to a 5.5 per cent decrease in the West

⁴ A non-half hourly (NHH) meter is generally used for domestic or smaller non-domestic supplies. Reading of NHH meters is normally done manually.

⁵ A half hourly (HH) meter is generally used for larger non-domestic supplies. A reading is automatically taken every half hour and relayed to the supplier.

⁶ Sub-national estimates for total electricity consumption differ slightly from electricity consumption estimates included in Chapter 5 of the Digest of UK Energy Statistics (DUKES). For further information about the differences in electricity consumption estimates between the sub-national statistics and DUKES/ECUK, please refer to the Methodology and Guidance document available here:

<https://www.gov.uk/government/publications/regional-energy-data-guidance-note>.

⁷ 'Unallocated' meters are meters with insufficient address information to assign their consumption to a geographical area.

Midlands. Changes in total consumption levels are usually driven by changes in the non-domestic sector given that it represents 63 per cent of total consumption (in 2015) and tends to be more changeable than domestic consumption.

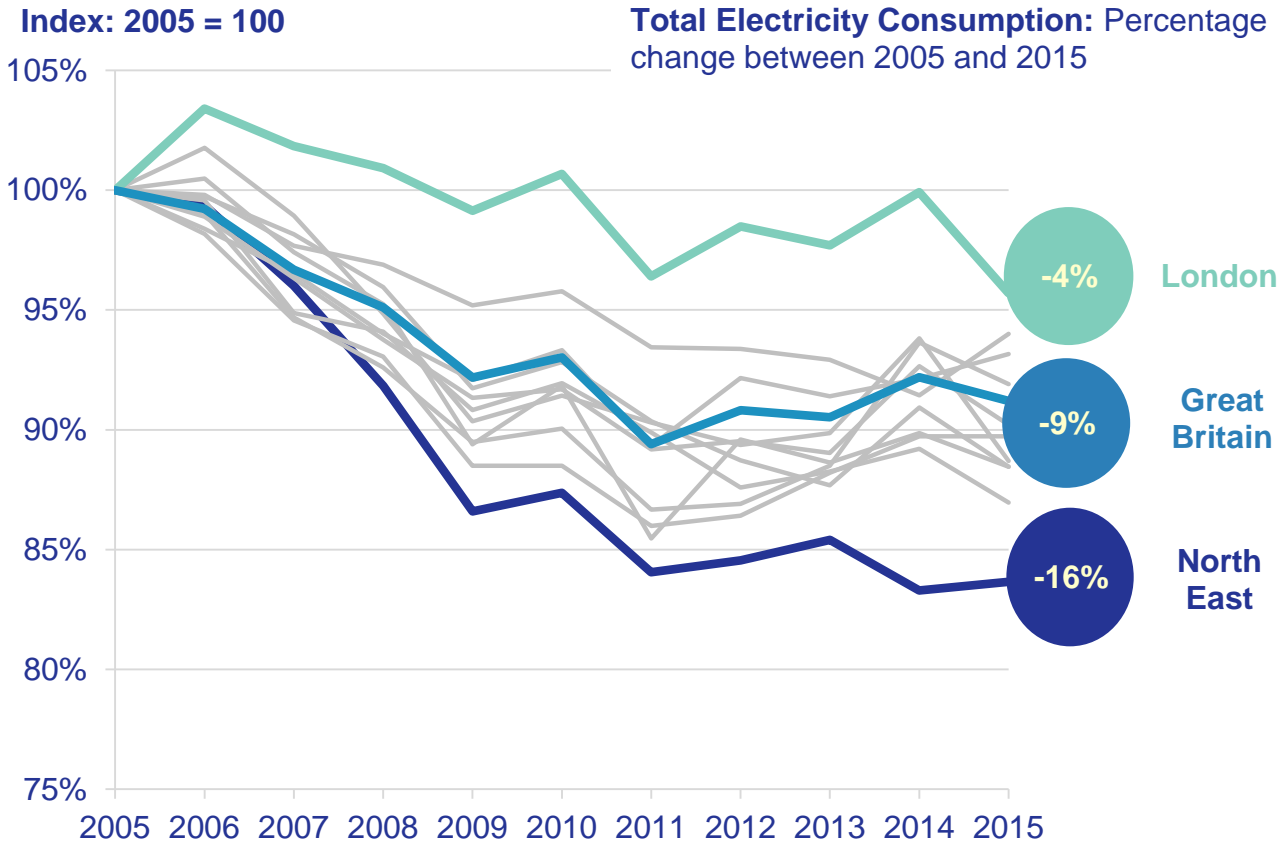
Table 1: Electricity consumption in Great Britain by region, 2014 and 2015

	2014		2015		Percentage Change	
	Total annual electricity consumption (GWh)	Number of meters (thousand)	Total annual electricity consumption (GWh)	Number of meters (thousand)	Total annual electricity consumption (GWh)	Number of meters (thousand)
East Midlands	21,479	2,166	21,478	2,179	0.0%	0.6%
East of England	26,969	2,798	27,272	2,814	1.1%	0.6%
London	41,402	3,847	39,654	3,881	-4.2%	0.9%
North East	11,575	1,281	11,626	1,295	0.4%	1.1%
North West	32,611	3,399	32,104	3,614	-1.6%	6.4%
South East	38,183	4,095	39,255	4,137	2.8%	1.0%
South West	25,262	2,718	24,598	2,640	-2.6%	-2.9%
West Midlands	25,568	2,591	24,172	2,461	-5.5%	-5.0%
Yorkshire and the Humber	23,940	2,531	23,338	2,424	-2.5%	-4.2%
England	246,991	25,426	243,499	25,446	-1.4%	0.1%
Wales	16,451	1,516	16,146	1,444	-1.9%	-4.7%
Scotland	26,831	2,978	26,100	2,982	-2.7%	0.2%
Unallocated	5,047	128	6,410	165	27.0%	28.8%
Great Britain	295,320	30,047	292,155	30,038	-1.1%	0.0%

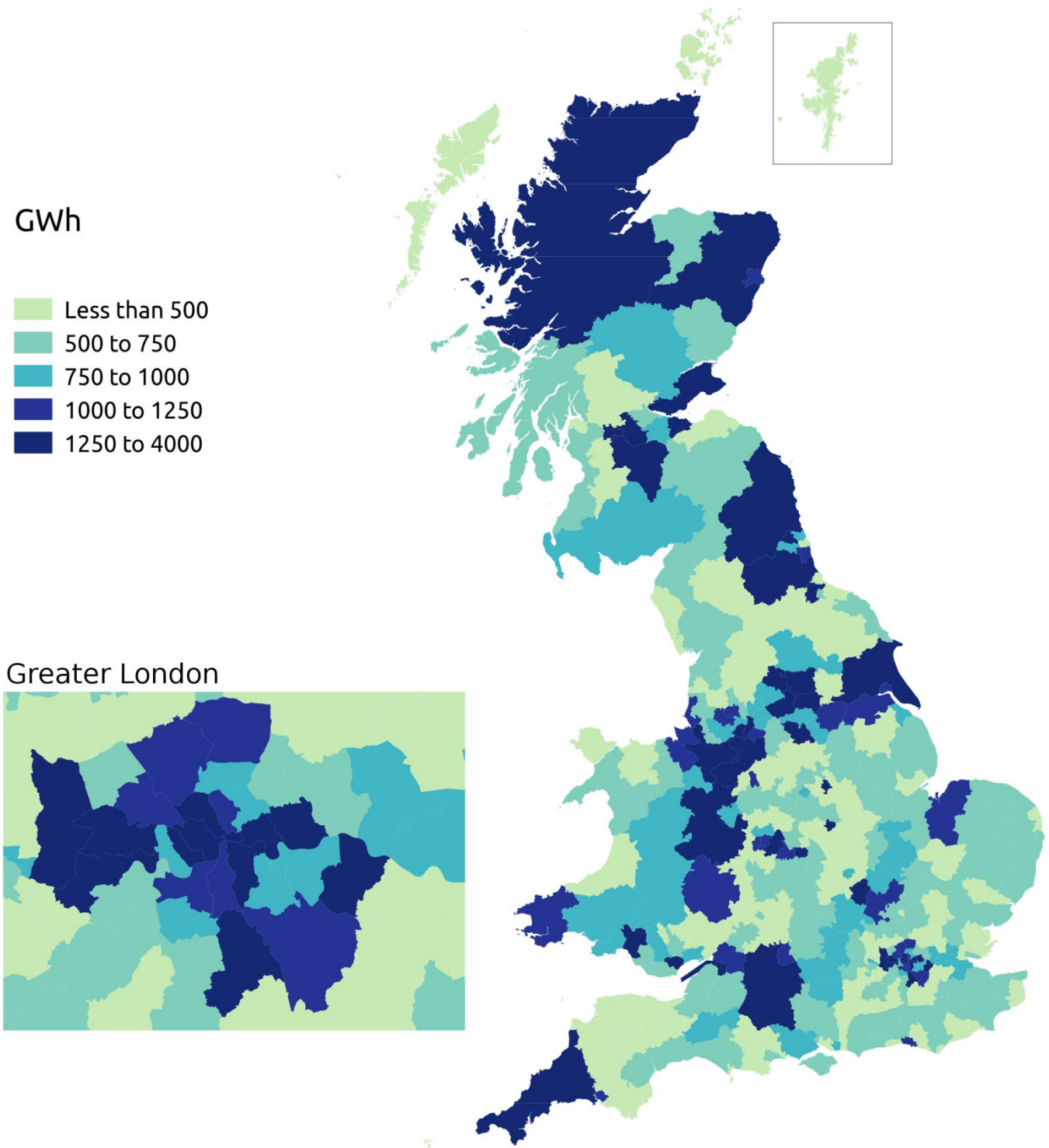
Chart 1 shows the change in total electricity consumption since 2005 (when the sub-national time series started), taking 2005 as the baseline (2005=100). It can be observed that every region follows an overall decreasing trend. The largest percentage change, between 2005 and 2015, was seen in the North East where consumption decreased by 16.3 per cent from 13,897 GWh to 11,626 GWh. Comparatively, the smallest reduction in consumption has been observed in London with a decrease of 4.3 per cent.

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Chart 1: Change in electricity consumption over time by region (2005 = 100)

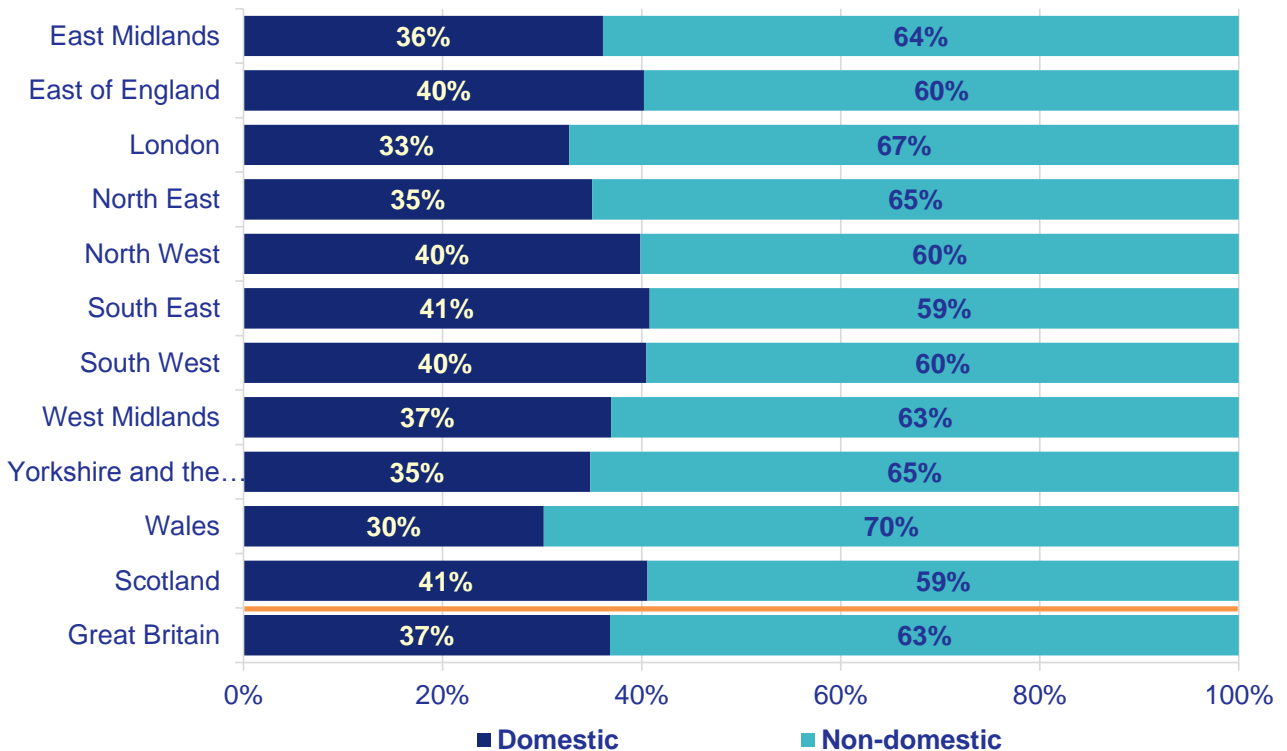


Map 1: Total annual electricity consumption by local authority, 2015



Total electricity consumption can be split between the domestic and non-domestic sectors based on the meter profile assigned by the electricity industry. Despite the fact that the non-domestic sector covers a significantly lower number of meters, the non-domestic sector consumes a much higher proportion of total electricity for all regions across Great Britain (Chart 2). Of the 30.0 million meters operating in 2015, 27.6 million were in the domestic sector, with the remainder (2.4 million) in the non-domestic sector.

Chart 2: Distribution of domestic and non-domestic electricity consumption by region, 2015



Across Great Britain, 37 per cent of electricity is estimated to be consumed in the domestic sector, and 63 per cent by the non-domestic sector (compared with 92 per cent of meters in the domestic sector and 8 per cent in the non-domestic sector). However, the split varies across the regions of Great Britain. Domestic consumption accounted for 30 per cent of total electricity consumption in Wales and 41 per cent in the South East and Scotland. The variation is even more marked across local authorities. For example, non-domestic consumption makes up more than 80 per cent of total electricity consumption in five local authorities (City of London, Neath Port Talbot, Westminster, Tower Hamlets, North Warwickshire) and as little as 32 per cent in one local authority (East Renfrewshire). The distribution depends on local factors, such as the type of industry/service, the mix of properties and the extent to which electricity is used for heating.

2.2 Domestic electricity consumption

Total domestic consumption

Total domestic electricity consumption in Great Britain in 2015, was estimated to be 107,567 GWh, 1.5 per cent lower than in 2014 (109,170 GWh), with Wales showing the largest percentage decrease (6.0 per cent). Factors influencing total domestic electricity consumption include the population/number of households in a region and the fuel mix used to meet domestic energy demands (for example, households without access to gas are likely to use more electricity for heating).

Average domestic consumption

Mean annual domestic electricity consumption per meter in Great Britain was 3,894 kWh and the median was 3,148 kWh, a difference of 24 per cent. The difference in the mean and median is more pronounced for electricity than for gas because of the variety of ways electricity is used in homes (for example, some properties use electricity for heating and others do not, while the majority of homes with a gas connection use gas for heating).

Mean consumption per meter in 2015 was 1.5 per cent lower than in 2014 (3,894 kWh) and median electricity consumption was down 1.3 per cent (3,148 kWh).

The North East had the lowest mean and median domestic consumption, 3,362 kWh and 2,852 kWh respectively, whilst the East of England had the highest mean and median domestic consumption, 4,230 kWh and 3,366 kWh respectively. Table 2 shows the mean and median domestic consumption per meter in each region in 2015 further broken down by Standard and Economy 7 meters.

Table 2: Average domestic electricity consumption per meter by region, 2015

	All domestic meters			Standard domestic meters			Economy-7 meters		
	Mean domestic consumption (kWh)	Median domestic consumption (kWh)	Number of domestic meters (thousand)	Mean domestic consumption (kWh)	Median domestic consumption (kWh)	Percentage of domestic meters	Mean domestic consumption (kWh)	Median domestic consumption (kWh)	Percentage of domestic meters
East Midlands	3,852	3,144	2,014	3,507	2,971	65%	4,490	3,519	35%
East of England	4,230	3,366	2,594	3,815	3,163	70%	5,176	3,983	30%
London	3,733	2,920	3,477	3,539	2,808	87%	4,990	3,988	13%
North East	3,362	2,852	1,211	3,251	2,822	94%	5,111	3,933	6%
North West	3,766	3,155	3,399	3,580	3,095	92%	5,874	4,686	8%
South East	4,220	3,372	3,795	3,942	3,227	82%	5,444	4,283	18%
South West	4,164	3,300	2,391	3,746	3,116	85%	6,494	5,433	15%
West Midlands	3,927	3,240	2,274	3,672	3,130	83%	5,166	4,010	17%
Yorkshire and the Humber	3,616	2,990	2,249	3,465	2,937	92%	5,471	4,257	8%
England	3,914	3,164	23,403	3,643	3,040	83%	5,260	4,071	17%
Wales	3,685	3,061	1,322	3,463	2,988	93%	6,486	5,135	7%
Scotland	3,836	3,074	2,762	3,559	2,990	84%	5,276	4,042	16%
Unallocated	3,653	2,825	135	3,411	2,714	88%	5,477	4,360	12%
Great Britain	3,894	3,148	27,622	3,624	3,030	84%	5,289	4,086	16%

Mean domestic electricity consumption per meter in Great Britain has decreased by 15.4 per cent between 2005 and 2015. Over the same period, regional reductions in domestic electricity consumption varied between 12.7 per cent in London to 18.9 per cent in the West Midlands. There are a number of factors which may have contributed to these reductions in consumption, including; weather conditions, energy efficiency improvements⁸, such as increased levels of insulation, new boilers and more energy efficient appliances; increased prices⁹; the recession; changes in the building stock; and household composition. It should also be noted that 2005,

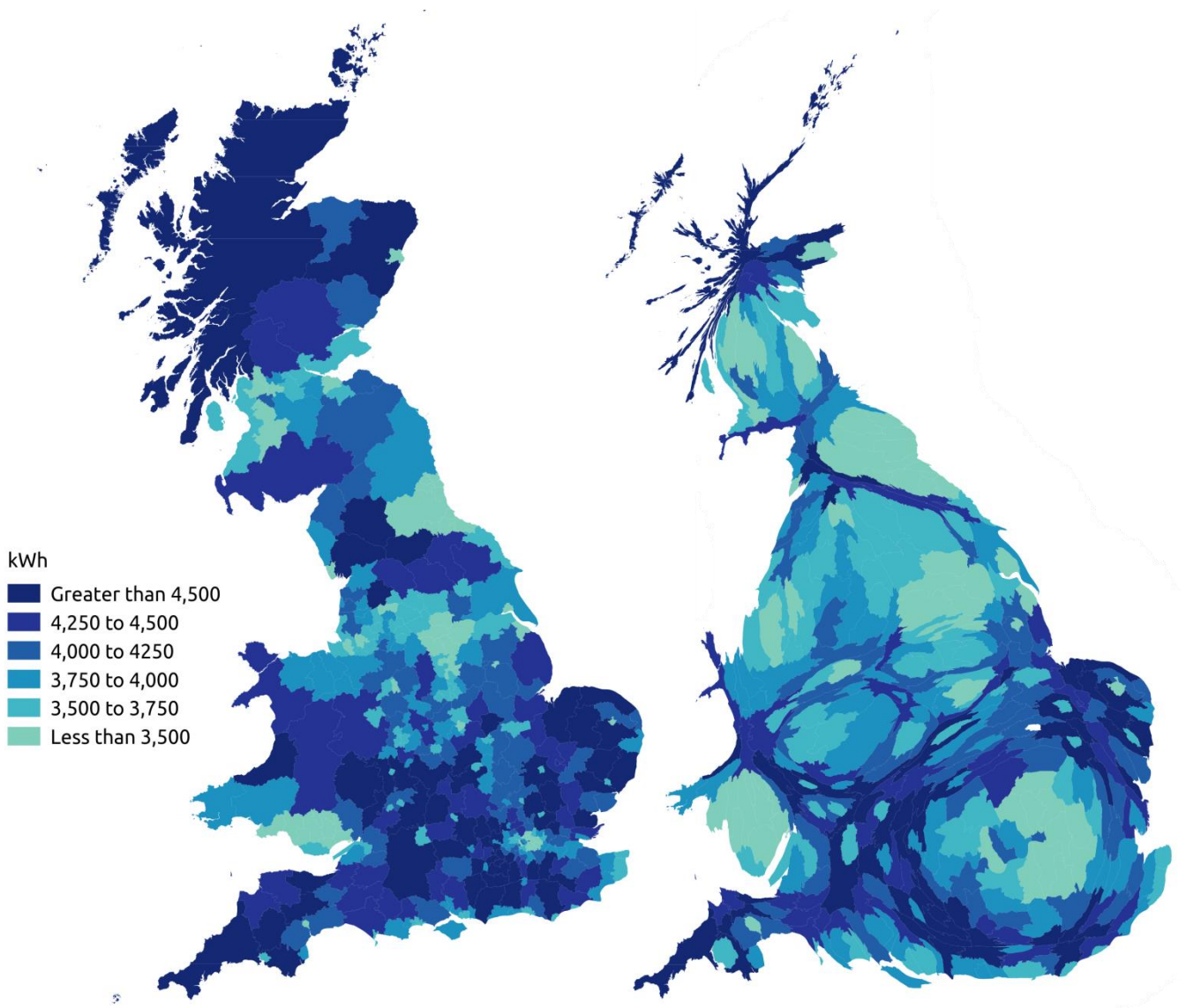
⁸ The energy efficiency of the housing stock improved between 2005 and 2014, the average SAP rating of a dwelling increased by 11.0 points from 49.4 to 60.9. The SAP rating is a measure of the overall energy efficiency of the dwelling. Table 13: English Housing Survey Headline Report 2014-15: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/501065/EHS_Headline_report_2014-15.pdf.

⁹ Between 2005 and 2015, domestic electricity prices contained in Quarterly Energy Prices show an increase of 83.6 per cent (47.9 per cent in real terms) which is likely to have influenced demand. 'Quarterly Energy Prices' can be accessed here: <https://www.gov.uk/government/statistics/quarterly-energy-prices-september-2016>

the earliest point for this analysis, is where DUKES also represents a peak in domestic electricity consumption to date¹⁰.

In the map below, known as a cartogram, the size of each local authority area has been adjusted according to its population. This can help interpretation as it prevents densely populated areas being underrepresented. For example, London accounts for 15 per cent of England's population, but only 1.2 per cent of land area; the cartogram expands the area of London to account for this.

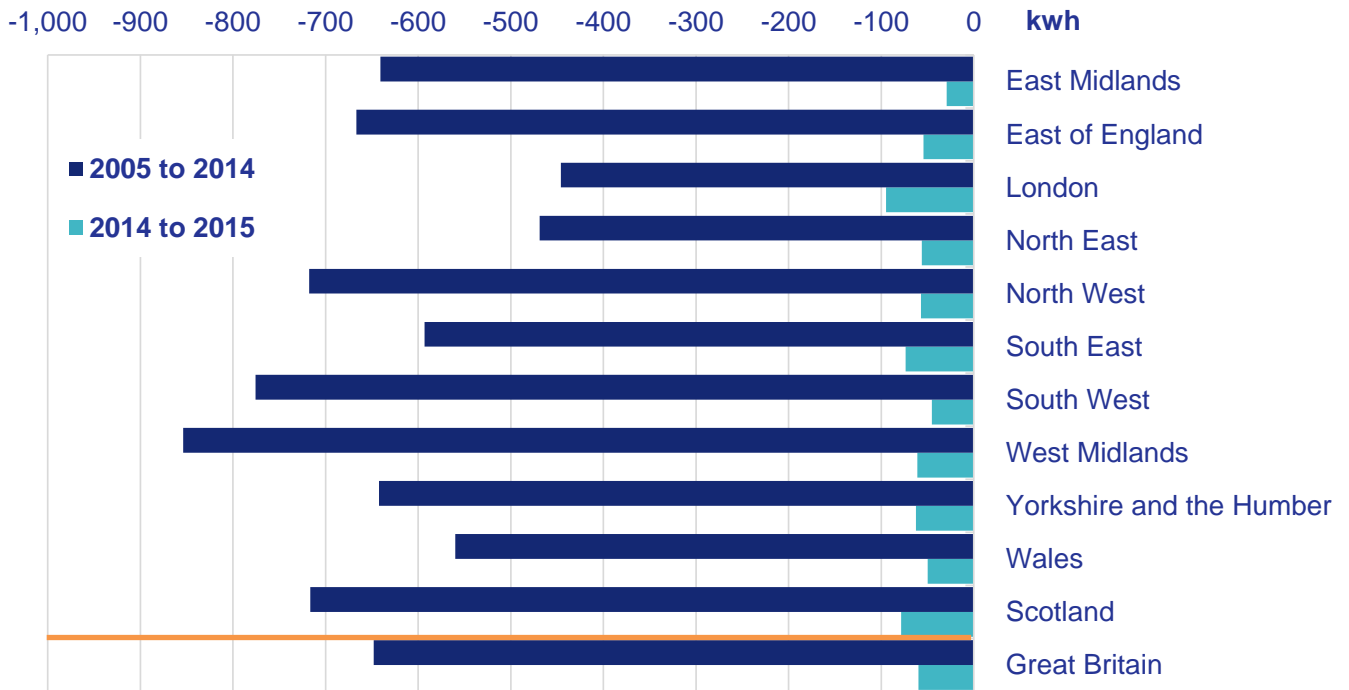
Map 2: Mean domestic electricity consumption per meter by local authority, 2015



¹⁰ See Table 5.1 of DUKES: <https://www.gov.uk/government/statistics/electricity-chapter-5-digest-of-united-kingdom-energy-statistics-dukes>.

Chart 3 shows the decrease in average domestic consumption by region when comparing against both 2005 and 2014. The West Midlands has seen the largest decrease in average domestic consumption since 2005, however, London has largest decrease compared to 2014.

Chart 3: Change in mean domestic electricity consumption per meter, 2005 and 2015



Ordinary domestic and Economy 7 consumption

Mean consumption for customers with standard domestic meters was 3,624 kWh (median consumption was 3,030 kWh) compared to 5,289 kWh for households with an Economy 7 meter¹¹ (median consumption was 4,086 kWh). Households with an Economy 7 meter are more likely to use electricity to heat their homes and therefore typically have higher consumption as well as a greater range of consumption. The region with the highest mean consumption per Economy 7 meter in 2015 was the South West (6,494 kWh mean and 5,433 kWh median) followed closely by Wales (6,486 kWh mean and 5,135 kWh median) whilst the East Midlands had the lowest average per Economy 7 meter (4,490 kWh mean and 3,519 median). It should be noted that not all customers who have an Economy 7 meter will be on an Economy 7 tariff. However, customers with an ordinary domestic meter cannot be on an Economy 7 tariff. In some instances electricity used for heating purposes will not be consumed off-peak.

Chart 4 shows the distribution between households with ordinary standard domestic meters and Economy 7 meters at regional level in Great Britain. For Great Britain, 78 per cent of total domestic consumption was attributed to ordinary domestic meters and 22 per cent to Economy

¹¹ An Economy 7 meter allows a property to have a two rate tariff if the household chooses to, usually differentiating payment by peak and (cheaper) off-peak consumption. In the majority of cases, Economy 7 meters still measure all of a household's consumption (that is, the total of its ordinary and Economy 7 consumption) through a single meter.

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7 meters. However, across Great Britain the ratio between ordinary domestic and Economy 7 varied from a 91:9 per cent split in the North East, to a 59:41 per cent split in the East Midlands.

Chart 4: Distribution of total domestic electricity consumption by profile, 2015

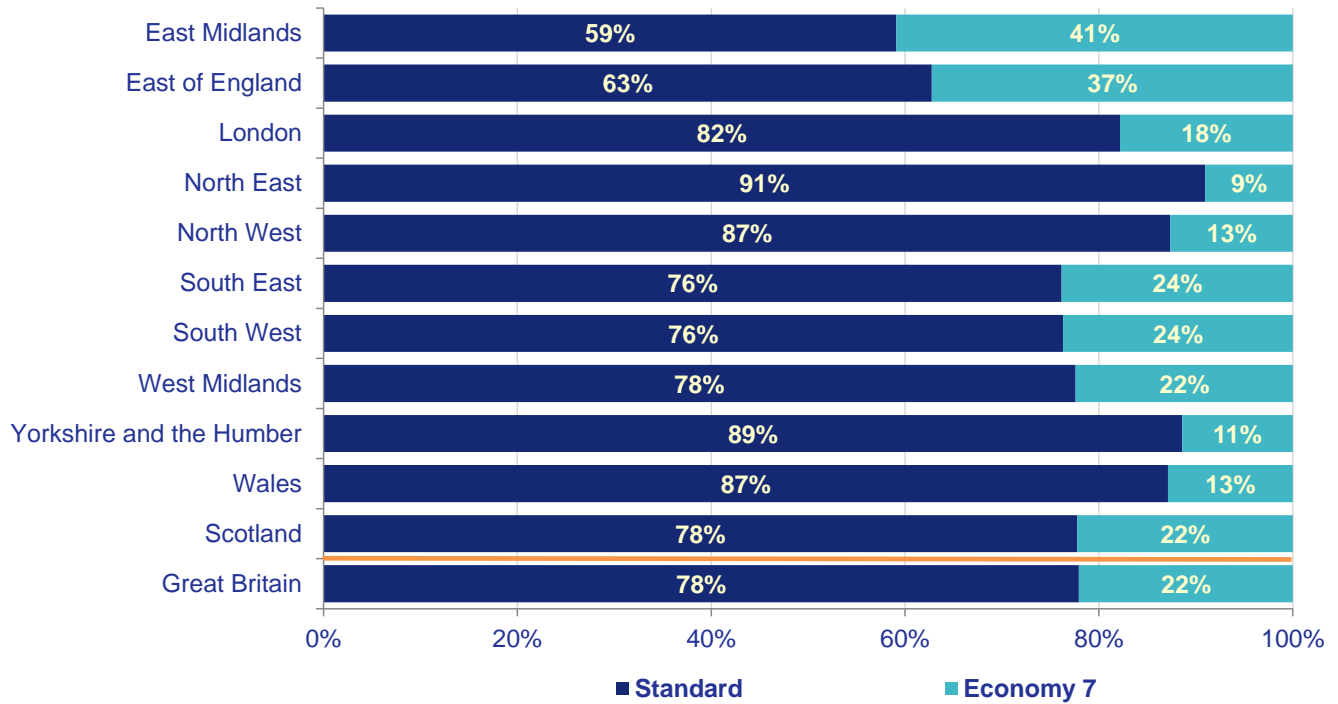
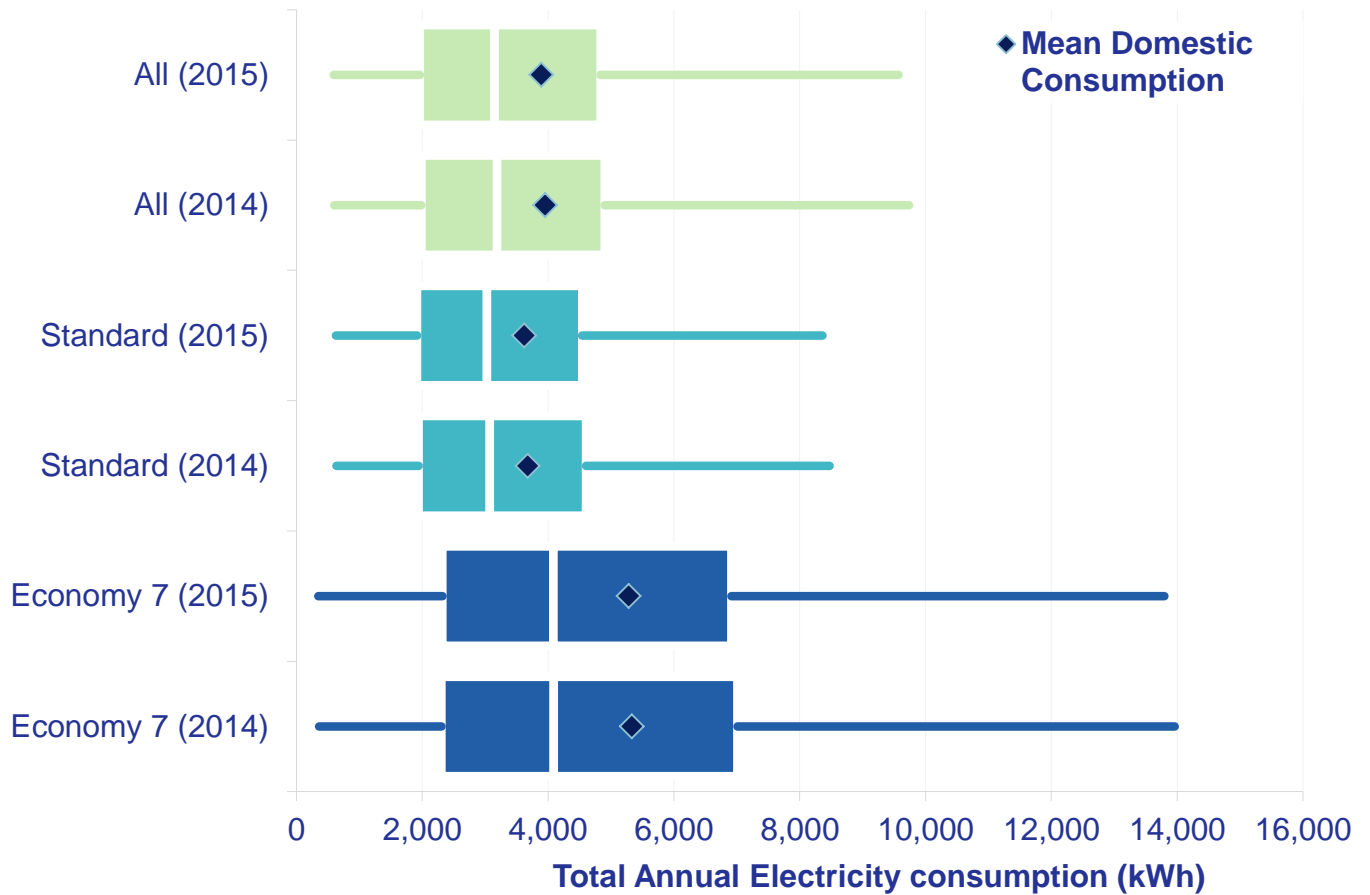


Chart 5 shows box plots illustrating the distribution of domestic consumption for Economy 7 meters, standard meters, and all domestic meters in Great Britain. It is clear that the spread of consumption is much larger for Economy 7 meters, with an interquartile range of 4,706 kWh and 4,593 kWh in 2014 and 2015 respectively; compared with standard meters, which had an interquartile range of 2,660 kWh and 2,622 kWh, in 2014 and 2015.

Chart 5: Box plot of average domestic electricity consumption for Economy 7 and standard meters, 2014 and 2015

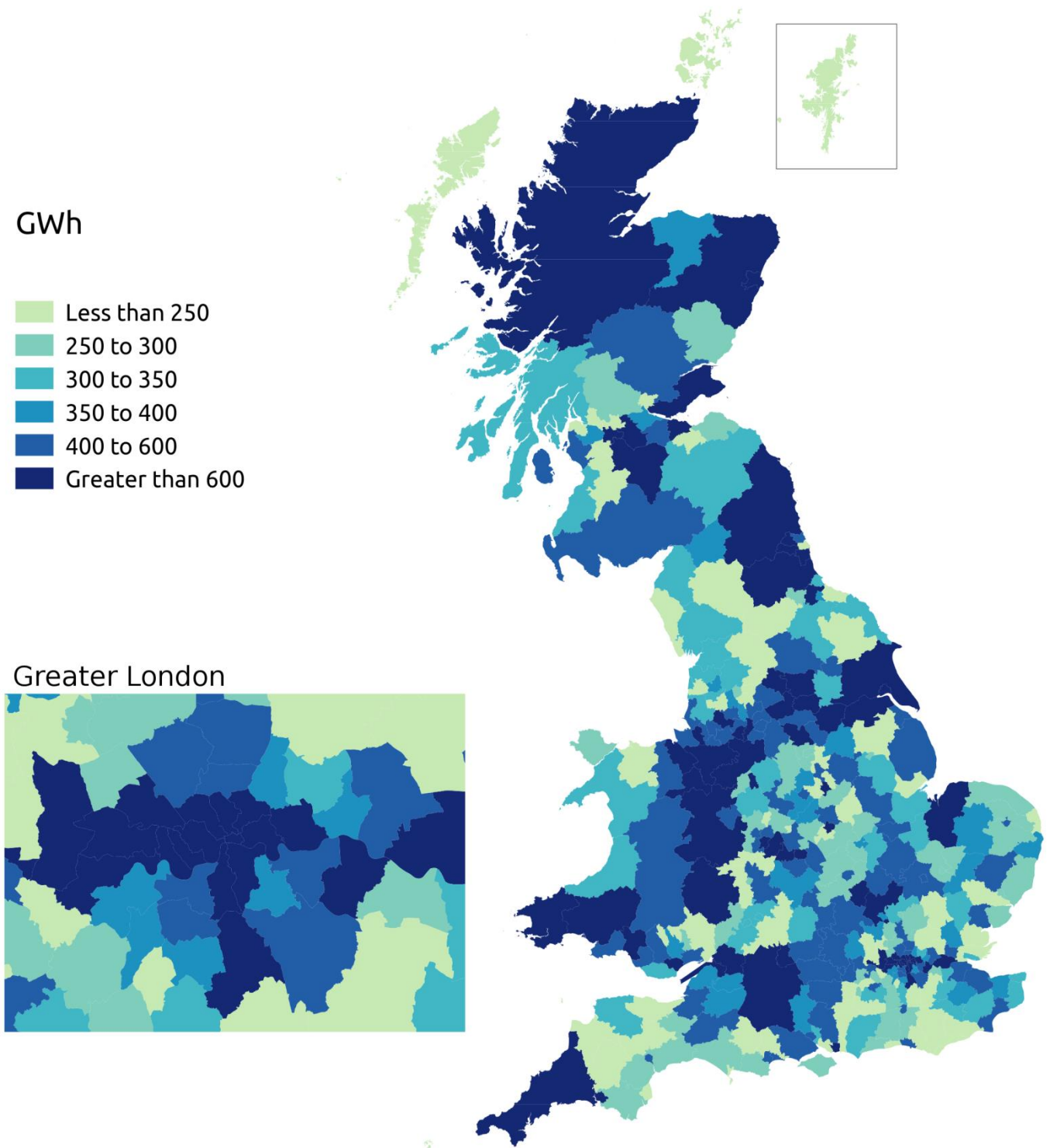


2.3 Non-domestic electricity consumption

Total non-domestic consumption

In 2015, total non-domestic electricity consumption in Great Britain was 184,588 GWh, 0.8 per cent lower than non-domestic consumption in 2014 (186,155 GWh). However, since 2005, non-domestic electricity consumption has decreased by 8.1 percent (16,302 GWh) in Great Britain.

Map 3: Total non-domestic electricity consumption by local authority, 2015



Average non-domestic consumption

In 2015, the mean annual non-domestic electricity consumption per meter, in Great Britain, was 76,771 kWh and the median was 8,674 kWh.

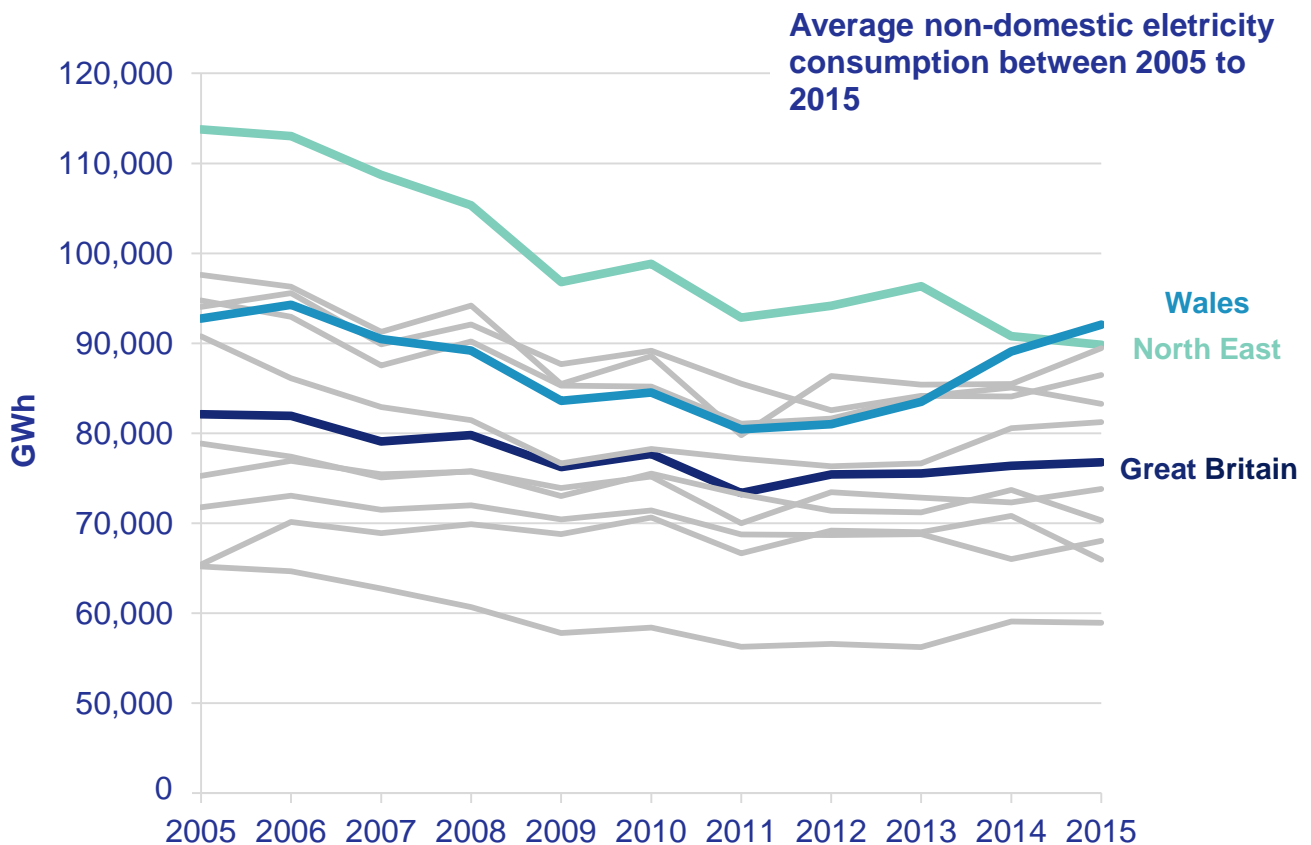
At a local authority level, high average non-domestic consumption can occur where there are a small number of very high consumers which dominate the area (e.g. Neath Port Talbot, Wales) or a more consistently relatively high consuming non-domestic population (e.g. City of London). The mean consumption is also highly influenced by a relatively small number of very high

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consuming meters, which can result in big differences between mean and median consumption in this sector. This is seen in areas like Neath Port Talbot and Stockton-on-Tees where the mean is more than 20 times the median. The City of London had the highest median annual non-domestic consumption of 19.8 MWh, whereas Hammersmith and Fulham had the smallest median annual non-domestic consumption of 3.5 MWh.

The North East had the largest percentage decrease (21.0 per cent) in average non-domestic consumption between 2005 and 2015, with Wales only decreasing by only 0.7 per cent. The energy efficiency of buildings and economic recession will have had an impact on consumption and this will have varied between regions.

Chart 6: Average non-domestic electricity consumption for selected regions, 2005 to 2015



It is important to recognise that when making comparisons between years at local authority level, total and average consumption levels are influenced by changes to establishments in a local authority. This could be because of relocations, new industrial or commercial establishments opening or the closure or downsizing of existing businesses. The impact of these changes on totals and averages is highly dependent on the size of the business. The rate of change of average consumption will be impacted by these factors, particularly since 2008 given the recent recession. Weather conditions have a smaller impact on non-domestic consumption than on household use as less of the energy is used for heating.

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Table 3 shows the average (mean and median) non-domestic electricity consumption per meter in each region.

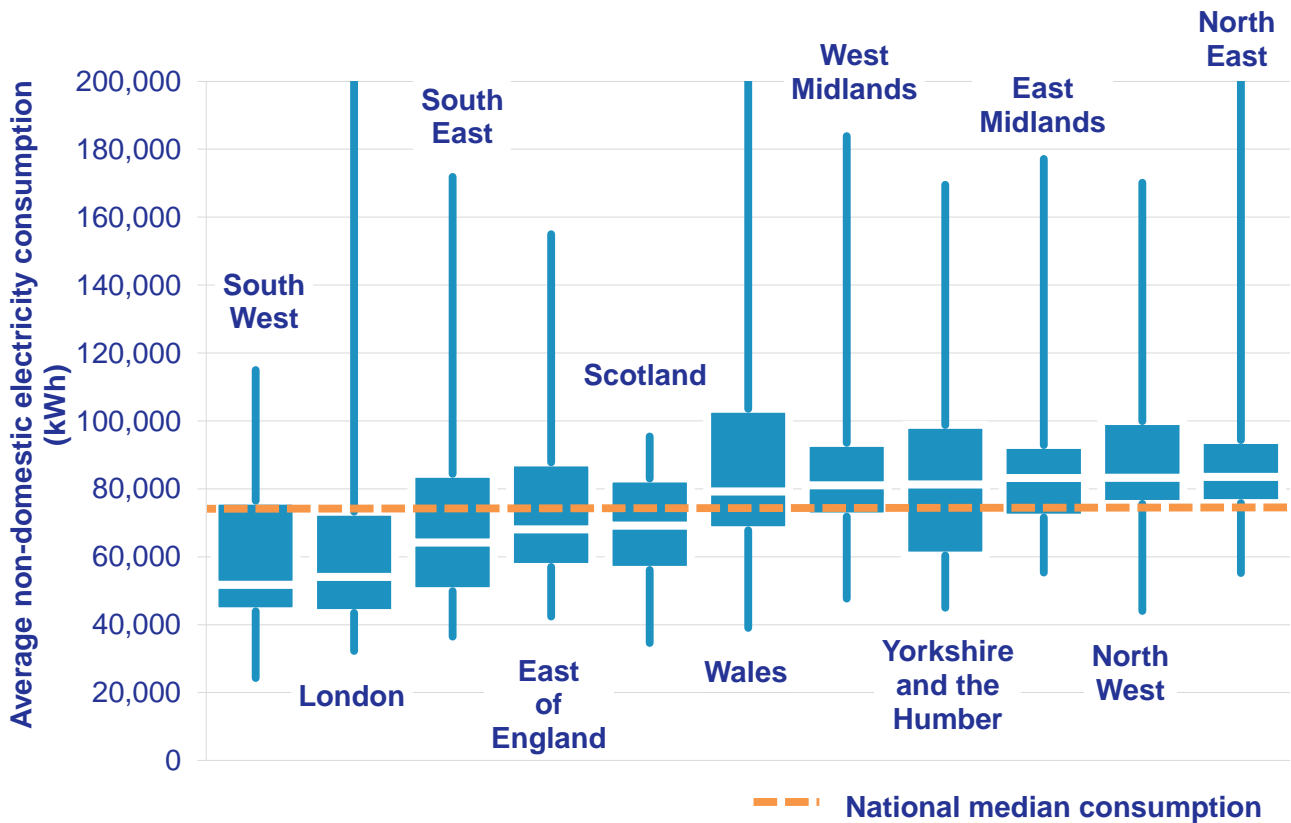
Table 3: Average non-domestic electricity consumption per meter by region, 2015

	All non-domestic meters		
	Mean consumption (kWh)	Median consumption (kWh)	Number of non-domestic meters (thousand)
East Midlands	83,281	10,261	165
East of England	73,814	9,225	221
London	65,962	6,429	404
North East	89,845	8,961	84
North West	89,445	10,438	216
South East	68,033	8,328	342
South West	58,945	7,305	248
West Midlands	81,252	9,527	188
Yorkshire and the Humber	86,463	9,756	176
England	74,332	8,513	2,043
Wales	92,086	7,851	122
Scotland	70,332	9,345	220
Unallocated	196,016	13,457	30
Great Britain	76,771	8,674	2,416

Distribution of non-domestic consumption

Chart 7 provides more information about how mean non-domestic consumption for each local authority varies within region. The box plot shows the minimum, the upper and lower quartile and the median values for the mean electricity consumption in LAs within each region. The maximum is also shown where it is below 200,000 kWh.

Chart 7: Box plot of average non-domestic electricity consumption for local authorities within each region, 2015



The analysis of the electricity meter point data shows that the overall trend in consumption at a national level has continued to follow a general downward trend over the last few years. There are large variations in consumption levels and changes over time at a more local level. These can be seen in more detail in the accompanying data tables at:

<https://www.gov.uk/government/collections/sub-national-electricity-consumption-data>

3. Gas

The data analysed in this document are based on the aggregation of Meter Point Reference Number (MPRN) readings throughout Great Britain obtained as part of BEIS's annual meter point gas data exercise. The estimates for 2015 cover the gas year between 1 October 2014 and 30 September 2015 and are supplied to BEIS as weather corrected data. Estimates presented for 2015 are provisional.

In the domestic sector, gas consumption is predominately used for heating purposes and as a result usage is driven by external temperatures and weather conditions. The weather correction factor enables comparisons of gas use over time, controlling for weather changes. An overview of the weather correction process is available here:

<https://www.gov.uk/government/publications/overview-of-weather-correction-of-gas-industry-consumption-data>.

This section looks at gas consumption by consuming sector (i.e. domestic and non-domestic), and geographic area (region and local authority). To distinguish if a meter reading is domestic or non-domestic, the gas industry cut-off point of 73,200 kWh has been used – that is, if a meter consumes less than 73,200kWh it is defined as a domestic meter, and non-domestic if it consumes 73,200 kWh or more.

The published gas statistics can be found here: <https://www.gov.uk/government/collections/sub-national-gas-consumption-data>.

3.1 Total gas consumption

During 2015, the total annual gas consumption in Great Britain was 489,257 GWh (via 23.7 million meters), 1.3 per cent lower than consumption in 2014 (495,656 GWh). As gas data are weather corrected, this represents a decrease irrespective of weather conditions in the year.

Total consumption decreased in 181 of the 376¹² local authorities between 2014 and 2015. The number of meters in an area can change as new properties are built and old properties demolished. In addition, assigning a meter to an area within the sub-national gas consumption statistics is also dependent upon the address information for each meter. Improvements in address information may allow more meters to be matched to the correct geographic area rather than remaining 'Unallocated'¹³. This means that an increase in the number of meters in an area may reflect better postcode allocation, rather than an actual increase in the number of meters within the year.

¹² The local authorities of Eilean Siar (Western Isles), Orkney Islands, Shetland Islands and Isles of Scilly do not have access to gas.

¹³ 'Unallocated' meters are meters with insufficient address information to assign their consumption to a geographical area

Table 4 shows the changes in gas consumption and number of meters in Great Britain between 2014 and 2015 for each region. It shows that there has been an increase in the number of meters for all regions. This is consistent with the gradual increase seen each year since 2005.

Table 4: Gas consumption in Great Britain by region, 2014 and 2015

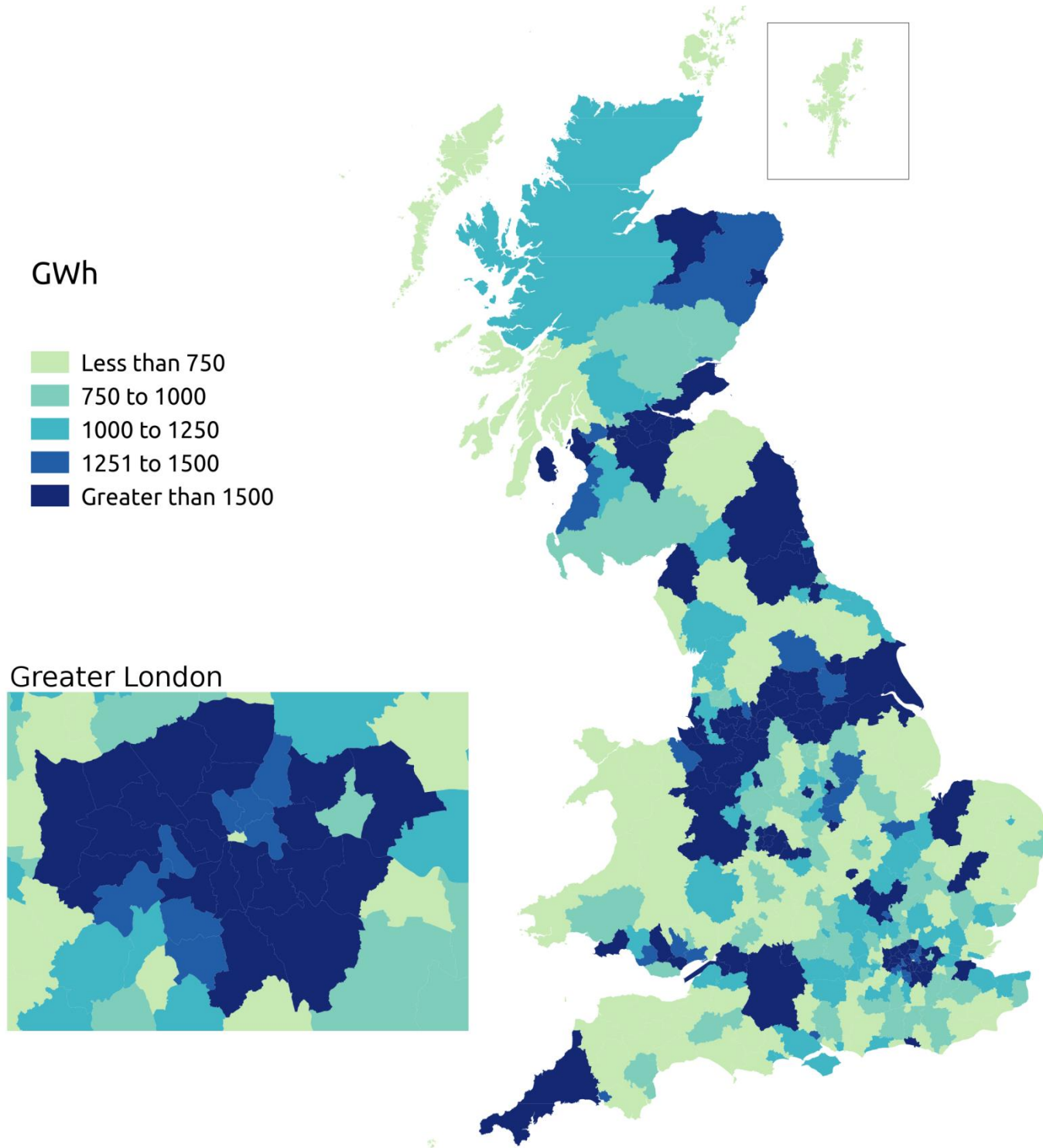
	2014		2015		Percentage Change	
	Total annual gas consumption (GWh)	Number of meters (thousand)	Total annual gas consumption (GWh)	Number of meters (thousand)	Total annual gas consumption (GWh)	Number of meters (thousand)
East Midlands	37,099	1,774	36,850	1,792	-0.7%	1.0%
East of England	41,698	2,071	42,052	2,089	0.8%	0.8%
London	59,102	3,040	58,439	3,045	-1.1%	0.2%
North East	22,379	1,105	22,368	1,113	-0.1%	0.7%
North West	61,205	2,914	60,287	2,930	-1.5%	0.6%
South East	59,769	3,213	59,856	3,236	0.1%	0.7%
South West	32,207	1,850	31,360	1,868	-2.6%	1.0%
West Midlands	43,705	2,119	43,935	2,134	0.5%	0.7%
Yorkshire and the Humber	48,601	2,132	48,274	2,144	-0.7%	0.6%
England	405,766	20,220	403,421	20,352	-0.6%	0.7%
Wales	22,132	1,118	22,045	1,125	-0.4%	0.7%
Scotland	46,294	1,997	45,339	2,016	-2.1%	1.0%
Unallocated ¹	21,465	171	18,452	171	-14.0%	0.0%
Great Britain	495,656	23,505	489,257	23,662	-1.3%	0.7%

A small number of meters in Great Britain, cannot be described as being in a specific area (0.7 per cent). These meters are therefore categorised as 'Unallocated'.

Total consumption of gas fell in eight of the 11 regions between 2014 and 2015, with the largest decline (-2.6 per cent) in the South West. The largest increase was in the East of England, where consumption grew by 0.8 per cent. In Great Britain as a whole, there was an overall decrease in consumption of 1.3 per cent.

In 2015, the City of London had the highest local authority mean gas consumption at 223,562 kWh, compared with Torrridge (South West) with the lowest mean gas consumption at 12,490 kWh. This reflects the different compositions of these areas, with the City of London having a far higher concentration of large business consumers.

Map 4: Total annual gas consumption by local authority 2015



3.2 Domestic gas consumption

Average domestic gas consumption

The mean and median annual gas consumption per domestic meter in 2015 were 13,202 kWh and 11,707 kWh respectively, with a total domestic gas consumption of 308,749 GWh. Mean domestic consumption was lower than in 2014, by 0.3 per cent.¹⁴ Total consumption however was up by 0.3 per cent, as the fall in the mean was outweighed by a 0.7 per cent increase in the number of homes consuming gas.

Table 5 shows the average (mean) domestic gas consumption per meter, the total number of domestic meters, total domestic consumption for each region and the median domestic consumption in 2015.

Table 5: Mean domestic gas consumption per meter by region, 2015

	Number of domestic meters (thousands)	Total domestic consumption (GWh)	Mean domestic consumption (kWh)	Median domestic consumption (kWh)
East Midlands	1,774	23,771	13,401	12,142
East of England	2,068	27,902	13,493	12,012
London	3,006	40,014	13,312	11,358
North East	1,103	14,738	13,367	12,252
North West	2,901	37,278	12,849	11,514
South East	3,199	43,891	13,722	11,988
South West	1,850	21,577	11,666	10,224
West Midlands	2,111	27,847	13,190	11,921
Yorkshire and the Humber	2,121	28,923	13,636	12,264
England	20,132	265,941	13,210	11,721
Wales	1,116	13,682	12,264	11,142
Scotland	1,994	27,124	13,657	12,029
Unallocated ¹	153	2,002	13,049	9,978
Great Britain	23,395	308,749	13,202	11,707

¹ A small number of meters in Great Britain, cannot be described as being in a specific area (0.7 per cent). These meters are therefore categorised as 'Unallocated'.

The South East had the highest mean domestic consumption with 13,722 kWh per meter (median consumption of 11,988 kWh), with the South West having the lowest at 11,666 kWh per meter.

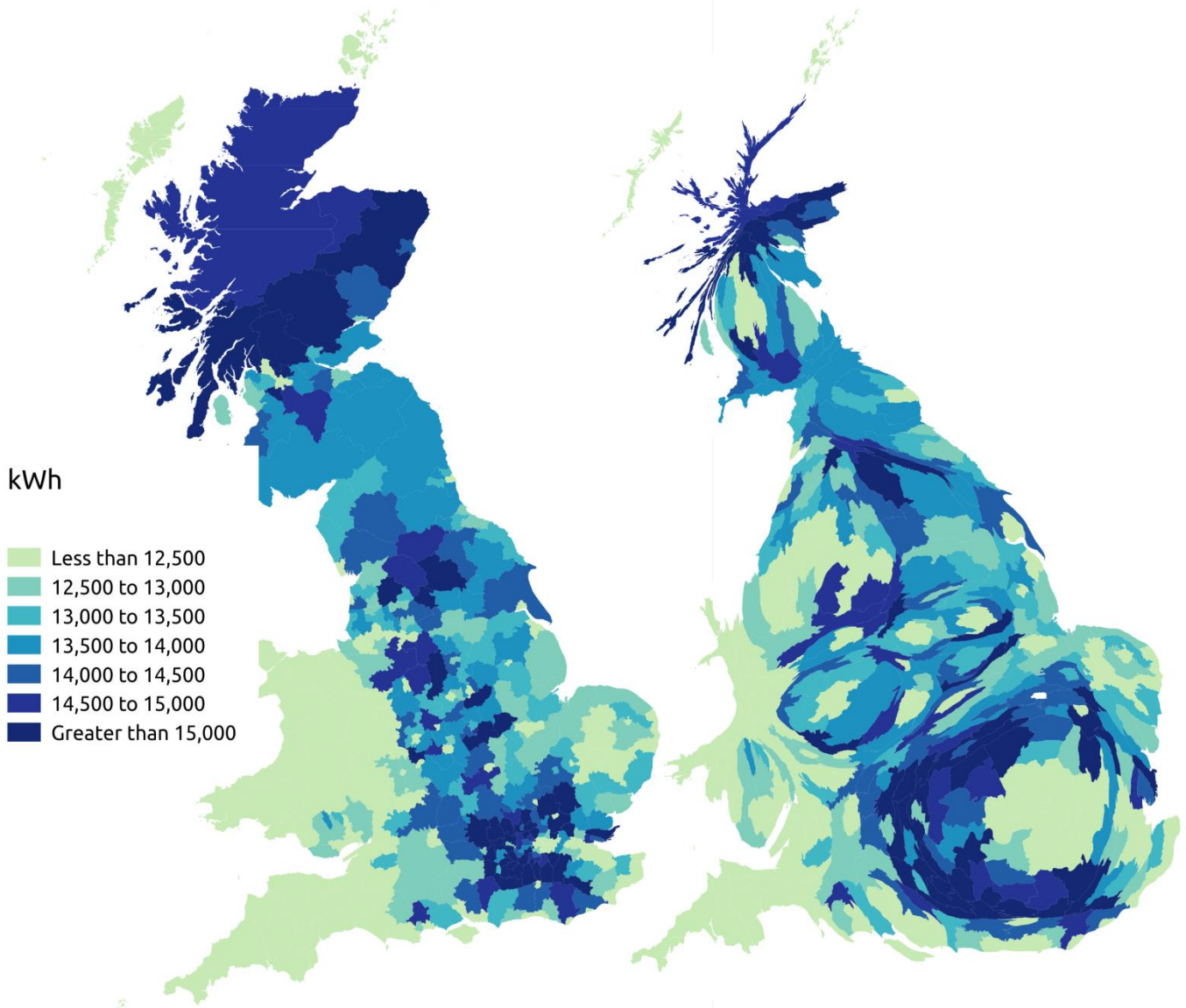
In terms of total domestic gas consumption for Great Britain, the South East consumed 14.2 per cent of all domestic gas, followed by London (13.0 per cent) and the North West (12.1 per cent). The North East and Wales consumed the least; 4.8 and 4.4 per cent respectively.

¹⁴ The sub-national data is weather corrected, however unadjusted domestic gas consumption estimates are available in Table 3.03 of Energy Consumption in the UK (ECUK): <https://www.gov.uk/government/collections/energy-consumption-in-the-uk>. Estimates in Table 3.03 show a increase in overall domestic consumption between 2014 and 2015 (from 278,101 GWh to 292,417 GWh) and average consumption (from 12,404 kWh to 12,962kWh).

Map 5, shows average (mean) domestic gas consumption per meter by local authority in 2015. South Bucks (South East) had the highest mean gas consumption in 2015 at 19,440 kWh compared with the lowest in Tower Hamlets (London) at 9,115 kWh.

In the map below, known as a cartogram, the size of each local authority area has been adjusted according to its population. This can help interpretation as it prevents densely populated areas being underrepresented. For example, London accounts for 15 per cent of England's population, but only 1.2 per cent of land area; the cartogram expands the area of London to account for this.

Map 5: Average domestic gas consumption per meter by local authority, 2015



Mean domestic gas consumption per meter in Great Britain decreased by 30.6 per cent between 2005 and 2015. There are a number of factors which may have contributed to the reductions in consumption, including; weather conditions, energy efficiency improvements¹⁵, such as increased levels of insulation, new boilers and more energy efficient appliances; increased prices¹⁶ and the recession; and changes in the building stock and household composition.

Chart 8 shows the decrease in average domestic gas consumption per meter point between 2005 and 2015 at regional level. Mean domestic consumption in 2015 was lower than 2014 in all but two regions: the South East and London.

Chart 8: Decrease in average domestic consumption per meter point between 2005 and 2015, and between 2014 and 2015



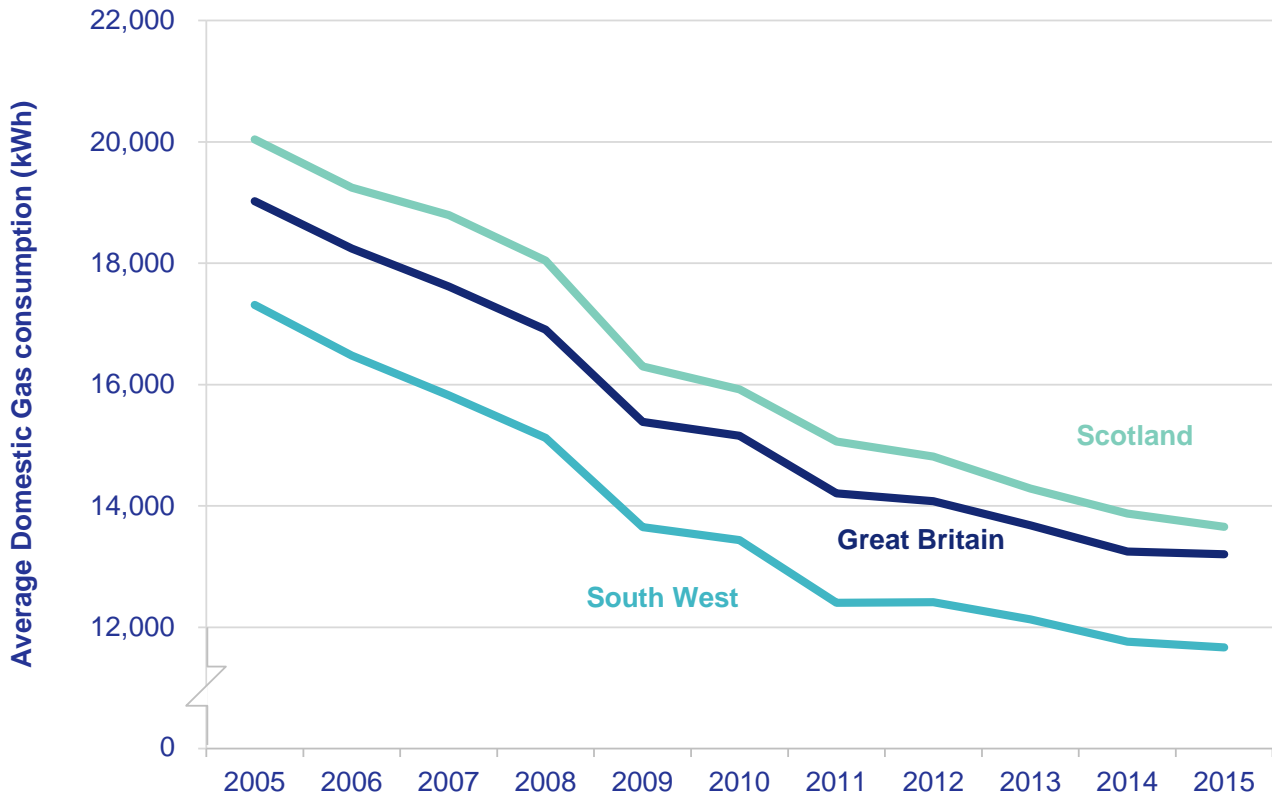
Chart 9 shows the mean domestic gas consumption per meter for Scotland, the South West and Great Britain between 2005 and 2015. These regions have been selected as they had the highest and lowest average domestic gas consumption for each of the seven years. The

¹⁵ The energy efficiency of the housing stock improved between 2005 and 2014, the average SAP rating of a dwelling increased by 11.0 points from 49.4 to 60.9. The SAP rating is a measure of the overall energy efficiency of the dwelling. Table 13: English Housing Survey Headline Report 2014-15: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/501065/EHS_Headline_report_2014-15.pdf.

¹⁶ Between 2005 and 2015, domestic gas prices contained in Quarterly Energy Prices show an increase of more than 100 per cent (81.3 per cent in real terms) which is likely to have influenced demand. 'Quarterly Energy Prices' can be accessed here: <https://www.gov.uk/government/statistics/quarterly-energy-prices-september-2016>

average consumption for all other regions in Great Britain was between the lines shown for Scotland and the South West and all regions followed a similar trend.

Chart 9: Mean domestic gas consumption for selected regions, 2005 to 2015

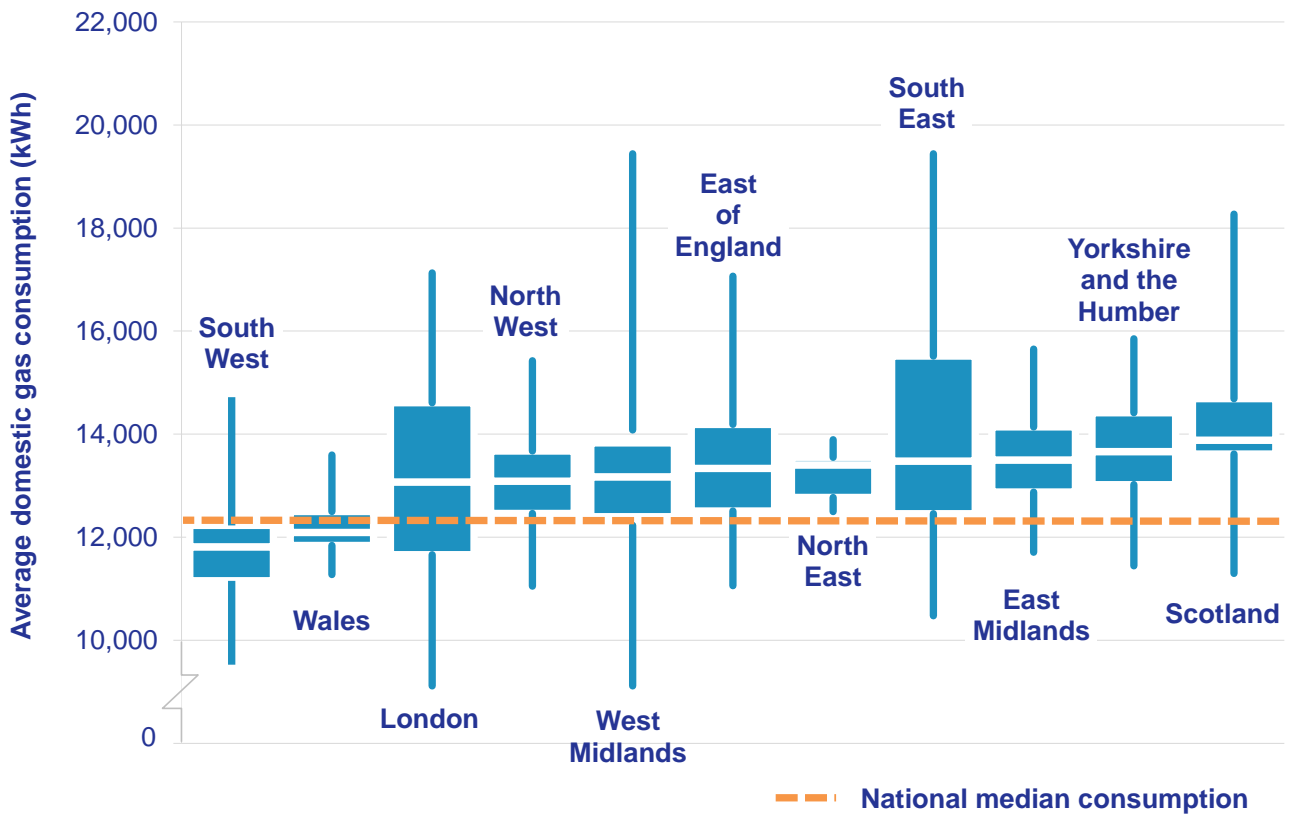


Distribution of domestic consumption

Chart 10 shows a series of box plots illustrating the distribution of average domestic gas consumption for local authorities within each region as well as a box plot for Great Britain. These have been calculated based on average (mean) consumption for each local authority within each region. The spread (inter-quartile range) between the upper (Q3) and lower (Q1) quartiles (that is, the middle 50 per cent of the data), of average domestic gas consumption in local authorities was greatest in the South East (a difference of 3,058 kWh per meter), whereas the inter-quartile range for the Wales was 659 kWh, as indicated by the shorter box.

The whiskers in the chart represent the highest and lowest mean in each region. The local authority with minimum average domestic consumption varies within each region from 9,115 kWh (Tower Hamlets) in London to 12,498 kWh (South Tyneside) in the North East. The largest average domestic consumption per meter varies from 13,595 kWh (Merthyr Tydfil) in Wales to 19,440 kWh (South Bucks) in the South East.

Chart 10: Box plot of mean domestic gas consumption for local authorities within each region, 2015



3.3 Non-domestic gas consumption

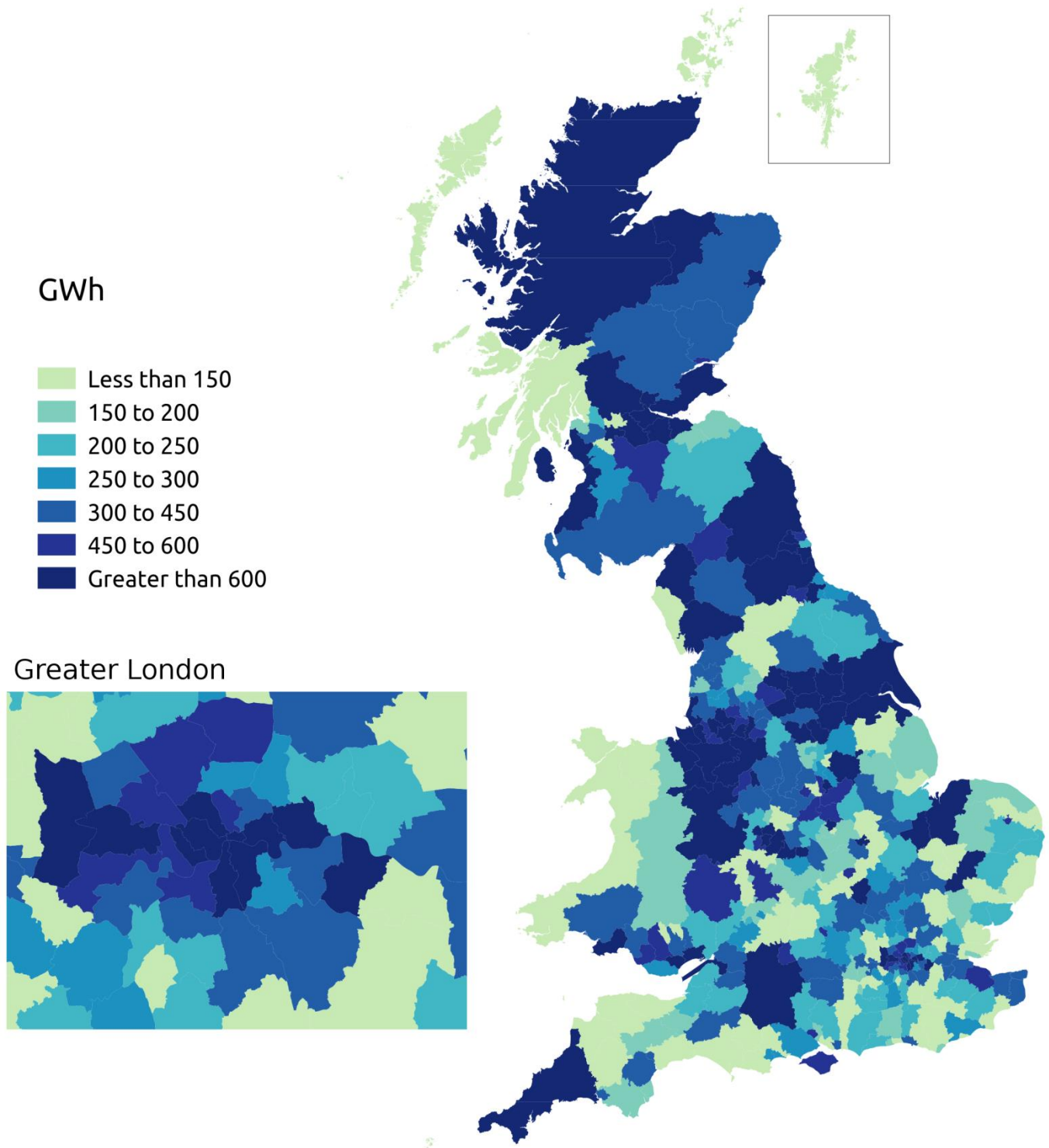
Total non-domestic consumption

In 2015, total non-domestic annual gas consumption in Great Britain was 180,508 GWh (via 267,424 meters), 3.9 per cent lower than consumption in 2014 (187,824 GWh).

Non-domestic consumption decreased in 209 local authority areas¹⁷ between 2014 and 2015.

¹⁷ The local authorities of Eilean Siar (Western Isles), Orkney Islands, Shetland Islands and Isles of Scilly are not included in the sub-national gas consumption datasets due to limitations in access to gas.

Map 6: Total non-domestic gas consumption by local authority, 2015



Average non-domestic consumption

Average annual non-domestic gas consumption per meter was 675,257 kWh in 2015, 4.3 per cent lower than in 2014 (705,903 kWh).

Table 6 shows the average (mean) non-domestic gas consumption per meter and total non-domestic consumption in each of the regions. The North West accounted for 12.7 per cent of all non-domestic gas consumption, compared to the North East and Wales which consumed 4.2 and 4.6 per cent respectively. Wales, Yorkshire and the Humber and Scotland had the highest average non-domestic consumptions, reflecting the mix of industry in the regions, and the

greater use of gas for industrial purposes. The South East and London are more service sector orientated and had the lowest mean non-domestic consumption in 2015.

Table 6: Average non-domestic gas consumption per meter and total non-domestic gas consumption by region, 2015

	Number of non-domestic meters (thousands)	Total non-domestic consumption (GWh)	Average non-domestic consumption (kWh)
East Midlands	18	13,079	727,510
East of England	21	14,150	674,752
London	40	18,425	465,873
North East	11	7,630	719,528
North West	29	23,008	792,322
South East	38	15,965	424,380
South West	19	9,783	522,612
West Midlands	22	16,088	717,513
Yorkshire and the Humber	23	19,351	846,979
England	220	137,480	625,618
Wales	9	8,363	882,887
Scotland	23	18,216	811,816
Unallocated ¹	16	16,450	1,050,609
Great Britain	267	180,508	675,257

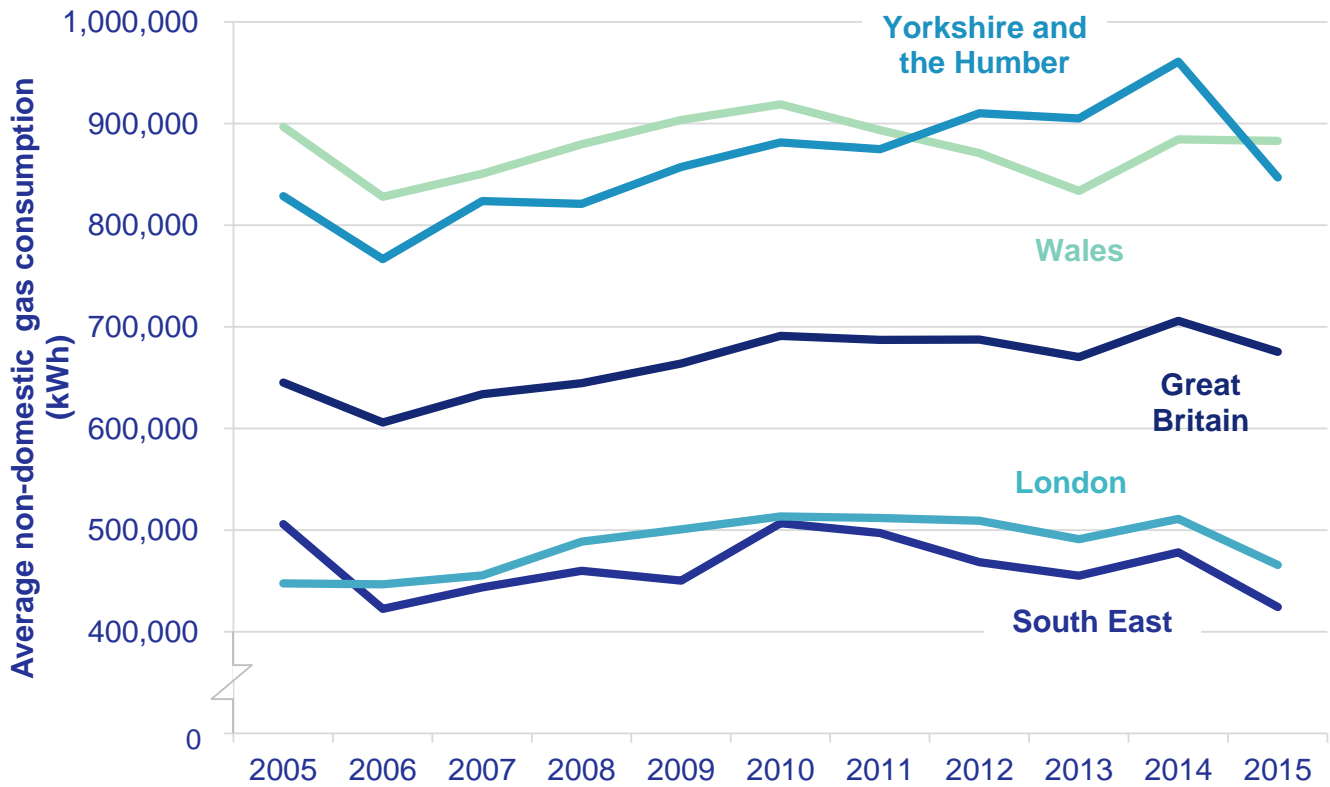
¹ A small number of meters in Great Britain, cannot be described as being in a specific area (0.7 per cent). These meters are therefore categorised as 'Unallocated'.

Chart 11 shows the trends in mean non-domestic gas consumption for Yorkshire and the Humber, Wales, London, the South East, and Great Britain as a whole. In comparison to domestic gas consumption, different trends can be seen for the average annual non-domestic gas consumption between 2005 and 2015 and also between 2014 and 2015.

Between 2014 and 2015 all of the regions saw a reduction in average consumption per non-domestic gas meter, ranging from 0.2 per cent in Wales, to 13.6 per cent in the South West.

At a local authority level, King's Lynn (East England) had the highest mean gas consumption in 2015 at 4,879,537 kWh compared with 200,370 kWh in Elmbridge (South West), which had the lowest mean.

Chart 11: Average non-domestic gas consumption for selected regions, 2005 to 2015

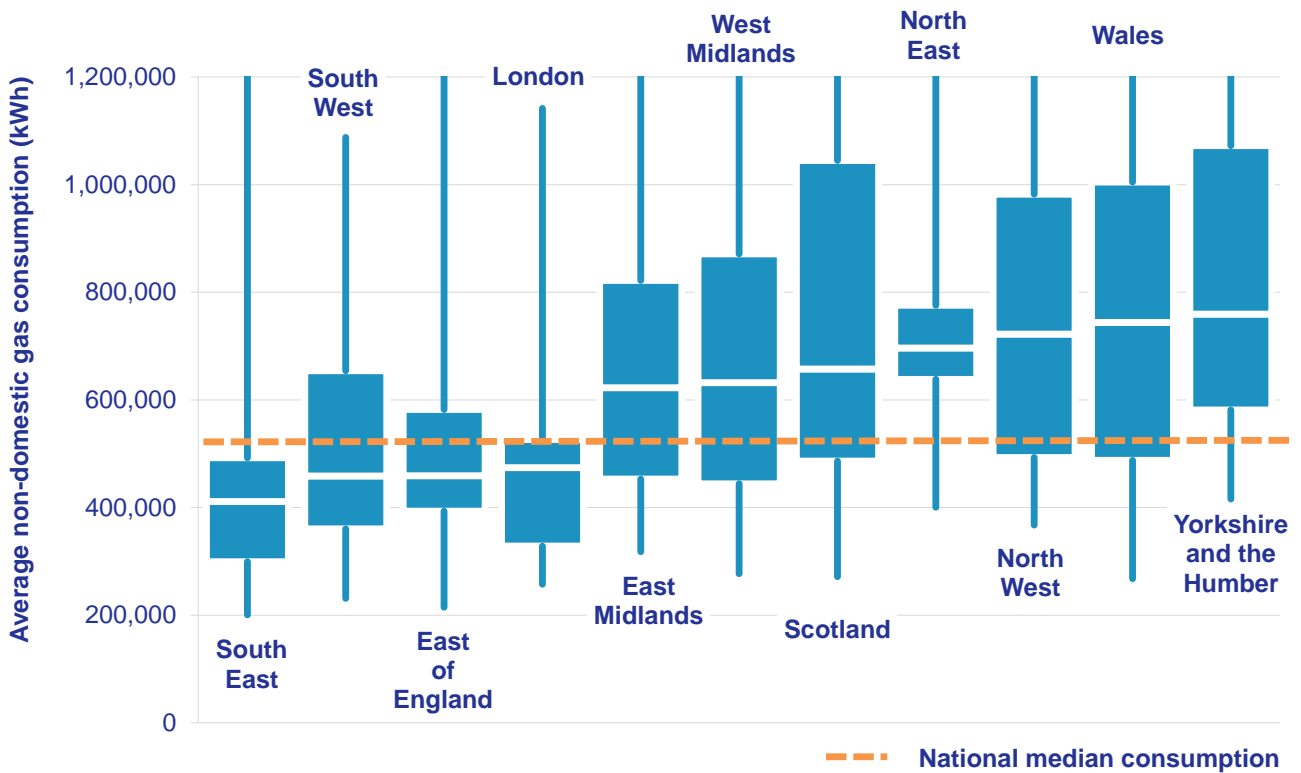


Distribution of non-domestic consumption

Chart 12 shows a box plot displaying aspects of the distribution of average non-domestic gas consumption for local authorities for each of the regions, as well as one for local authorities in Great Britain as a whole. For each region, the box plot shows the minimum average (mean) non-domestic gas consumption, the upper and lower quartile and the median average gas consumption. The maximum average non-domestic gas consumption values have been included, however due to their magnitude, many of these continue beyond the chart shown below – these have been excluded to provide a clearer view of the rest of the distribution.

From the chart it can be seen that the inter-quartile range of average gas consumption in local authorities was greatest in Scotland (559 MWh), whereas the North East had the smallest spread (137 MWh) of average non-domestic gas consumption per local authority, reflecting the difference and similarities in businesses in the areas respectively. The degree of variability between regions is much greater for non-domestic consumption than domestic.

Chart 12: Box plot of average non-domestic gas consumption for local authorities within each region



3.4 Number of households not connected to the gas grid

Background

There is no definitive source of information on households that are off the gas grid. However, BEIS produces estimates of the number of households without gas based on the difference between the number of gas meters in each area, as set out earlier in this document, and the number of households in each area¹⁸. These estimates were published for the first time in December 2013.

The published data does not allow the identification of specific households within an area which are off the gas grid, but does allow small geographic areas which have few or no gas meters to be identified. However there are a number of limitations which should be considered when using these estimates:

- Each gas meter is assigned as domestic or non-domestic based on the gas industry threshold of 73,200kWh, with all meters with consumption below 73,200 kWh assumed to be domestic. This means a number of smaller commercial/industrial consumers are allocated as domestic and therefore estimates of the number of households without gas

¹⁸ For the purposes of this work household estimates are taken from the 2011 census to allow consistency with the LSOA and MSOA estimates.

are an underestimate of the true number. The impact of this assumption on estimates will vary by area.

- Some meters cannot be allocated to a local authority due to insufficient or incomplete address information¹⁹. Approximately 0.7 per cent of domestic meters could not be allocated to a local authority in 2015.
- In some cases incorrect address information may mean meters are allocated to the wrong area. The number of meters which are incorrectly allocated will vary by area.
- In this dataset, there is no differentiation between properties which do not have a gas meter because they are in an area which is off the gas grid and those which are in an area on the gas grid but have a property which is not connected to it (such as inner city blocks of flats).
- For these estimates it is assumed that each property always has one gas meter. Occasionally a property may have more than one gas meter, which would again mean the estimates provided are an underestimate of the true value.
- Data refer to the data collection during 2015 and therefore does not include any changes which may have occurred since 2015.

Estimates of households not connected to the gas grid

Table 7 below shows the estimated proportion and number of households that are not connected to the gas network in each region of Great Britain.

Approximately 9.1 per cent of households in Great Britain are not connected to the gas grid; however the proportions vary across each region. The South West and Scotland had the highest proportion of properties without a gas meter (18.3 per cent and 16.0 per cent respectively). The North East and North West have the lowest with 2.4 and 3.6 per cent of households not connected to the gas network.

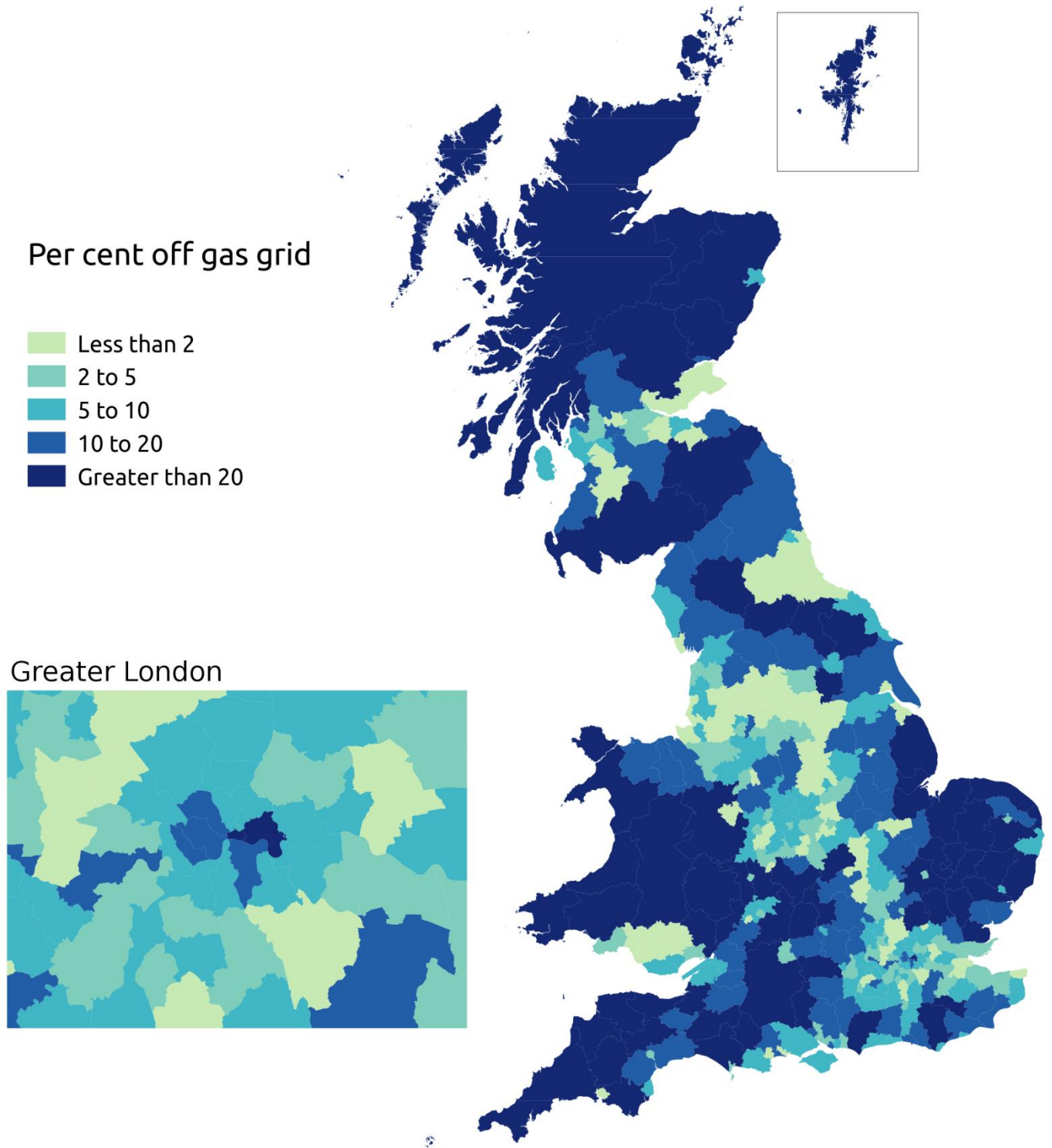
¹⁹ These meters are included in the overall estimates for Great Britain, but are aggregated in the 'Unallocated' row in the sub-national statistics outputs.

Table 7: Estimated proportion of households not connected to the gas network using 2011 Census data, by region (2015)

	Number of domestic gas meters (thousands)	Number of households as in 2011 Census (thousands)	Estimated number of "off gas" households (thousands)	Estimated proportion of "off gas" households
East Midlands	1,774	1,896	122	6.4%
East of England	2,068	2,423	355	14.7%
London	3,006	3,266	260	8.0%
North East	1,103	1,130	27	2.4%
North West	2,901	3,010	109	3.6%
South East	3,199	3,555	356	10.0%
South West	1,850	2,265	415	18.3%
West Midlands	2,111	2,295	184	8.0%
Yorkshire and the Humber	2,121	2,224	103	4.6%
England	20,132	22,063	1,931	8.8%
Wales	1,116	1,303	187	14.4%
Scotland	1,994	2,373	379	16.0%
Unallocated ¹	153	-		
Great Britain	23,395	25,739	2,344	9.1%

Map 7 shows how the proportion of properties without a gas meter varies across local authorities in Great Britain.

Map 7: Percentage of meters that are off the gas grid by local authority, 2015



Estimates for local authority (2015 data) have been published at:

<https://www.gov.uk/government/collections/sub-national-gas-consumption-data>.

Estimates for lower level super output area (2015 data) will also be available from this link from 26 January 2017.

BEIS have also published an interactive map which displays the distance of off gas properties from the gas network using information on the location of off gas properties and the location of the gas network infrastructure. The map can be accessed here:

<https://www.nongasmap.org.uk/>

4. Super output area estimates

4.1 Background

Gas and electricity consumption data are also available at lower layer super output area (LSOA) and middle layer super output area (MSOA). These are statistical geographies developed for the Census (England and Wales) and designed to improve the reporting of small area statistics. They are built up from groups of output areas²⁰. Data for Scotland are also published for intermediate geographies (equivalent to MSOAs). BEIS is also looking at the potential to publish estimates for Scottish Data Zones (equivalent to LSOAs) in future.

There are 34,753 LSOAs in England and Wales with a minimum population of 1,000 (or around 400 households). MSOAs are formed from groupings of LSOAs²¹ and there are 7,201 MSOAs in England and Wales, with a minimum population of 5,000 people (or 2,000 households). The intermediate geography zones (IGZ) used in Scotland are aggregations of data zones within local authorities and are slightly smaller than MSOAs, containing between 2,500 and 6,000 people²².

Gas and electricity estimates for 2011 and later are based on 2011 Census geographies. Data prior to 2011 are based on the 2001 Census boundaries²³. Estimates for 2015 will be published on 26 January 2017 and can be accessed at: <https://www.gov.uk/government/collections/sub-national-electricity-consumption-data> (electricity) and <https://www.gov.uk/government/collections/sub-national-gas-consumption-data> (gas).

4.2 Published datasets

Middle layer super output area (MSOA) and intermediate geography zone (IGZ)

The MSOA/IGZ datasets include annual consumption (in kWh), the number of meters and the average consumption per meter (in kWh) for each MSOA/IGZ in Great Britain²⁴. Local authority codes and names are also provided.

²⁰ Output Areas are built from clusters of adjacent unit postcodes. They were designed to have similar population sizes and be as socially homogenous as possible based on tenure of household and dwelling type (homogeneity was not used as a factor in Scotland).

²¹ For an illustration of LSOAs within an MSOA please see Annex D.

²² Further information about England and Wales or Scotland's statistical geographies can be accessed at:

<http://www.ons.gov.uk/ons/guide-method/geography/beginner-s-guide/census/super-output-areas--soas/index.html>

<http://www.scotland.gov.uk/Publications/2005/02/20697/52626>.

²³ Conversion files for 2001 to 2011 Census boundary codes are available at the following links:

[Lower layer super output areas \(2001\) to lower layer super output areas \(2011\) to local authority districts \(2011\) E+W lookup.zip](#)

and [Middle layer super output areas \(2001\) to middle layer super output areas \(2011\)](#)

[to local authority districts \(2011\) E+W lookup.zip](#)

²⁴ Some MSOA/IGZ areas may not have access to gas and these areas will have a zero consumption within the sub-national gas consumption datasets. Further information about households with limited access to gas can be found in Section 3.4 of this factsheet.

The published spreadsheets cover the following four sectors:

1. **Domestic gas estimates** - A domestic gas user is defined as a user with an annual consumption of less than 73,200 kWh, which is the gas industry cut-off point for domestic users. It is recognised that this level of consumption will include some non-domestic users.
2. **Domestic electricity estimates** – including a split by domestic ordinary and Economy 7 meters.
3. **Non-domestic gas estimates** - A non-domestic user is defined as a user with an annual consumption of 73,200 kWh or more.
4. **Non-domestic electricity estimates** – The data at MSOA level excludes half hourly meters. This is to avoid data disclosure issues, as these consumers are generally very large energy users and the potential risk of disclosure is high if they are included in the low level datasets. The spreadsheet does contain half-hourly consumption values at a local authority level.

Lower layer super output area (LSOA) and Data zones (DZs)

Similar to MSOA spreadsheets, the LSOA spreadsheets also publish annual consumption (kWh), the number of meters and average consumption for domestic consumers (again split by standard tariff and Economy 7 tariff for electricity) in each LSOA in England and Wales.

The two available datasets at an LSOA level are:

1. **Domestic gas estimates;** and
2. **Domestic electricity estimates.**

Due to disclosure, BEIS are only able to publish the gas and electricity LSOA consumption data for domestic consumers in England and Wales. The LSOA dataset does not contain information for the following:

- **Non-domestic consumption** - Due to the small size of these geographical areas, the majority of LSOAs would have such a small number of non-domestic consumers that the non-domestic consumption would be disclosive and would have to be aggregated. Since the non-domestic consumption is available at an MSOA level, BEIS took the decision that publishing LSOA level data after aggregation would not add much value for users.
- **Scotland** - The gas and electricity consumption data at a Data Zone (DZ) level is currently not available for Scotland as the 6,505 Data Zones each have a minimum population of 500 and publishing at a lower level would risk breaching disclosure agreements (particularly for gas). However BEIS is investigating the value of publishing these data even with a high proportion of merged areas.

Estimates of households not connected to the gas network at LSOA/IGZ level

Also available at an LSOA level are estimates of households not connected to the gas network. These can be accessed here: <https://www.gov.uk/government/collections/sub-national-gas-consumption-data>.

These estimates are based on the same methodology as used for the Local Authority estimates, but with population estimates taken from the 2011 Census. Limitations with the data outlined in section 3.4 will be accentuated in these smaller geographic areas.

5. Comparison with other sources

5.1 Electricity

Estimated total electricity consumption from the meter point data differs from Chapter 5 of the Digest of UK Energy Statistics (DUKES) as DUKES data are based on sales information collected from two separate annual surveys, one of major power producers and one of electricity suppliers²⁵. It is recommended for DUKES data to be used for headline analysis, and sub-national data to be used for regional analysis.

Table 8 below compares the total consumption based on meter points to the corresponding DUKES total.

Table 8: Comparison with published UK statistics for 2015

Total final consumption (UK)	GWh	
Great Britain total consumption from meter point data		
Domestic	107,567	
Non-domestic	184,588	
	<u>292,155</u>	
Implied UK total consumption		
Great Britain total consumption (above)	292,155	
Plus Northern Ireland ¹	3,738	
Plus Sales direct from high voltage lines (based on C	3,879	
Implied UK sales of electricity	<u>299,772</u>	
DUKES total UK sales (DUKES 2016 Table 5.4)	<u>289,337</u>	
Statistical difference	- 10,435	-4% of UK sales

¹ Northern Ireland data are based on data for electricity distributed provided by Northern Ireland Electricity.

² Based on estimates provided by Ofgem.

After taking into account consumption not included in the sub-national estimates (total consumption for Northern Ireland and sales from high voltage lines) there was a statistical difference of 10,435 GWh, -4 per cent of total UK sales reported in DUKES.

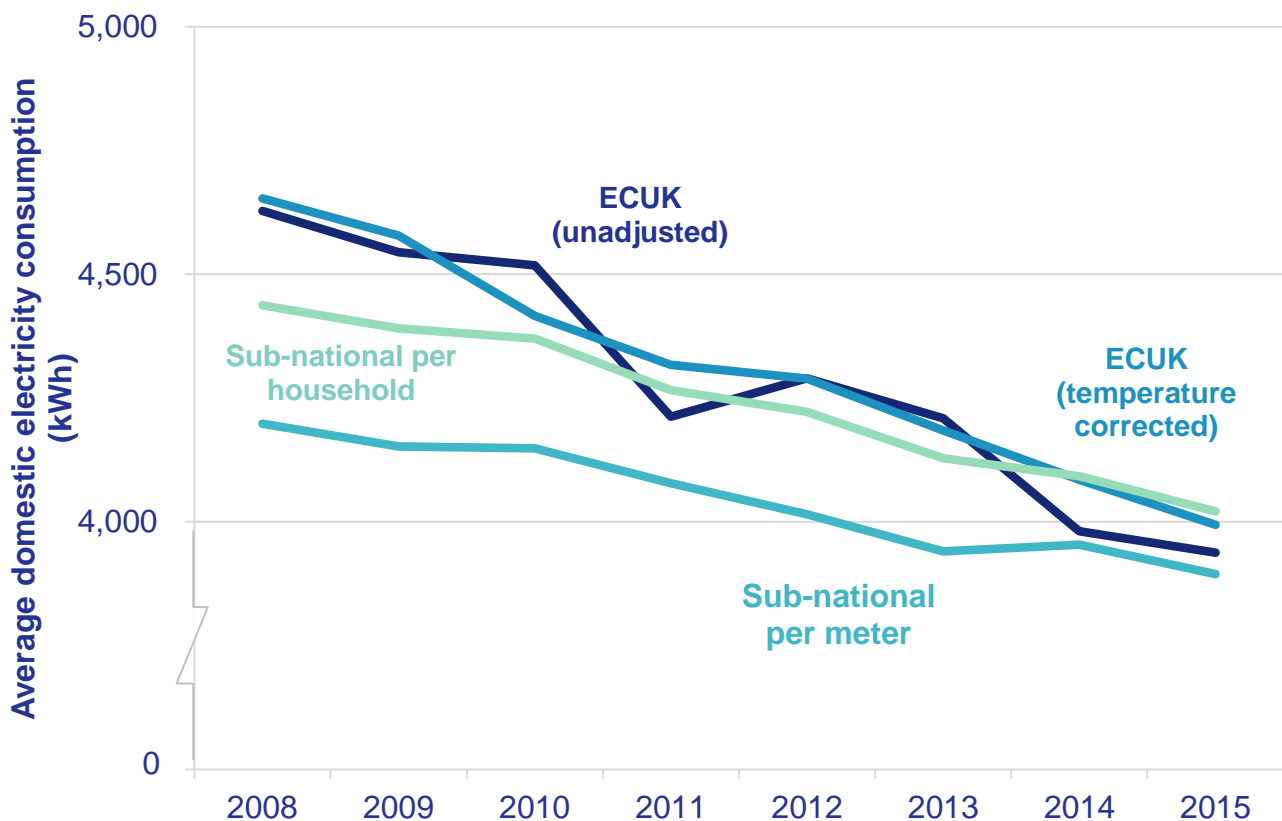
One of the main factors behind this difference is that the non-half hourly data covers the period from the start of February 2015 to the end of January 2016 and not the calendar year 2015 as covered by DUKES. Some of this difference may also be explained by the fact that

²⁵ Detailed electricity figures available in DUKES can be accessed here: <https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/electricity-statistics>.

approximately 10 per cent of the data in the sub-national exercise are based on estimated rather than actual meter readings, and some further meters will have been estimated by suppliers. Therefore the sub-national totals may not reflect the full scale of changes in consumption between years.

A comparison with the average annual consumption per household published in Energy Consumption in the UK (ECUK) Table 3.07 (and based on data from DUKES Table 1.1.5) also shows that the trend over time is consistent for the two sources, see Chart 13.

Chart 13: Comparison of source, average (mean) annual electricity consumption per household, 2008 to 2015



5.2 Gas

BEIS publish estimates of gas consumption in other sources, which can be used to derive estimates of average domestic gas consumption as published in ECUK Table 3.03 (derived from DUKES Table 1.1.5). Table 9 below contains estimates between 2008 and 2015. These sources include:

Weather correction factors and temperature adjustments can cause variability between the estimates and Table 9 below also contain data for average external temperatures during the heating season (defined as January to March and October to December), for both calendar years and the gas year (October to March).

Table 9: Average domestic gas consumption (kWh) and heating season external temperatures (Celsius), 2008 to 2015

	2008	2009	2010	2011	2012	2013	2014	2015
ECUK 3.03¹ (UK, Calendar year, non-weather corrected basis)	16,546	15,767	17,774	13,252	15,551	15,417	12,404	12,962
ECUK 3.03¹ (UK, Calendar year, weather corrected basis)	16,967	16,214	15,573	14,968	15,488	14,755	14,202	13,983
Sub-national statistics (October [y-1] to September, weather corrected basis)	16,906	15,383	15,156	14,205	14,076	13,680	13,246	13,202
Average Temperature² (January to March, October to December)	6.4	6.3	4.3	7.5	6.6	5.9	7.6	7.6
Average Temperature² (October [y-1] to March)	6.9	5.8	5.6	5.4	7.7	5.2	7.5	7.0

¹ Table 3.03, *Energy Consumption in the UK* (<https://www.gov.uk/government/statistics/energy-consumption-in-the-uk>)

² Table 7.1: *Average temperatures and deviations from the long term mean* (<https://www.gov.uk/government/statistics/energy-trends-section-7-weather>)

The table shows that – in broad terms – the data series are consistent, which provides reassurances to users of the sub-national data provided here.

There are differences in average temperature depending upon whether the calendar or gas year is used. Based on the heating season associated with the gas year, both 2014 and 2015 had the highest average temperature of any year shown in the table. As the sub-national estimates are weather corrected the impact of the temperature on household consumption should be eliminated from the time series. The impact of temperature on average consumption can be seen more clearly when comparing the ECUK non-weather corrected data with the calendar year temperature. The lowest average temperature (4.3) occurs in 2010 the same year as the highest average consumption (17,800 kWh).



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