Methodology and guidance

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### Sub-regional gas and electricity consumption statistics (MSOA/IGZ and LSOA)

<table>
<thead>
<tr>
<th>Sub-regional consumption statistics (2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sectors covered:</strong> Domestic and non-domestic (domestic only at LSOA level).</td>
</tr>
<tr>
<td><strong>Features:</strong> Gas: Annualised, weather corrected. Electricity: Annualised, not weather corrected.</td>
</tr>
<tr>
<td><strong>Source:</strong> Gas: xoserve and independent gas transporters. Electricity: Data aggregators (on behalf of electricity suppliers).</td>
</tr>
</tbody>
</table>

**Statistical releases:**

Access the MSOA/IGZ and LSOA data.

Last release: 2010 data in March 2012.


### 1.1 Introduction

#### 1.1.1 Purpose

Gas and electricity consumption data are available below local authority level, with the aim that this will enable councils and others to monitor and target small areas for further interventions as part of their local energy strategies, and enhance implementation of energy efficiency programmes and thus reduce carbon dioxide emissions.

This chapter provides specific guidance for use of the Middle Layer Super Output Area (MSOA)/Intermediate Geography Zone (IGZ) and Lower Layer Super Output Area (LSOA) level statistics for gas and electricity. DECC advises that the user gains familiarity with the coverage and methodology of the gas (Chapter 2) and/or the electricity (Chapter 3) datasets before reading further.

The table below outlines the sub-regional data that are currently available.
Table 1  Overview of sub-regional consumption statistics currently available

<table>
<thead>
<tr>
<th>Sub-national geography</th>
<th>Area covered</th>
<th>Type of consumption available</th>
<th>Years available and status</th>
</tr>
</thead>
</table>
| Middle Layer Super Output Area (MLSOA)        | England and Wales | • Domestic gas  
• Domestic electricity  
• Non-domestic gas  
• Non-domestic electricity (excluding half hourly consumers, which is only included at Local Authority level) |
| Intermediate Geography Zone (IGZ)             | Scotland     | • Domestic gas  
• Domestic electricity  
• Non-domestic gas  
• Non-domestic electricity (excluding half hourly consumers, which is only included at Local Authority level) |
| Lower Layer Super Output Area (LLSOA)         | England and Wales | • Domestic gas  
• Domestic electricity |
|                                               |              |                                                                                                 | 2007 (pilot study for 45 local authorities only) – 2011         |

1.1.2  Statistical geographies

MSOAs and LSOAs are part of a geographical hierarchy that was first introduced in the 2001 census and is expected to eventually become the standard across National Statistics and beyond. Further information regarding SOAs and their constitution can be found in the glossary or on the ONS website.1

Please note that data is not available at a Parish level. DECC advises that the user instead uses MSOA data, as they may cover a similar area.

Recognising that some local authorities would like data at a more granular level, DECC is currently in talks with energy suppliers and looks to be able to provide data at a lower level soon.

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1 Information regarding Super Output Areas can be found on the ONS website here:
1.2 Main data features (2011 data)

1.2.1 Overview

Data for MSOA/IGZ and LSOA is taken from the same base consumption data used to produce the sub-national consumption datasets at a local authority level.

Consumption is given in kilowatt hours (kWh) along with the number of meters. Average consumption per meter is also provided.

**Important things to note with regards to electricity data:**

1. Consumption is split between ordinary and economy 7 meters. Although economy 7 meters have a cheaper off-peak rate, these meters measure all consumption (households with an economy 7 tariff will have only one meter).
2. For non-domestic MSOA data, industrial half hourly (HH) consumption is provided for each local authority but it is not disaggregated further as doing so would break the UK Statistics Authority’s Code of practice for Official Statistics relating to data disclosure.

1.2.2 MSOA/IGZ and LSOA

MSOA level data is provided for both gas and electricity consumption by domestic and non-domestic consumers, for England and Wales. For Scotland, gas and electricity consumption by domestic and non-domestic consumers are available on an IGZ level (similar to MSOA).

LSOA level data is provided for gas and electricity consumption in England and Wales for domestic consumers only. Due to the small size of these geographical areas, the majority of the non-domestic consumption would be disclosive and would have to be aggregated. Since the non-domestic consumption is available at MSOA, DECC took the decision that publishing non-domestic LSOA level data after aggregation would not add much value for users. In addition, the gas and electricity consumption data at a Data Zone (DZ) level is currently not available for Scotland, as the energy suppliers (who provide us with the data) have not granted DECC permission to publish consumption at this level for disclosure reasons.

1.2.3 Unallocated consumption

Unallocated consumption refers to consumption from electricity and gas meters which could be allocated to the Local Authority but not further down to a specific MSOA. This is mainly as a result of DECC receiving either a partial postcode or no postcode from the data
suppliers. These calculations to determine unallocated consumption have not been repeated for the LSOA workbooks as some LSOAs have not been published and therefore the totals would not match the LA level data.²

1.2.4 Socio-economic data

DECC provides socio-economic census data for each sub-regional geography, which gives further information on population size, geographical size and number of households in these areas. This is to allow users to gain more of an appreciation of the composition of the individual areas. Census information from 2001 can found alongside the gas and electricity consumption data in pre-2008 datasets and census information from 2011 is available as a separate spreadsheet.³

1.3 Data limitations

In a number of cases, there are substantial differences between the number of MPANs and number of households.

Whereas the data for the number of MPANs is consistent with the published electricity and gas consumption data, the household data comes from the 2001 census (with the exception of the Scottish data). As such, changes in the housing stock between these periods causes inconsistencies in the data.

Not all of the LSOA gas and electricity data has been published.

This is a result of the MSOA to which it belongs being disclosive and hence merged with another MSOA, making the LSOA automatically disclosive.

Improvements in data accuracy over time can affect consumption and the number of meters in an area from year to year.

It is important to take care when performing year-on-year comparisons, as changes in consumption and the number of meters in some super output areas can be attributed to updates caused by an improvement in the address database or more accurate profile type information provided by energy suppliers.

² For more information on this, please see section 1.5.
1.4 History of the data collection process

Beginning in late 2005, DECC ran a pilot scheme with just electricity data for 2004 involving 6 LAs - Crawley Borough Council, Bristol City Council, Redcar and Cleveland Borough Council, Guildford Borough Council, High Peak District Council and Kirklees Metropolitan Council. This was aimed at evaluating both the practicality of producing data at MSOA level and investigating the robustness of the consumption estimates at this level. The results suggested such data would be useful and that the robustness of the data for the domestic sector was sufficient to allow a national roll out (though a fuller evaluation of the reliability of the industrial and commercial data was not undertaken as the data is far more complex to analyse).

The MSOA electricity estimates for the domestic sector were validated using a combination of feedback from the local authorities themselves and the direct comparison of consumption patterns across each authority using socio-economic variables taken from the 2001 census. The variables taken from the census included the levels of economic activity, the size and type of the housing stock and average household size, which were used as proxy measures of the level of economic prosperity in the MSOAs.

On 25th March 2010, DECC released 2008 LSOA electricity and gas consumption data for domestic consumers within England and Wales. This was the first time that this data has been published for the whole of England and Wales and follows on from a successful pilot carried out during 2009, when the 2007 data were published for 40 local authorities. Since the methodology for producing these data is still developmental, DECC are currently classing these statistics as experimental.

1.5 Previous datasets

The layout of the spreadsheets differs slightly from year to year, but this does not affect the data comparability. This section provides guidance to interpreting these datasets:

1.5.1 2008 – 2010 data (MSOA/IGZ and LSOA)

The data for 2008, 2009 and 2010 are separated according to whether they refer to MSOA/IGZ or LSOA, gas or electricity, and domestic or non-domestic. In other words, for each English Region and Wales, there are 6 separate Excel workbooks, which relate to:
There are 4 separate Excel workbooks for Scotland, as only IGZ level data is available.

1.5.2 2005 – 2007 data (MSOA/IGZ only)

The datasheets for 2005, 2006 and 2007 show electricity and gas consumption data for England, Wales and Scotland. The first 8 rows contain information on the local authority regarding total consumption, number of meters and average consumption levels for domestic and non-domestic users.

From row 13 downwards, the datasheet contains the full breakdown of consumption for each MSOA, identified by the local authority code followed by an individual MSOA code, e.g. UKJ2041, E02006534 for Adur 001. Data is shown by consumption in kWh (split by ordinary electricity, economy 7 electricity, industrial/commercial electricity, domestic gas and industrial and commercial gas), number of meters and average consumption per meter.

Following this are some combined figures calculated from the prior data and an indicator showing the percentage of domestic gas meters to domestic electricity meters. In cases where consumption and number of meters are suppressed due to disclosure issues, they are not represented in the combined figures and the percentage of domestic gas to domestic electricity meters will appear blank. Finally, additional socio-economic 2001 census data (unless otherwise specified) regarding population, area sizes (hectares) and the number of households in each MSOA are shown in grey.

Below this data there are totals of each column and an indicator of the percentage of each column that is unallocated. This unallocated data is consumption which could be allocated to the LA but not further down to a specific MSOA. This is similar to the data labelled “Unmatched but allocated to LA” in the 2004 data (see below).

1.5.3 2004 data – MSOA electricity only

The 2004 datasheets show electricity consumption data in 2004 for England and Wales. The first 7 rows of each worksheet contain information on the local authority regarding total consumption, number of meters and average consumption levels for domestic and non-domestic users; these are taken from figures published in the December 2005 edition of
Energy Trends. Next to this data is a figure for the percentage of the total domestic consumption within the local authority that DECC were able to allocate to a specific MSOA.

Rows 11 to 17 provide summary information on the MSOA data provided in the section below it. Information is provided regarding total consumption, total meters and average consumption for the following headings:

**Unmatched but allocated to LA.** This relates to consumption that could be allocated to the specified local authority but not any further. This is due to postcode information for some meters being invalid or incomplete, meaning allocation to a specific MSOA was not possible.

**Domestic matched but transferred to commercial.** This relates to consumers, identified as domestic users, but consuming more than 50,000kWh annually who were judged to have a greater probability of being small commercial/industrial consumers. The super output area analysis does not include this reallocation process, which is only shown at local authority level.

**Allocated to LA not to SOA.** This relates to consumption that has been allocated to the specified local authority but where additional geographical information below local authority level indicates that the consumption could actually be taking place outside.

**Total unallocated.** The aggregate value of the consumption relating to the three points above.

**SOA allocated.** This is all electricity consumption that could be accurately allocated to a specific MSOA in the correct local authority.

The section below this shows the full breakdown of consumption data for each MSOA identified by LA code followed by an individual MSOA code, e.g. UKI2301, E02000024 for Barnet 001.

### 1.5.4 Limitations

**In 2004, data is only available for England and Wales.**

It was not possible to produce electricity consumption data for IGZs due to technical difficulties in allocating electricity consumption into the appropriate intermediate geography zones. These difficulties have been overcome for the datasets from 2005 onwards.

**Quality issues meant that in 2004, DECC was only able to match 40% of consumption to a specific MSOA.**

This was due to a lack of complete postcode information for some electricity meters. Data quality has improved in successive years.
Statistical geographies

English region and devolved administration (formerly Government Offices for the Regions)

Government Offices for the Regions (GORs) were established across England in 1994. GORs are built up of complete counties/unitary authorities, and although they are subject to change, they reflect administrative boundaries as at the end of the previous year. After the Comprehensive Spending Review, it was confirmed that the GORs would close on 31 March 2011, shifting focus away from regions to local areas. However, there is still a requirement to maintain a regional level geography for statistical purposes. There are 9 English regions and devolved administrations included in the statistics. Regional totals for Scotland and Wales are included in gas and electricity consumption datasets. Regional totals for Scotland, Wales and Northern Ireland are included in road transport fuels, residual fuels and total final energy consumption datasets.

Local authorities

A local authority is an administrative body in local government. There are 22 local authorities in Wales, 32 local authorities in Scotland and 326 in England included in the analysis. There are 26 district councils in Northern Ireland. This level of disaggregation is similar to the local authority level for Great Britain.

Super Output Areas (SOAs)

SOAs are a geography designed for the collection and publication of small area statistics. They are used on the Neighbourhood Statistics\(^4\) site, and have a wider application across National Statistics.

There are currently two layers of SOA, with areas intermediate in size between 2001 Census Output Areas (OAs) and local authorities and each layer nesting inside the layer above. This offers a choice of scale for the collection and publication of data, and allows for the release of local data that could be disclosive if published for OAs.

SOAs give an improved basis for comparison across the country because the units are similar in size of population than, for example, electoral wards. They are also intended to be stable, enabling the improved comparison and monitoring of policy over time. In addition, figures for user defined geographies will be aggregated and best fitted from data held for OAs and SOAs.

\(^4\) The Neighbourhood Statistics site can be accessed here: http://neighbourhood.statistics.gov.uk/dissemination./
Lower Layer Super Output Areas

Lower Layer SOAs (LSOA/LSOAs) in England and Wales were built using 2001 Census data from groups of Output Areas (typically four to six) and were constrained by the Standard Table wards used for 2001 Census outputs. They had a minimum size of 1,000 residents and 400 households, but had an average of 1,500 residents. Measures of proximity (to give a reasonably compact shape) and social homogeneity (to encourage areas of similar social background) were also included.

(Note: the specific homogeneity criteria used related to type of dwelling – for example, detached/semi-detached, and so on - and nature of tenure – for example, owner-occupied, private rented, and so on).

Following the 2011 Census, there are now 34,753 Lower Layer SOAs (LSOAs) in England and Wales.

Middle Layer Super Output Areas

Middle Layer SOAs (MSOAs/MSOAs) were defined in a two-stage process: an initial set was generated automatically but the boundaries were then modified in consultation with local authorities and other local bodies. The final boundaries were released to the public in August 2004.

As with the LSOAs, initial Middle Layer SOAs were generated automatically by zone-design software. They were built using 2001 Census data from groups of Lower Layer SOAs and had a minimum size of 5,000 residents and 2,000 households. They also fitted within the boundaries of local authorities as at the end of 2002 (corresponding with the geography of the Census).

A nationwide consultation exercise gave local authorities the opportunity to amend the initial Middle Layer SOAs to define areas more suited to local requirements. The consultation resulted in 7,193 MSOAs with an average population size of 7,200.

Following the 2011 Census, there are now 7,201 Middle Layer SOAs (MSOAs) in England and Wales.

For more information on SOAs, LSOAs and MSOAs, please see the ONS website: http://neighbourhood.statistics.gov.uk/dissemination/Info.do?page=aboutneighbourhood/geography/superoutputareas/soa-intro.htm.
Data Zones in Scotland

In Scotland a set of areas similar to Lower Layer SOAs were released in 2004. These areas are referred to as 'data zones'. Their population range is smaller than their Lower Layer SOA counterparts, being between 500 and 1,000. There are 6,505 data zones. In 2005 Scotland also released a further layer, similar to Middle Layer SOAs. This layer is referred to as the 'intermediate geography'. Again, the population range is smaller than their Middle Layer SOA counterparts, being between 2,500 and 6,000. There are 1,235 zones in the Scottish intermediate geography.

For more information on Scottish data zones, please see the Scottish Neighbourhood Statistics website: http://www.sns.gov.uk/.

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For more information on Scottish data zones, please see the Scottish Neighbourhood Statistics website: http://www.sns.gov.uk/.
Step-by-step guide to statistical areas

This step-by-step guide shows you how to:

- Find your MSOA/IGZ or LSOA name using a postcode.
- View output areas on a map.
- Use MSOA/IGZ or LSOA names to find consumption statistics.

Find your MSOA/IGZ or LSOA name using a postcode.

Go to the Office for National Statistics (ONS) Boundary Viewer:
http://www.neighbourhood.statistics.gov.uk/dissemination/LeadBoundaryViewer.do?jessid=ac1f930c30d85232254a851f488197acfffd74826a15d?m=0&s=1269451346965&enc=1&xW=1680&xH=1050&nsjs=true&nsck=true&nssvg=false&nswid=1456

Enter your postcode in the “Area” field under search on the right hand side, and click “Search”.

The search results will present a range of geographical and statistical areas within which your postcode falls.

The MSOA name under which the postcode SW1A 2AW falls is Westminster 018 and the LSOA name is Westminster 018C.

Please note that for Scotland, the IGZ names can be found under the “Intermediate Zone” category. Postcode EH2 2YB would fall under IGZ name Hillside and Calton Hill, for example.
View output areas on a map.

Select any of these in order to see the areas on a map. For example, if choosing to view Westminster 018 will lead to a map of MSOAs on the left hand side, with Westminster 018 in the middle.

It is possible to also view LSOAs on this map by selecting “Lower SO Areas 2003” and clicking “Update Map” on the right hand side.
Use MSOA/IGZ or LSOA names to find consumption statistics.

DECC’s MSOA/IGZ and LSOA data uses the MSOA/IGZ/LSOA code as a reference, rather than the MSOA/IGZ/LSOA name given by the ONS boundary viewer.

Westminster 018 will be used as an example to find domestic MSOA gas data in 2010.


Open the socio-economic data spreadsheet.

Select the ‘MSOA England Wales’ tab and search ‘Westminster 018’.

<table>
<thead>
<tr>
<th>MLSOA Code</th>
<th>MLSOA Name</th>
<th>Population</th>
<th>Area [hectares]</th>
<th>Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>E02000001</td>
<td>City of London 01</td>
<td>7,188</td>
<td>290</td>
<td>4,335</td>
</tr>
<tr>
<td>E02000002</td>
<td>Barking and Dagenham 01</td>
<td>6,237</td>
<td>216</td>
<td>2,739</td>
</tr>
<tr>
<td>E02000003</td>
<td>Barking and Dagenham 02</td>
<td>9,196</td>
<td>214</td>
<td>3,788</td>
</tr>
<tr>
<td>E02000004</td>
<td>Barking and Dagenham 03</td>
<td>6,127</td>
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</tr>
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<td>174</td>
<td>3,319</td>
</tr>
<tr>
<td>E02000008</td>
<td>Barking and Dagenham 07</td>
<td>10,586</td>
<td>142</td>
<td>4,514</td>
</tr>
</tbody>
</table>
We now have the corresponding MSOA Code that will be used to find the energy statistic that we are looking for (domestic gas consumption in 2010). This is ‘E02000977’.

Go to the ‘MSOA electricity and gas: 2010’ page on DECC’s website:

Open the ‘Middle Layer Super Output Area (MSOA) domestic gas estimates 2010: All data’ file.

Search ‘E02000977’.
We now have the data we were looking for. In the MSOA Westminster 018 (or E02000977) in 2010, domestic gas consumption was 54,970,634 kWh, there were 4,132 meters and average consumption was 13,304 kWh.