



Department
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Sub-national electricity and gas consumption statistics

MSOA/IGZ and LSOA level statistics (2012 data)

March 2014

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Sub-national consumption statistics

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1. Background

This factsheet accompanies the gas and electricity sub-national energy consumption analysis below local authority level produced by the Department of Energy and Climate Change (DECC). These data are used by a range of users for different purposes, including to enable local authorities to understand local energy use and through this monitor and target small areas for interventions as part of their local energy strategies. They are also used to enhance implementation of energy efficiency programmes.

The information contained in this factsheet acts only as a background to the datasets and due to the large number of areas and variables covered by these datasets, this factsheet does not contain any direct comparisons between areas. It is strongly advised that prior to using the datasets, users familiarise themselves with Chapter 4 of the Methodology and guidance booklet: <https://www.gov.uk/government/publications/regional-energy-data-guidance-note>.

We value feedback on the data, including contents, presentation and how it has been used. Any feedback or comments can be sent to EnergyEfficiency.Stats@decc.gsi.gov.uk.

1.1 Consumption information below local authority area level

In December 2013, DECC published 2012 electricity and gas consumption data for local authorities in Great Britain. In March 2014, DECC released these 2012 electricity and gas consumption data at the following levels below local authority:

1. Middle layer super output area¹ (MSOA) level (England and Wales);
2. Intermediate geography zone (IGZ) level (Scotland); and
3. Lower layer super output area (LSOA) (England and Wales).

These datasets will be referred to as the SOA datasets throughout this factsheet.

English regions, local authorities and electoral wards vary according to size and population. However, the lower level geographies (MSOAs, IGZs and LSOA level) have stable boundaries, are of consistent size across the country and are not subject to regular boundary changes (except during Census recalibration once every ten years). These datasets will be of benefit to users who wish to make more focussed geographical comparisons than those made at a regional² or local authority level.

Data for 2012 have been published based on 2011 Census boundaries and data for 2011 have been revised³ to also reflect the 2011 boundaries.

¹ Further information about super output areas are available on the Office of National Statistics website at: <http://www.ons.gov.uk/ons/guide-method/geography/beginner-s-guide/census/super-output-areas--soas-/index.html>.

² 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.

³ Further details about the revisions made are included in page 5 of this document.

1.2 Revisions to sub-national published datasets

2011 super output area data

All gas and electricity consumption datasets for 2011 data have been republished reflecting the 2011 Census boundaries (these were previously published for 2001 Census codes). Overall consumption totals and the total number of meters remain the same, but there are some small differences in regional and local authority allocations.

At the same time as making this update, a few corrections were made to the allocation of geographical codes based on postcode information – having the greatest impact on areas in Scotland. This is due to the address matching exercise⁴ involving the ONS Postcode Lookup⁵ (ONSPL) file. At the time of publishing the 2011 sub-national electricity and gas consumption data, address information for Scotland were incomplete⁶ within the ONSPL and geographical data for earlier years had been used. This meant that new operating meters could not be matched and were included in the ‘Unallocated’⁷ row within the consumption datasets. These matches have now been reallocated for the 2011 data resulting in differences for Scotland. The revised estimates also update data for a small number of LSOAs which appeared in two different local authorities (18 of the 34,378 LSOAs within the electricity dataset and 95 LSOAs within the gas dataset). This occurred because geographical codes were allocated using exact postcode matching which led to a small number of LSOAs being assigned to multiple LAs. The revised postcode matching method uses the National Statistics Postcode Lookup and means all properties within any LSOA are assigned to the same LA.

2012 electricity non-domestic local authority data

Revisions have also been made to the electricity non-domestic consumption figures for 2012. These data were published as provisional in December 2013⁸. After further investigations, it was discovered that a number of meter readings were missing from the data extracts. These have since been provided and the non-domestic electricity figures have been revised to reflect these additional meters.

1.3 Future plans and recommendations

During 2013–14 DECC migrated the production of sub-national estimates to a new IT system within DECC. As part of this process a parallel run on both the old and new systems has

⁴ For further information about the address matching exercise, please refer to page 24 of the sub-national methodology and guidance booklet, which can be accessed here:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/267603/Sub-national_methodology_and_guidance_booklet.pdf.

⁵ Further information about the ONSPL can be found at: <http://www.ons.gov.uk/ons/guide-method/geography/products/postcode-directories/-nspp-/index.html>.

⁶ Further information can be found here: <http://www.ons.gov.uk/ons/guide-method/geography/news/bulletin-2013-09--ons-postcode-directory-and-national-statistics-postcode-lookup--august-2013/index.html>

⁷ ‘Unallocated’ consumption is consumption that was not able to be matched to an area due to incomplete or a lack of postcode information (this usually accounts for less than 1 per cent of consumption).

⁸ For further information regarding the local authority data, please refer to the LA level factsheet available here:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/267585/Sub-national_electricity_consumption_factsheet_2012.pdf or dataset available here: <https://www.gov.uk/government/statistical-data-sets/regional-and-local-authority-electricity-consumption-statistics-2005-to-2011>.

been undertaken. This has provided a good opportunity to review the processes and assumptions made in the production of sub-national estimates. DECC is also aware of some changes to suppliers administrative data systems which have been implemented over the last few years which may lead to improved estimates. As a result DECC intends to review the methodology and all the assumptions used in the production of these estimates with the intention of implementing these changes for the 2013 estimates due to be published in December 2014.

To date, LA estimates have been published in December and SOA estimates the following March. We are planning to bring forward the publication of the SOA level statistics by three months to December, to be published alongside the LA level statistics. We do note however that this will be a challenge to analyse and publish the electricity and gas meter point datasets to this level within three months of being supplied the data in October.

To inform this review and to allow us to prioritise developments, users views on the presentation, content and methodology of the sub-national consumption data are welcomed. Below are some planned changes based on user feedback received to date along with further suggested improvements. We also encourage any additional views/feedback users may have.

Presentation

- **Other ways of displaying the data**

Alongside the published datasets, factsheets are available for users to better understand the key points of each dataset. A methodology and guidance booklet is also available⁹ summarising the methodology used for each sub-national consumption dataset and a few tools (outlined in Annex C of this document) and interactive maps¹⁰ are also available to aid interpretation of the datasets.

We would be interested to hear about any preferences for the data to be displayed in any other way, and also about the usefulness of currently published documents. For example:

- i. Are the factsheets helpful and do they contain the right level of detail?
- ii. Are there any additional maps which can be published to help display the data?
- iii. Are the tools useful, and are there any changes, or additional tools, that would be helpful?

- **Format of data tables**

The sub-national gas and electricity consumption statistics are currently displayed by adding the most recent publication of data as a new tab. We are interested in users views of the current format, if it is helpful or if it would be of benefit if this were to be formatted differently. A few ideas for alternative ways of publishing this data include:

⁹ The sub-national methodology and guidance booklet can be accessed here:
<https://www.gov.uk/government/publications/regional-energy-data-guidance-note>.

¹⁰ The sub-national interactive maps can be accessed here:
http://tools.decc.gov.uk/en/content/cms/statistics/local_auth/interactive/domestic_ge/index.html.

- i. Would it be more useful to have the data split by domestic and non-domestic sector, rather than by year? The data are currently displayed by adding annual updates via the insertion of a new tab into the workbook. Would it be helpful for our users if we displayed the data by sector on each tab (ie, annual updates taking form as an additional column), rather than the current method by year?
- ii. Would it be of benefit to have all years data in one tab.
- iii. The level of formatting used for the published versions of the datasets – is it too much, or should there be more?
- iv. Usefulness of publishing csv files alongside the Excel tables.

- **Rounding**

Consumption data is currently published to the nearest kilowatt hour (kWh). This suggests the data are more accurate than we can realistically be confident. Therefore, we intend to round these numbers in future. We are interested in whether users of the data would prefer consumption values to be published to the nearest ten, or hundred kWh, or any other unit – or perhaps by consumption range.

Content

- **Publication of quartile values**

Currently, the number of meters and overall consumption are published at local authority, MSOA and LSOA level, alongside mean consumption values. The mean is a useful indicator of changes in consumption behaviour over time, however it does not represent the typical consumption or take into account the spread of the data. We have had feedback that it would be helpful to include the upper and lower quartile values and the median in the published statistics.

We are therefore asking more widely if users would find it of benefit if future publications contained the quartile and median values.

- **Publication of consumption data at different geographical levels.**

Sub-national consumption data are currently published at a local authority, MSOA and LSOA level. If of benefit to our users, we can investigate publishing these data for geographical breakdowns, such as:

- i. **postcode level** - if this is of interest, please let us know if postcode sector or postcode unit would be more useful (please note, postcode unit may have a greater number of disclosive rows and therefore will be subject to mergings) and how these data could/would be used in ways that LSOA data can not.

- ii. **Parliamentary constituency data** – as with the postcode data, if you think this would be useful please let us know and also let us know how the data would be used.

We would also welcome feedback about other geographic breakdowns users may find helpful and will assess the possibility of publishing these in future.

Methodology

- **Updates to previously published data for consistency between years**

Currently, consumption values are based on meter readings received annually and are not revised (even though on occasions more accurate data is made available at a later date). In cases where there is evidence that a meter is consuming consistent levels of gas/electricity with earlier years, it is proposed to revise earlier datasets to include DECC “estimated” readings. An example is in the case of a meter with a valid consumption reading in 2010 and 2012. This meter however is missing from the 2011 dataset, despite there being evidence to suggest that this meter was still operational in 2011.

It is proposed that an estimated reading (an average of the 2010 and 2012 reading, or an interpolation between the 2010 and 2012 data based on average changes for the LSOA/MSOA) should be included and the 2011 dataset be revised. This would imply that data is subject to revisions the year following initial publication.

- **Gas profile**

Historically gas data has not been supplied with a sector/profile indicator and instead a domestic/non-domestic split has been applied based on the gas industry threshold of 73,200 kWh, such that any meter consuming less than this amount is deemed to be a domestic meter and any meter with a consumption of 73,200 kWh or more is deemed to be non-domestic. Changes have been made to the gas industry systems and so that information on whether a property is domestic or non-domestic is now provided. However, the quality of this indicator is unknown.

It is proposed that this variable should be assessed for its use with the sub-national data, and if deemed suitable, this variable will be used to assign meters to the appropriate sector. Historic data to 2005 could also be revised.

- **Update data prior to 2011 according to the 2011 census codes**

Consumption data between 2005 and 2009 are published based on 2001 census geography codes, and data between 2010 and 2012 are published according to the 2011 census codes. We have noted from user feedback, that consumption data is often used for time series analysis and that this is a little tricky with the changes in codes for some areas. The proposal is to apply consistent 2011 Census codes for data from 2005 onwards.

Data between 2005 and 2009 based on the 2001 Census codes will still be available via the DECC statistics pages of the Government website.

- **Improvements to address matching and further exploration of incomplete address information**

In earlier address matches (prior to the 2012 dataset), cases where insufficient address information (such as a partial postcode) had been supplied for a meter, the meter and its assigned consumption were included in the ‘Unallocated’ row in the published statistics. Improvements were made to the address matching techniques used for the 2012 dataset and partial address information was used to determine if a possible match to an LA, MSOA and/or LSOA could be made.

It is proposed that where previously it had not been possible to allocate a meter to a local authority, MSOA or LSOA, but has now been matched in the most recent year (for example, in cases where better address information has later become available), this match should be carried back to the earlier years data and the meter allocated to

its area based on latest address information. This will affect the regional and unallocated number of meters and consumption at area level, but will have no effect upon overall totals.

Please provide any feedback regarding the above, or any additional comments/suggestions you may have by **the end of June 2014** in order to allow DECC to take these into account for the 2013 estimates. These can be sent by email to: EnergyEfficiency.Stats@decc.gsi.gov.uk.

Or by post to:

Sub-national Consumption Statistics Team
Department of Energy and Climate Change
King's Building
c/o 3 Whitehall Place
London, SW1A 2AW

We periodically update our users of publication releases and any changes made to datasets. If you are interested in being added to the sub-national statistics mailing list, please send a request to: EnergyEfficiency.Stats@decc.gsi.gov.uk.

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

2.1 Background

MSOAs are a statistical geography developed by the Office for National Statistics (ONS) which are used in England and Wales. The 7,201¹¹ MSOAs in England and Wales have a minimum population of 5,000 people (or 2,000 households). Scotland uses a similar geographical breakdown as MSOAs, and these Scottish areas are called IGZs¹². Compared to an MSOA, an IGZ is slightly smaller containing an average of around 4,000 people (with a minimum of 2,500 people).

The published 2011 and 2012 MSOA tables used in the analysis are based on 2011 Census geographies. Earlier data are based on the 2001 Census boundaries¹³. Changes have been made to some of the 7,194 MSOA geographies between the 2001 and 2011 Census. There have been an increase of 10 MSOAs in England and a reduction of 3 MSOAs in Wales. There were 154 modifications made to the MSOA geographies: 7,040 MSOAs remained unchanged, 60 were merged with one or more other 2001 MSOA, 32 have been split into two or more 2011 MSOAs and 62 have had a 'complex'¹⁴ correction.

Further information about the boundary changes and the impact of the changes are available at the ONS website: <http://www.ons.gov.uk/ons/guide-method/geography/beginner-s-guide/census/output-area--oas-/index.html>.

2.2 MSOA/IGZ published datasets

In March 2014, DECC published electricity and gas consumption estimates for 2012 MSOA/IGZs covering domestic and non-domestic users across Great Britain, these can be accessed at: <https://www.gov.uk/government/collections/mlsoa-and-lsoa-electricity-and-gas-estimates>.

The datasets include annual consumption (in kWh) figures, the number of meters and the average consumption per meter (in kWh) for each MSOA/IGZ in Great Britain¹⁵. Local

¹¹ There were 7,194 MSOAs at the time of the 2001 Census geographies. .

¹² The intermediate zones are aggregations of data zones within local authorities and contain between 2,500 and 6,000 people. Further information about Scotland's statistical geography can be accessed at: <http://www.scotland.gov.uk/Publications/2005/02/20697/52626>.

¹³ 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](#) (LSOA) and [Middle layer super output areas \(2001\) to middle layer super output areas \(2011\) to local authority districts \(2011\) E+W lookup.zip](#) (MSOA).

¹⁴ These are MSOAs which have been redesigned because of boundary changes made to the local authority and/or to improve their social homogeneity.

¹⁵ 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 2.4 of this factsheet.

authority codes and names have also been provided. These datasets follow on from the publication of similar estimates for 2005 to 2011 and are classed as National Statistics.

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 users¹⁶.
2. **Domestic electricity estimates** - A further split by domestic ordinary and economy 7 (off peak) meters has also been provided.
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 due to data disclosure issues, as these consumers are generally very large energy users and there would therefore be a risk of disclosure if these data were provided at MSOA level so half hourly meters data has not been disaggregated below local authority level. The spreadsheet does contain half-hourly consumption values at a local authority level.

These four excel workbooks can be accessed from the following link:

<https://www.gov.uk/government/collections/mlsoa-and-lsoa-electricity-and-gas-estimates>.

¹⁶ It is estimated that there are around 2 million small businesses incorrectly classed as domestic using this cut-off threshold.

3. Lower layer super output area (LSOA)

3.1 Background

Gas and electricity consumption data are also available at LSOA level for England and Wales. An LSOA is also a statistical geography developed for the Census by the ONS. The 34,753¹⁷ LSOAs in England and Wales have a minimum population of 1,000 (or around 400 households) and MSOAs are formed from groupings of LSOAs¹⁸.

The published LSOA data for 2011 and 2012 are based on 2011 Census geographies. Data prior to 2011 are based on the 2001 Census geographies. Similar to the MSOA geographies, the LSOA boundaries have also changed between the 2001 and 2011 Census. There has been an increase of 362 LSOAs in England and an increase of 13 LSOAs in Wales. There were 859 modifications made to the 34,378 LSOA geographies: 33,519 LSOAs remained unchanged, 314 were merged with one or more other 2001 LSOA, 383 have been split into two or more 2011 LSOAs and 162 have had a 'complex'¹⁹ correction.

3.2 LSOA data limitations

Due to disclosure, DECC 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, DECC took the decision that publishing non-domestic 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.

3.3 LSOA level published consumption datasets

DECC released 2012 LSOA electricity and gas consumption data in March 2014 for domestic consumers within England and Wales. This data has previously been published for England and Wales for the years 2008 to 2011. 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

¹⁷ The number of LSOAs in England and Wales has increased from 34,378 MSOAs in the 2001 Census to 34,753 MSOAs in the 2011 Census.

¹⁸ For an illustration of LSOAs within an MSOA please see Annex A.

¹⁹ These are LSOAs which have been redesigned because of boundary changes made to the local authority and/or to improve their social homogeneity.

electricity) in each LSOA in England and Wales. Since the methodology for producing these data is still developmental, DECC are currently classing these statistics as experimental.

The two available datasets at an LSOA level are:

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

These two excel workbooks can be accessed from the following link:

<https://www.gov.uk/government/collections/mlsoa-and-lsoa-electricity-and-gas-estimates>.

3.4 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/publications/lsoa-estimates-of-households-not-connected-to-the-gas-network>. Further details about the off gas data have been discussed further in Article 5 of the December 2013 edition of Energy Trends which can be accessed here: <https://www.gov.uk/government/collections/energy-trends>.

Annex A An illustration of LSOA regions within an MSOA

The map below shows an example of LSOA areas within an MSOA in the local authority of Crawley. The black outline represents the MSOA and the individual codes represent LSOA areas within this MSOA.



For further information about locating SOA codes of interest, please refer to Annex A of the Methodology and guidance booklet available online:

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

Annex B Sub-national consumption publications

Electricity consumption statistics

- Electricity consumption statistics at local authority level (Great Britain):
<https://www.gov.uk/government/statistical-data-sets/regional-and-local-authority-electricity-consumption-statistics-2005-to-2011>.
- Electricity consumption statistics at MSOA/LSOA level (England and Wales):
<https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/mlsoa-and-lsoa-electricity-and-gas-estimates>.
- Experimental statistics are also available for Northern Ireland:
<https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/sub-national-electricity-consumption-in-northern-ireland>.

Gas consumption statistics

- Gas consumption statistics at local authority level (Great Britain):
<https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/sub-national-gas-consumption-data>.
- Gas consumption statistics at MSOA/LSOA level (England and Wales):
<https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/mlsoa-and-lsoa-electricity-and-gas-estimates>.

Road transport consumption statistics

- Road transport consumption statistics at local authority level (United Kingdom):
<https://www.gov.uk/government/statistical-data-sets/road-transport-energy-consumption-at-regional-and-local-authority-level>.

Residual fuel (non-electricity, non-gas, non-road transport fuels) consumption statistics

- Residual fuel consumption statistics at local authority level (United Kingdom):
<https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/sub-national-consumption-of-other-fuels>.

Total final energy consumption statistics

- Total final energy consumption statistics at local authority level (Great Britain):
<https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/total-final-energy-consumption-at-sub-national-level>.

Before using any of the above datasets, it is highly advised to refer to the related chapter in the Sub-national methodology and guidance booklet:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/267603/Sub-national_methodology_and_guidance_booklet.pdf.

Annex C Tools available to analyse sub-national consumption statistics

DECC has published three tools to aid the user to further explore the data:

1. Sub-national electricity and gas consumption statistics analytical tool

This tool has been created for analysing electricity and gas consumption at the local authority level, and has been produced to help local authorities and other regional bodies use DECC's sub-national gas and electricity data to better understand changes in consumption over time. The tool allows for three distinct types of analysis:

- Analysis of individual local authority data in comparison to its respective regional average and the Great Britain average;
- Comparison between a selected local authority and five additional local authorities;
- Change between all local authorities in Great Britain.

The tool can be accessed here: <https://www.gov.uk/government/collections/analytical-tools>.

2. Look-up spreadsheets

The look-up spreadsheets are published alongside the SOA datasets, and are aimed at users interested in which SOA codes are included in a local authority, or for users who would like to determine which NUTS4 corresponds to which local authority. The spreadsheet also collates annual consumption (kWh), the number of meters and average consumption (kWh) for each SOA, or LA of interest.

The MSOA and LSOA look-up spreadsheets are available here:

<https://www.gov.uk/government/collections/mlsoa-and-lsoa-electricity-and-gas-estimates>.

3. Change over Time Analysis (CoTA) Viewer

CoTA is a visual tool which assists the analysis of change over time for English regions, local authorities and MSOA areas. The purpose of the viewer is to help local authorities and other regional bodies create an evidence base when developing and monitoring policies for small geographic areas. Information on changes in total consumption, number of meters, and average consumption between two years can be analysed at either local authority or MSOA level for domestic (ordinary and economy 7) and non-domestic electricity consumption, and domestic and non-domestic gas consumption. The tool helps users to explore questions like:

- Has the areas energy consumption changed compared to others in the region?
- Has much change occurred within a local authority?
- Which MSOAs have experienced significant change?

A user guide and tool can be accessed from the following page:

<https://www.gov.uk/government/publications/change-over-time-analysis-cota-tool>.

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