



# Local Authority carbon dioxide emissions estimates 2013

Statistical release

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This document is also available from our website at: <a href="https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-2013">https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-2013</a>

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# **Executive summary**

This National Statistics publication provides the latest estimates of carbon dioxide emissions for Local Authority (LA) areas for 2005-2013. This report explains the background to the estimates, summarises the key results, and discusses some of the issues which need to be considered when using the data. Full details of the results and methodology are available in the Technical Report and accompanying spreadsheets, which can be found at the links below:

https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-2013

## Main Findings:

- Emissions on an end-user basis (i.e. where emissions are distributed according to the point of energy consumption or point of emission if not energy related) have been assigned to all 406 Local Authorities in the UK: 326 of these are in England, 32 in Scotland, 26 in Northern Ireland and 22 in Wales.
- Since 2012, emissions have decreased in 358 out of the 406 Local Authorities (88 percent). This is consistent with the decrease in overall UK emissions from 2012 to 2013.
   The main drivers of the decrease in UK emissions in 2013 were a decrease in the use of coal and gas for electricity generation.
- Overall in 2013, 43 percent of end-user emissions assigned to Local Authority areas (excluding emissions from Land Use, Land Use Change and Forestry (LULUCF)) were attributed to the industry and commercial sector, 30 percent to the domestic sector, and 27 percent to transport. There are wide local variations on this mainly because of the economy and geography of different local areas.
- The industry and commercial sector had the highest share of end-user emissions in 44 percent of authorities. The domestic sector had the highest share in 30 percent and the transport sector had the highest share in 26 percent of authorities.
- In 2013, about 50 percent of domestic end-user emissions came from gas use and 41 percent were due to electricity consumption.
- In 2013, domestic end-user emissions were less than 2 tonnes per person in 28 percent of LAs, between 2 and 2.5 tonnes per person in 65 percent, between 2.5 and 3 tonnes per person in 7 percent and above 3 tonnes per person in 1 percent.

## Introduction

The UK compiles an annual inventory of its greenhouse gas (GHG) emissions in order to monitor progress against domestic and international targets such as the Kyoto Protocol. Disaggregated versions of the UK inventory are also produced for England, Scotland, Wales and Northern Ireland, along with maps estimating the geographical distribution of the sources of emissions.

Carbon dioxide (CO<sub>2</sub>) is the main greenhouse gas, accounting for about 82 percent of the UK greenhouse gas emissions in 2013. In recent years, increasing emphasis has been placed on the role of regional bodies and local government in contributing to energy efficiency improvements, and hence reductions in carbon dioxide emissions. To assist this, this publication combines data from the UK's GHG inventory with data from a number of other sources, including local energy consumption statistics, to produce a nationally consistent set of carbon dioxide emissions estimates at Local Authority level.

The statistics show emissions allocated on an "end-user" basis where emissions are distributed according to the point of energy consumption (or point of emission if not energy related). Except for the energy industry, emissions from the production of goods are assigned to where the production takes place. Therefore, emissions from the production of goods which are exported will be included, and emissions from the production of goods which are imported are excluded.

The statistics are largely consistent with the UK national GHG inventory and with the Devolved Administration GHG inventories, but there are some minor methodological differences which are explained later in this publication. If you are looking for emissions figures at UK or DA level, you should use the UK or DA inventories rather than this publication (see Annex).

These statistics cover the period from 2005 to 2013. A consistent time series has been produced by re-calculating the 2005 to 2012 estimates to reflect the methodological changes used in calculating the 2013 estimates. This is important as it allows changes to be monitored over time.

Full details of the results and methodology are available in the supplementary reports and files published alongside this statistical release.

## Use of the estimates

The purpose of these estimates is to assist those wishing to understand and assess changes in Local Authority emissions. Local Authorities are not mandated to have greenhouse gas emissions reductions targets, but some Local Authorities do have such targets. These statistics allow Local Authorities to track their GHG emissions trends over time, and measure progress against any targets they have. While Local Authorities are the main users of the statistics, other users include non-profit organizations, the Devolved Administrations, government departments, and academia.

It is important to bear in mind that circumstances vary greatly between authorities, and that Local Authorities have relatively little influence over some types of emissions. For all these reasons, these statistics should be interpreted with caution. However, used with care they can provide help in setting priorities. In particular, the dataset is sufficiently robust to set a baseline against which action on climate change can be monitored at a local level.

It should be noted that the results for areas formally known as Government Office Regions, which are also available from the dataset, are much more robust. Most of the difficulties in allocating data to Local Authorities have little impact at regional level. Problems of interpretation, such as economic activity or transport taking place across boundaries, still exist but are less acute at the regional level than at the local level.

There are some important limitations that users of these estimates should be aware of. These include:

- Unallocated electricity where electricity sales within the sub-national dataset cannot be successfully allocated to specific LAs, due to lack of information.
- Transport emission estimates rely on national traffic statistics, and distribution of traffic on minor roads has had to be imputed at local level from regional level data
- The local distribution of emissions from sources other than gas, electricity generation or transport largely has to be estimated from proxy information such as population or employment data
- Some of the key sources used for mapping emissions do not cover the whole of the UK, and therefore alternative methods have had to be used for authorities in Northern Ireland.

Further details on data quality and the methods used are available in the <u>Methodology</u> <u>Summary</u> and the <u>Technical Report</u>.

## 2013 emissions

Estimates of carbon dioxide emissions have been produced for each Local Authority in the UK from the following broad source categories:

- Industry, commercial & public sector (including electricity-related emissions)
- Domestic (including electricity-related emissions)
- Transport
- Land use, land use change and forestry (including removals of carbon dioxide from the atmosphere, so that net emissions from this sector can sometimes be negative)

The level of sectoral detail is constrained by that available in the DECC statistics on local electricity and gas use. To estimate a further breakdown would have involved further general assumptions about energy use for different sectors, since local data is not available. However, further details, mostly in terms of fuel types, are shown in the <a href="Technical Report">Technical Report</a> in order to provide additional insight into how the estimates are constructed.

## 2013 emissions by region

Table 1 shows a summary of the end-user emissions by region. Estimates are also given on a per capita basis<sup>1</sup> in order to make some allowance for the different size of regions. However, it should be noted that while emissions per capita may be a useful measure for domestic emissions, emissions from industry and transport are driven by many factors other than resident population. Therefore industrial and commercial, and transport emissions per capita should be interpreted with caution.

Results for individual Local Authorities can be found in the <u>Full Dataset spreadsheet</u> published alongside this statistics release. There is a great deal of variation between LAs. In particular a significant amount of industrial emissions are concentrated in a few areas, so the contribution of industrial and commercial emissions in 2013 for specific Local Authorities may be different from the regional averages in Table 1.

<sup>&</sup>lt;sup>1</sup> Based on the Office of National Statistics (ONS) mid-year population estimates for 2013 http://www.ons.gov.uk/ons/rel/pop-estimate/population-estimates-for-uk--england-and-wales--scotland-and-northern-ireland/index.html

Table 1: End-user carbon dioxide emissions

Regional Summary, 2013

MtCO<sub>2</sub>/tCO<sub>2</sub> per person

| Region / country        |                         | (millior | Total em<br>tonnes c |        | xide) |                         |          | a emissior<br>dioxide pe |        |       |
|-------------------------|-------------------------|----------|----------------------|--------|-------|-------------------------|----------|--------------------------|--------|-------|
|                         | Industrial & commercial | Domestic | Transport            | LULUCF | Total | Industrial & commercial | Domestic | Transport                | LULUCF | Total |
| North East              | 17.1                    | 5.5      | 4.3                  | -2.6   | 24.3  | 6.5                     | 2.1      | 1.6                      | -1.0   | 9.3   |
| North West              | 20.5                    | 14.9     | 13.2                 | 0.0    | 48.7  | 2.9                     | 2.1      | 1.9                      | 0.0    | 6.9   |
| Yorkshire and           | 21.5                    | 11.3     | 10.4                 | 0.2    | 43.5  | 4.0                     | 2.1      | 2.0                      | 0.0    | 8.1   |
| the Humber              |                         |          |                      |        |       |                         |          |                          |        |       |
| East Midlands           | 15.1                    | 9.8      | 10.4                 | 0.2    | 35.5  | 3.3                     | 2.1      | 2.3                      | 0.1    | 7.7   |
| West Midlands           | 14.3                    | 11.4     | 12.0                 | 0.3    | 38.0  | 2.5                     | 2.0      | 2.1                      | 0.0    | 6.7   |
| East of England         | 13.9                    | 12.3     | 13.2                 | 0.6    | 40.0  | 2.3                     | 2.1      | 2.2                      | 0.1    | 6.7   |
| Greater London          | 18.3                    | 15.2     | 7.6                  | 0.0    | 41.2  | 2.2                     | 1.8      | 0.9                      | 0.0    | 4.9   |
| South East              | 18.6                    | 18.4     | 18.9                 | -0.1   | 55.8  | 2.1                     | 2.1      | 2.2                      | 0.0    | 6.3   |
| South West              | 11.9                    | 10.8     | 11.2                 | 0.5    | 34.5  | 2.2                     | 2.0      | 2.1                      | 0.1    | 6.4   |
| England <sup>1</sup>    | 151.2                   | 109.6    | 101.4                | -0.9   | 361.4 | 2.8                     | 2.0      | 1.9                      | 0.0    | 6.7   |
| Wales <sup>1</sup>      | 17.4                    | 6.7      | 6.0                  | -0.5   | 29.6  | 5.7                     | 2.2      | 1.9                      | -0.2   | 9.6   |
| Scotland <sup>1</sup>   | 17.7                    | 12.3     | 10.3                 | -4.9   | 35.3  | 3.3                     | 2.3      | 1.9                      | -0.9   | 6.6   |
| N. Ireland <sup>1</sup> | 5.9                     | 4.2      | 4.0                  | 1.5    | 15.6  | 3.2                     | 2.3      | 2.2                      | 8.0    | 8.6   |
| UK <sup>2</sup>         | 196.9                   | 133.3    | 121.8                | -6.0   | 445.9 | 3.1                     | 2.1      | 1.9                      | -0.1   | 7.0   |

Source: Full dataset and Per Capita sheets from 2005 to 2013 UK local and regional CO2 emissions: full dataset Excel spreadsheet

#### Note:

- These data are not fully consistent with the equivalent data for the Devolved Administrations. A reconciliation of these sets of figures
  can be found in the England Reconciliation, Wales Reconciliation, Scotland Reconciliation and Northern Ireland Reconciliation sheets
  from 2005 to 2013 UK local and regional CO2 emissions: full dataset Excel spreadsheet.
- 2. Sum of Local Authority emission estimates are not fully consistent with the official inventory for the UK (see Table 14 for details).

Emissions per capita allow comparison between areas of different population size. Wales, Northern Ireland, the North East, and Yorkshire and the Humber have the highest emissions per capita. This is mainly due to higher emissions per capita from the industrial and commercial sector reflecting the industrial base present in these regions, except for Northern Ireland where industrial and commercial per capita emissions are close to the UK average, but per capita emissions from the LULUCF sector are particularly high. Greater London has the lowest per capita emissions, as the urban nature of the transport system and the high population density of Greater London results in lower emissions than the UK average when total emissions, including non-domestic emissions, are spread across residents. Additionally in Greater London there are a greater proportion of residential areas which means that large industrial facilities are unlikely to be located there, which contributes to the low per capita emissions.

Figure 1: 2013 end-user carbon dioxide emissions by region and sector

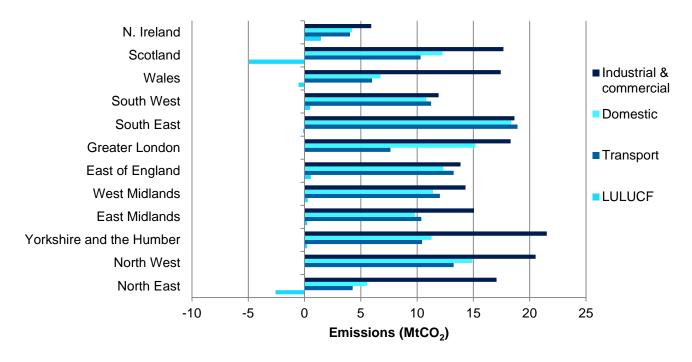
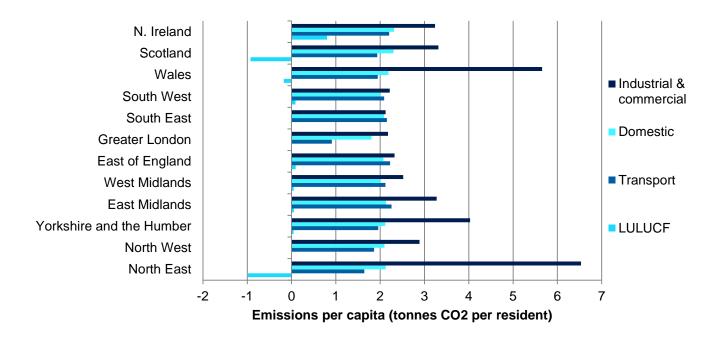


Figure 2: 2013 per capita end-user carbon dioxide emissions by region and sector



## 2013 emissions by sector

Table 2 and Figure 3 below show the number of Local Authorities with different proportions of emissions coming from the different sectors. The proportion of emissions attributable to the industrial and commercial, domestic and transport sectors differs considerably across the Local Authorities. For the majority there is no single sector that accounts for more than 50 percent of emissions.

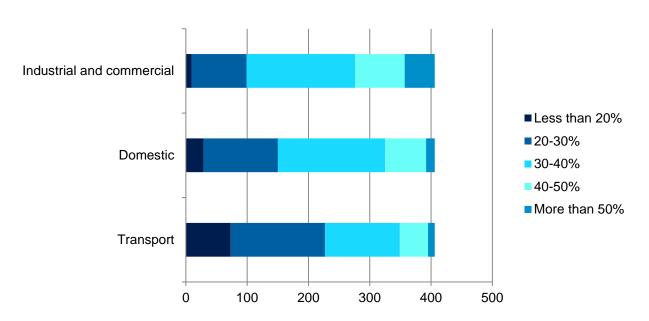
Table 2: Sectoral breakdown of emissions: Number of Local Authorities with a given proportion of emissions (excluding LULUCF)

Local Authorities, 2013

|                         | Number of Local Authorities, excluding LULUC        |           |     |  |  |  |  |
|-------------------------|---|-----------|-----|--|--|--|--|
| Proportion of emissions | Sector (number of Local Authorities where sector    |           |     |  |  |  |  |
| _                       | accounts for corresponding proportion of emissions) |           |     |  |  |  |  |
|                         | Industrial and                                      | Transport |     |  |  |  |  |
| _                       | commercial  |           |     |  |  |  |  |
| Less than 20%           | 9   | 29        | 73  |  |  |  |  |
| 20-30%                  | 90  | 121       | 154 |  |  |  |  |
| 30-40%                  | 177   | 175       | 122 |  |  |  |  |
| 40-50%                  | 81  | 67        | 46  |  |  |  |  |
| More than 50%           | 49  | 14        | 11  |  |  |  |  |
| Total                   | 406   | 406       | 406 |  |  |  |  |

Source: Full dataset sheet from 2005 to 2013 UK local and regional CO2 emissions: full dataset Excel spreadsheet

Figure 3: Sectoral breakdown of emissions: Number of Local Authorities with a given proportion of emissions in 2013 (excluding LULUCF)



#### **Domestic sector**

In 2013, domestic sector emissions for all apart from 9 Local Authorities were lower than in 2012. The main driver for this was a decrease in the use of coal and gas for electricity generation, which led to a decrease in emissions for domestic electricity. In 2013, about 50 percent of domestic end-user emissions arose from gas use, 41 percent from electricity, and 9 percent from consumption of other fuels.

Looking at longer term trends, national emissions from the domestic sector have decreased since 2005 and the same is true for almost all Local Authorities. The Local Authorities with the largest decrease in domestic sector end-user emissions since 2005 are Knowsley and Blackpool where there has been a reduction of more than 20 percent.

Emissions per capita vary least between areas for the domestic sector, and are dominated by gas and electricity consumption, for which real local data are available. DECC publishes domestic energy consumption data to regional and Local Authority level<sup>2</sup>. These data have been used to estimate emissions for the domestic sector for all Local Authorities, related to gas and electricity consumption. Domestic emissions here represent emissions from energy consumption in and around the home, including emissions attributable to the use of electricity, but not activities by private individuals elsewhere, such as personal travel. Table 3 shows a range of emissions per capita in this sector and it is noticeable that from 2012 to 2013 that Local Authorities have moved into lower emissions per capita categories. This is due in part to emissions re-allocated to this sector from electricity generation from the national totals which has decreased since 2012.

Table 3: Breakdown of Local Authorities by carbon dioxide emissions per capita in the domestic sector Local Authorities, 2012-2013

|                   |               | tCO <sub>2</sub> per perso | on, number of Local Aut | thorities and percentages |
|-------------------|---------------|----------------------------|-------------------------|---------------------------|
| Tonnes per person | Number of LAs | Percentage of LAs          | Number of LAs           | Percentage of LAs         |
|                   | 2012          | 2012                       | 2013                    | 2013                      |
| Less than 2       | 84            | 21%                        | 113                     | 28%                       |
| 2 - 2.5           | 276           | 68%                        | 262                     | 65%                       |
| 2.5 - 3           | 41            | 10%                        | 27                      | 7%                        |
| More than 3       | 5             | 1%                         | 4                       | 1%                        |

Source: Per capita sheet from 2005 to 2013 UK local and regional carbon dioxide emissions: full dataset Excel spreadsheet

In 2013, out of the 406 Local Authorities, domestic end-user emissions were the largest sectoral source of end-user emissions (i.e. greater than the industrial and commercial, and transport sectors) in 123 (or 30 percent of all) Local Authorities.

This sector can be influenced by the fuel types used, the type and condition of the housing (including its insulation), the average temperature (urban areas can be much warmer and therefore easier to heat than rural areas), average household size, type of household and the income and preferences of the occupiers.

#### **Transport sector**

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www.gov.uk/government/organisations/department-of-energy-climate-change/series/sub-national-energy-consumption

Transport emissions include freight and passenger transport, both private and for business purposes. The estimates are made on the basis of the distribution of traffic, therefore some of the emissions within an authority represent through traffic, or part of trips into or out of the area, whether by residents or non-residents. In some authorities this can be particularly significant, and the issue has to be borne in mind when looking at either totals or per capita estimates. The <a href="Technical Report">Technical Report</a> shows how the estimates break down between major and minor roads, to help with consideration of this point. On the end-user basis, transport emissions include a share of emissions from oil refineries.

More than three-quarters (346 out of 406) of all Local Authorities in the UK had a decrease in transport emissions between 2012 and 2013, with an overall average decrease of 1.2 percent. Since 2005, all but one Local Authority has seen a decrease in emissions from this sector. This is consistent with national trends, where transport emissions changed very little up to 2007 but have steadily decreased since then.

## Industrial, commercial and public sector

These emissions are dominated by industrial and commercial electricity consumption. The estimates are based on sub-national electricity consumption data published by DECC<sup>3</sup>, which have been used to map carbon dioxide emissions from electricity generation to the point of consumption. For some Local Authorities, emissions from large industrial installations will be the dominant factor, and these have been mapped using the National Atmospheric Emissions Inventory database of point sources.

Most Local Authorities (334 out of 406) in the UK have experienced a decrease in emissions from this sector between 2012 and 2013. This is consistent with national trends where emissions decreased due to a decrease in the use of coal and gas for electricity generation. Looking at longer term trends, all but 29 Local Authorities have seen decreases in emissions from this sector since 2005.

## Local Authorities with large changes in emissions since 2012

Overall, emissions decreased in 358 out of 406 Local Authorities between 2012 and 2013. This reflects the 2.1 percent decrease in national emissions totals between 2012 and 2013 due mainly to a decrease in the use of coal and gas for electricity generation. Table 4 shows Local Authorities that had particularly big increases or decreases in emissions and the sub-sector(s) driving this change. In Local Authorities with large decreases and increases the sub-sector largely responsible for this falls under the category 'large industrial installations'. In particular the decrease in Northumberland was due to the repurposing of the on-site power plant following closure of a large industrial site (Alcan Smelter) that was no longer sustainable and the increase from Neath Port Talbot is due to increased activity at Port Talbot steelworks.

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<sup>&</sup>lt;sup>3</sup> https://www.gov.uk/government/collections/sub-national-electricity-consumption-data

Table 4: Local Authorities that had the largest changes in emissions Local Authorities, 2012-2013

|                              |                   | Percentages                              |
|------------------------------|-------------------|--|
| Local Authority              | Percentage change | Sub-sector most responsible              |
|                              |                   | for decreases and increases in that area |
| Northumberland               | 119% decrease     | Large industrial installations           |
| <b>Dumfries and Galloway</b> | 18% decrease      | Industry and commercial electricity      |
| Cheshire West and Chester    | 16% decrease      | Large industrial installations           |
| Redcar and Cleveland         | 19% increase      | Large industrial installations           |
| Neath Port Talbot            | 47% increase      | Large industrial installations           |
|                              |                   |  |

**Table 5: Emissions by region and sub-sector** Regional Summary, 2013

|  |               |               |                                |                  |                  |                    |                   |               |               |        |          |                     |             | ktCO <sub>2</sub> |
|--|---------------|---------------|--------------------------------|------------------|------------------|--------------------|-------------------|---------------|---------------|--------|----------|---------------------|-------------|-------------------|
| Sector                                   | North<br>East | North<br>West | Yorkshire<br>and the<br>Humber | East<br>Midlands | West<br>Midlands | East of<br>England | Greater<br>London | South<br>East | South<br>West | Wales  | Scotland | Northern<br>Ireland | Unallocated | Total             |
| A. Industry and Commercial Electricity   | 3,794         | 9,863         | 7,368                          | 6,518            | 7,326            | 7,718              | 13,373            | 11,111        | 6,805         | 5,064  | 7,435    | 2,052               | 4,390       | 92,818            |
| B. Industry and Commercial Gas           | 1,817         | 5,413         | 4,658                          | 2,953            | 3,441            | 3,246              | 4,412             | 3,849         | 2,273         | 1,897  | 4,347    | 644                 | 306         | 39,256            |
| C. Large Industrial Installations        | 10,832        | 3,509         | 7,811                          | 3,507            | 1,680            | 626                | 110               | 1,187         | 161           | 8,966  | 3,366    | 552                 | 0           | 42,308            |
| D. Industrial and Commercial Other Fuels | 453           | 1,383         | 1,368                          | 1,730            | 1,479            | 1,924              | 407               | 2,091         | 1,921         | 952    | 1,525    | 2,168               | 0           | 17,401            |
| E. Agricultural Combustion               | 165           | 357           | 308                            | 351              | 367              | 337                | 9                 | 411           | 756           | 550    | 988      | 513                 | 0           | 5,112             |
| F. Domestic Electricity                  | 2,004         | 5,851         | 4,202                          | 3,796            | 4,638            | 5,352              | 6,400             | 7,844         | 5,054         | 2,530  | 5,204    | 1,276               | 268         | 54,419            |
| G. Domestic Gas                          | 3,233         | 8,245         | 6,234                          | 5,133            | 6,000            | 5,971              | 8,677             | 9,401         | 4,669         | 3,059  | 5,932    | 388                 | 143         | 67,083            |
| H. Domestic 'Other Fuels'                | 311           | 809           | 848                            | 860              | 782              | 1,008              | 108               | 1,107         | 1,094         | 1,157  | 1,122    | 2,561               | 0           | 11,768            |
| I. Transport (A roads)                   | 2,252         | 4,320         | 4,008                          | 5,018            | 4,057            | 6,201              | 4,326             | 7,314         | 4,775         | 3,008  | 4,931    | 1,875               | 0           | 52,084            |
| J. Transport (Motorways)                 | 310           | 4,673         | 2,927                          | 2,062            | 3,645            | 2,462              | 585               | 5,603         | 2,300         | 844    | 1,901    | 330                 | 0           | 27,641            |
| K. Transport (Minor roads)               | 1,593         | 3,748         | 3,153                          | 2,899            | 3,723            | 4,134              | 2,526             | 5,383         | 3,774         | 1,967  | 3,175    | 1,747               | 0           | 37,823            |
| L. Transport Other                       | 95            | 222           | 220                            | 240              | 233              | 158                | 59                | 319           | 262           | 100    | 179      | 39                  | 0           | 2,126             |
| M. Diesel Railways                       | 33            | 280           | 130                            | 159              | 368              | 291                | 142               | 300           | 132           | 79     | 125      | 40                  | 0           | 2,078             |
| N. LULUCF Net Emissions                  | -2,575        | 16            | 238                            | 240              | 280              | 553                | 26                | -125          | 485           | -535   | -4,933   | 1,465               | -1,121      | -5,988            |
| Total                                    | 24,318        | 48,688        | 43,475                         | 35,465           | 38,019           | 39,981             | 41,160            | 55,794        | 34,461        | 29,638 | 35,297   | 15,648              | 3,986       | 445,929           |

Table 6: Percentage change in emissions from 2005 to 2013 by region and sub-sector Regional Summary, 2005-2013

|   |               |               |                                |                  |                  |                    |                   |               |               |       |          |                     | ercentage |
|---|---------------|---------------|--------------------------------|------------------|------------------|--------------------|-------------------|---------------|---------------|-------|----------|---------------------|-----------|
| Sector                                      | North<br>East | North<br>West | Yorkshire<br>and the<br>Humber | East<br>Midlands | West<br>Midlands | East of<br>England | Greater<br>London | South<br>East | South<br>West | Wales | Scotland | Northern<br>Ireland | Total     |
| A. Industry and Commercial<br>Electricity   | -22%          | -18%          | -17%                           | -18%             | -17%             | -14%               | -7%               | -13%          | -18%          | -19%  | -17%     | -9%                 | -16%      |
| B. Industry and Commercial Gas              | -28%          | -14%          | -17%                           | -16%             | -19%             | -17%               | -13%              | -21%          | -25%          | -28%  | -7%      | 65%                 | -16%      |
| C. Large Industrial Installations           | -25%          | -40%          | -30%                           | -16%             | -20%             | -42%               | -22%              | -68%          | -87%          | 12%   | -22%     | -53%                | -26%      |
| D. Industrial and Commercial<br>Other Fuels | -34%          | -37%          | -25%                           | -26%             | -34%             | -21%               | -46%              | -25%          | -26%          | -27%  | -37%     | -19%                | -28%      |
| E. Agricultural Combustion                  | -11%          | -11%          | -12%                           | -12%             | -11%             | -13%               | -10%              | -12%          | -11%          | -13%  | 1%       | -9%                 | -9%       |
| F. Domestic Electricity                     | -16%          | -15%          | -18%                           | -16%             | -14%             | -15%               | -12%              | -13%          | -15%          | -14%  | -20%     | -21%                | -15%      |
| G. Domestic Gas                             | -16%          | -17%          | -14%                           | -12%             | -14%             | -10%               | -11%              | -10%          | -12%          | -17%  | -10%     | 82%                 | -12%      |
| H. Domestic 'Other Fuels'                   | -12%          | -13%          | -13%                           | -13%             | -14%             | -14%               | -14%              | -14%          | -14%          | -8%   | -16%     | -3%                 | -11%      |
| I. Transport (A roads)                      | -14%          | -17%          | -17%                           | -12%             | -15%             | -12%               | -17%              | -17%          | -15%          | -13%  | -12%     | -14%                | -15%      |
| J. Transport (Motorways)                    | -5%           | -9%           | -5%                            | -9%              | -9%              | -6%                | -1%               | -12%          | -10%          | -10%  | -4%      | -11%                | -9%       |
| K. Transport (Minor roads)                  | -15%          | -12%          | -10%                           | -8%              | -11%             | -9%                | -16%              | -11%          | -6%           | -9%   | -7%      | -5%                 | -10%      |
| L. Transport Other                          | -4%           | 2%            | 1%                             | -2%              | 1%               | -2%                | 5%                | 2%            | 1%            | 7%    | 4%       | 16%                 | 1%        |
| M. Diesel Railways                          | -6%           | 7%            | 8%                             | 9%               | 11%              | 8%                 | -4%               | 4%            | 5%            | 10%   | -2%      | 1%                  | 6%        |
| N. LULUCF Net Emissions                     | -14%          | -262%         | -16%                           | -35%             | -34%             | 2%                 | -45%              | -494%         | -34%          | -6%   | 36%      | 37%                 | 57%       |
| Total                                       | -22%          | -18%          | -18%                           | -15%             | -16%             | -13%               | -12%              | -17%          | -17%          | -10%  | -19%     | -8%                 | -16%      |

# Improvements since last year and revisions to the data for 2005 to 2012

In the production of the 2013 estimates, new data were introduced, together with some improvements to the underlying methodology. In order to ensure that the data for 2005 to 2012 are consistent with the data now available for 2013, the estimates for these years have been revised to incorporate both the new data and the improvements in the underlying methodology. For some LAs, these revisions have resulted in noticeable changes to the emissions estimates in the earlier years for some sectors. More information and specific examples are given in the Methodology Summary.

## **Industry and Commercial Electricity**

The DECC subnational 2012 non-domestic provisional data published in December 2013 were used to estimate emissions from this sector for 2012 in last year's publication. At the time it was thought these data were finalised however the publication was revised in March 2014 to include meters missing from the December 2013 publication. These meters were therefore not included in our emissions estimates for this sector for 2012 in last year's publication and resulted in an underestimate. Additional quality assurance procedures and checks have been put in place to prevent this issue in the future.

#### **Large Industrial Installations**

New sites have been identified from the EU Emissions Trading System (EU ETS) Phase 3 scope extension and there are additional exclusions of large gas users.

#### **Industrial and Commercial Other Fuels**

The time series for 2005-2012 national emissions has been updated due to new employment based mapping distribution grids.

#### **Agricultural Combustion**

The agriculture non-fuel sector now includes emissions from agricultural urea application and liming emissions (previously within the LULUCF sector).

#### **Domestic Electricity**

UK total electricity emissions from domestic to industrial commercial electricity have been reallocated due to increases in DECC subnational data for industrial and commercial sites in 2012.

## **Domestic (other fuels)**

New mapping distribution grids have an updated time series based on revisions to gas-grid and off-gas-grid postcodes.

## **Diesel Railways**

Actual fuel consumption data are now available for 2011 and 2012, where estimates were used previously.

## Land Use, Land Use Change and Forestry

Liming has been reallocated to agriculture and there are various revisions resultant from updates to drained organic soils methodologies.

## Emissions trends since 2005

When the Local Authority emissions are aggregated, estimated total carbon dioxide emissions decreased by around 16 percent between 2005 (the earliest year for which data are available at Local Authority level) and 2013 – falling from 531.9 million tonnes to 445.9 million tonnes. However, over this period there has not been a steady downward trend, with emissions increasing between 2009 and 2010 (largely due to relatively low emissions in 2009 as a consequence of economic factors) and between 2011 and 2012 (largely due to variations in temperature). For information on the drivers of trends at national level, see National Statistics on Final UK Greenhouse Gas Emissions<sup>4</sup>.

## **Regional trends since 2005**

**Table 7: End-user carbon dioxide emissions 2005 and 2013** Regional Summary, 2005 and 2013

| Region / country            | 2005                                    |                                   | 2013                                    |                                   | Percentage change                     |  |  |
|-----------------------------|---|-----------------------------------|---|-----------------------------------|---------------------------------------|--|--|
|                             | Total emissions<br>(MtCO <sub>2</sub> ) | Per capita<br>(tCO <sub>2</sub> ) | Total emissions<br>(MtCO <sub>2</sub> ) | Per capita<br>(tCO <sub>2</sub> ) | between 2005 and 2013 total emissions |  |  |
| North East                  | 31                                      | 12.2                              | 24                                      | 9.3                               | -22%                                  |  |  |
| North West                  | 60                                      | 8.7                               | 49                                      | 6.9                               | -18%                                  |  |  |
| Yorkshire and the<br>Humber | 53                                      | 10.4                              | 43                                      | 8.1                               | -18%                                  |  |  |
| East Midlands               | 42                                      | 9.6                               | 35                                      | 7.7                               | -15%                                  |  |  |
| West Midlands               | 45                                      | 8.4                               | 38                                      | 6.7                               | -16%                                  |  |  |
| East of England             | 46                                      | 8.3                               | 40                                      | 6.7                               | -13%                                  |  |  |
| Greater London              | 47                                      | 6.2                               | 41                                      | 4.9                               | -12%                                  |  |  |
| South East                  | 67                                      | 8.2                               | 56                                      | 6.3                               | -17%                                  |  |  |
| South West                  | 42                                      | 8.2                               | 34                                      | 6.4                               | -17%                                  |  |  |
| England <sup>1</sup>        | 432                                     | 8.5                               | 361                                     | 6.7                               | -16%                                  |  |  |
| Wales <sup>1</sup>          | 33                                      | 11.1                              | 30                                      | 9.6                               | -10%                                  |  |  |
| Scotland <sup>1</sup>       | 43                                      | 8.5                               | 35                                      | 6.6                               | -19%                                  |  |  |
| N. Ireland <sup>1</sup>     | 17                                      | 9.9                               | 16                                      | 8.6                               | -8%                                   |  |  |
| $UK^2$                      | 532                                     | 8.8                               | 446                                     | 7.0                               | -16%                                  |  |  |

Source: Full dataset and Per Capita sheets from 2005 to 2013 UK local and regional CO2 emissions: full dataset Excel spreadsheet

#### Note:

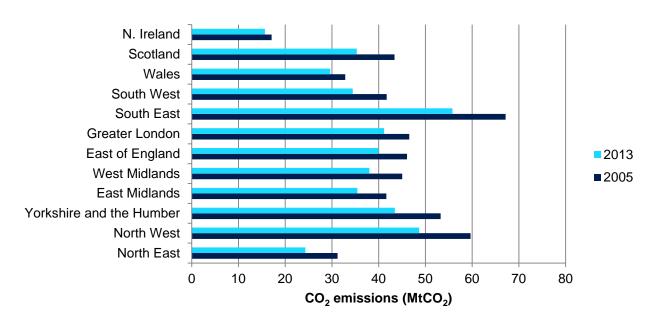
2. Sum of Local Authority emission estimates differ from the official inventory for the UK (see Table 14).

These data are not fully consistent with the equivalent data for the Devolved Administrations. A reconciliation of these sets of figures
can be found in the England Reconciliation, Wales Reconciliation, Scotland Reconciliation and Northern Ireland Reconciliation sheets
from 2005 to 2013 UK local and regional CO2 emissions: full dataset Excel spreadsheet.

<sup>&</sup>lt;sup>4</sup> https://www.gov.uk/government/publications/final-uk-emissions-estimates

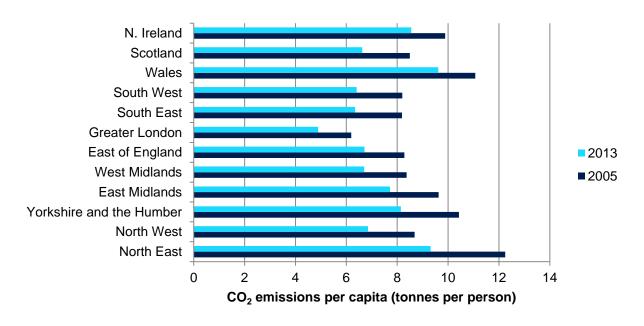
Emissions have decreased in all regions since 2005. The largest percentage decrease in emissions (22 percent) and the largest decrease in per capita terms of 2.9 tonnes per person were seen in the North East. The smallest decreases in per capita terms of 1.3 tonnes per person were seen in Greater London and Northern Ireland.

Figure 4: Regional emissions in 2005 and 2013



Source: Full dataset sheet from 2005 to 2013 UK local and regional CO2 emissions: full dataset Excel spreadsheet

Figure 5: Regional emissions per capita in 2005 and 2013



## **Local Authority trends since 2005**

There is more variation in trends at Local Authority level than at regional level. In particular, emissions for many Local Authorities are heavily influenced by activities at industrial sites, and changes at a single site can have a big impact on emissions trends.

Out of 406 Local Authorities, 399 have shown a decrease in total emissions between 2005 and 2013. This reflects the decrease in overall emissions for the UK during this period driven mainly by reductions in emissions from power stations, industrial combustion and passenger cars. The reduction from power stations is driven by change in the fuel mix used for electricity generation with a reduction in the amount of coal which is a carbon intensive fuel. The reduction in industrial combustion is largely driven by the closure or reduced activity of industrial plants, a large portion of which occurred during 2009 likely due to economic factors.

- From 2005 to 2013, the largest percentage decrease:
  - In total emissions was in Northumberland (down 112 percent). This was due to the
    conversion of a large industrial power station from generating electricity for its own use,
    to exporting electricity to national grid users. Following this, emissions from this site are
    reallocated to final users, meaning the 'Large industrial installations' sector has virtually
    zero emissions in 2013.
  - In emissions from the industrial and commercial sector was in Gravesham (down 81 percent). This was primarily due to the closure of a cement works during 2008.
  - In emissions from the domestic sector was in Knowsley (down 20 percent); and
  - In emissions from transport was in Wandsworth (down 23 percent).
- From 2005 to 2013, the largest percentage increase:
  - in total emissions was in Neath Port Talbot (up 14 percent);
  - in the industrial and commercial sector was in Slough (up 46 percent);
  - in the domestic sector was the Belfast (up 4 percent);
  - in the transport sector was Eilean Siar (up 3 percent).

**Table 8: Breakdown of size of decrease in emissions since 2005** Local Authorities, 2005 – 2013

| Change in emissions since 2005 | Number of Local  |
|--------------------------------|------------------|
|                                | A the a with a a |
|                                | Authorities      |
| Decrease of more than 20%      | 67               |
| Boordage of more than 2070     | 07               |
| Decrease of 15%-20%            | 134              |
|                                | 134              |
| Decrease of 10%-15%            | 134              |
|                                | 101              |
| Decrease of 5%-10%             | 49               |
| D (00/ 50/                     | .0               |
| Decrease of 0%-5%              | 15               |
| In and and                     |                  |
| Increase                       | 7                |
|                                |                  |

Only 7 Local Authorities had higher emissions in 2013 than in 2005 (the earliest year for which data are available), driven by increases from the industrial and commercial sector. However, for other Local Authorities there is a lot of variation in the scale of the decrease seen, as shown by the above Table 8.

## **Sub-Sectoral Trends**

When Local Authority figures are aggregated, 2013 emissions are lower than 2005 emissions in all sectors and sub-sectors except for 'Diesel Railways' and 'Transport Other'.

The 3 largest absolute decreases were in the following sub-sectors:

- Industry and commercial electricity (-17.8 million tonnes)
- Large industrial installations (-15.1million tonnes)
- Domestic electricity (-9.6 million tonnes)

#### Changes by sector at the Local Authority level

Tables 9 and 10 below provide some information on the Local Authorities that have experienced the largest percentage decreases and increases in emissions since 2005, and the sub-sectors responsible.

Table 9: Local Authorities that had the largest decreases in emissions between 2005 and 2013 Local Authorities, 2005-2013

|                       |            | Percentages                                  |
|-----------------------|------------|--|
| Local Authority       | Percentage | Sub-sector most responsible for decreases in |
|                       | decrease   | that area                                    |
| Northumberland        | -112 %     | Large industrial installations               |
| Gravesham             | -63 %      | Large industrial installations               |
| Dumfries and Galloway | -61 %      | LULUCF                                       |
| Highland              | -49 %      | LULUCF                                       |
| New Forest            | -47 %      | Large industrial installations               |

For some LAs, particularly in Scotland, a growing LULUCF (land use and land use change and forestry) sink is a big factor in the trend of their emissions. At national level, the size of the LULUCF sink increased from 2005 up to 2013. For the 2013 inventory there were methodological changes to the way LULUCF emissions were calculated, which led to the size of the LULUCF sink over the period 2005-2012 being revised downwards.

Table 10: Local Authorities that had the largest increases in emissions between 2005 and 2013 Local Authorities, 2005-2013

|                              |            | Percentages                         |
|------------------------------|------------|-------------------------------------|
| Local Authority              | Percentage | Sub-sector most responsible         |
|                              | increase   | for increases in that area          |
| Neath Port Talbot            | 14 %       | Large industrial installations      |
| Slough                       | 13 %       | Industry and commercial electricity |
| King's Lynn and West Norfolk | 8 %        | Industry and commercial gas         |
| Limavady                     | 2 %        | LULUCF                              |
| Craigavon                    | 1 %        | Industry and commercial gas         |

# Carbon dioxide emissions within the scope of influence of Local Authorities

Alongside the full dataset, we have also published a subset which represents carbon dioxide emissions within the scope of influence of Local Authorities. The full dataset includes all the emissions that occur within the boundaries of each Local Authority; however, the dataset of emissions within the scope of Local Authorities excludes emissions that Local Authorities don't have direct influence over. The emissions that are removed from the full dataset are:

- Motorways all emissions from the "Transport (motorways)" sector have been removed.
- EU Emissions Trading System (EU ETS) sites these emissions have been removed from the "Large industrial installations" sector, with the exception of energy suppliers (e.g. power stations), whose emissions are indirectly included via the end-user estimates for electricity use. Note that not all the emissions from the "Large industrial installations" sector are produced by EU ETS installations, hence the fact that there are emissions remaining in this sector in the subset.
- Diesel railways all emissions from the "Diesel Railways" sector have been excluded;
- Land Use, Land Use Change, and Forestry all emissions belonging to the "LULUCF Net emissions" sector have been excluded.

Removing these emissions has a much bigger impact on some Local Authorities than others, as some Local Authorities have a much bigger proportion of emissions from the above sources than others. Table 11 shows the Local Authorities with the largest decrease in emissions within the scope of influence of the Local Authority between 2005 and 2013. None of these were among the top 5 Local Authorities for decreases in overall emissions (which are shown in Table 9 in the previous section). This is because the largest decreases in overall emissions were driven by the large industrial installations sub-sector, large aspects of which are considered to be outside the scope of influence of LAs.

Table 11: Local Authorities that had the largest decreases in emissions within the scope of influence of the Local Authority between 2005 and 2013

Local Authorities, 2005-2013

|                  |            | Percentages                         |
|------------------|------------|-------------------------------------|
| Local Authority  | Percentage | Sub-sector most responsible         |
|                  | decrease   | for decreases in that area          |
| Isle of Anglesey | -39 %      | Large industrial installations      |
| Thurrock         | -37 %      | Industry and commercial gas         |
| Exeter           | -32 %      | Industry and commercial gas         |
| Broxtowe         | -30 %      | Industry and commercial other fuels |
| Newport          | -30 %      | Industry and commercial electricity |

Source: Indicator dataset sheet from 2005 to 2013 UK local and regional CO2 emissions: subset dataset (emissions within the scope of influence of local authorities) Excel spreadsheet

Six Local Authorities had an increase in emissions within the scope of the Local Authority between 2005 and 2013, compared with 7 Local Authorities that had an increase in their overall emissions.

Table 12: Local Authorities that had the largest increases in emissions within the scope of influence of the Local Authority between 2005 and 2013

Local Authorities, 2005-2013

|                              |            | Percentages                         |  |
|------------------------------|------------|-------------------------------------|--|
| Local Authority              | Percentage | Sub-sector most responsible         |  |
|                              | increase   | for increases in that area          |  |
| Slough                       | 25 %       | Industry and commercial electricity |  |
| King's Lynn and West Norfolk | 8 %        | Industry and commercial gas         |  |
| Craigavon                    | 5 %        | Industry and commercial gas         |  |
| Newham                       | 1 %        | Industry and commercial electricity |  |
| Moray                        | >0 %       | Industry and commercial gas         |  |

Source: Indicator dataset sheet from 2005 to 2013 UK local and regional CO2 emissions: subset dataset (emissions within the scope of influence of local authorities) Excel spreadsheet

Looking at changes in emissions within the scope of influence of Local Authorities between 2012 and 2013, 33 Local Authorities had increases in their emissions over this period. Table 13 shows the Local Authorities with the biggest percentage changes to the emissions within their scope of influence between 2012 and 2013. None of these Local Authorities appear in the list of Local Authorities with the biggest changes to overall emissions over this period (as shown in Table 4). This is because the drivers of the largest emissions changes (such as the opening or closing of large industrial installations) are often outside the scope of influence of Local Authorities.

Table 13: Local Authorities that had the largest increases or decreases in emissions within the scope of influence of the Local Authority between 2012 and 2013

Local Authorities, 2012-2013

|                         | _                 | Percentages                              |
|-------------------------|-------------------|--|
| Local Authority         | Percentage change | Sub-sector most responsible              |
|                         |                   | for decreases and increases in that area |
| Halton                  | 14 % decrease     | Large industrial installations           |
| Thurrock                | 10 % decrease     | Industry and commercial electricity      |
| Kensington and Chelsea  | 9 % decrease      | Industry and commercial gas              |
| Allerdale               | 7% increase       | Industrial and commercial gas            |
| Staffordshire Moorlands | 6% increase       | Industrial and commercial gas            |

Source: Indicator dataset sheet from 2005 to 2013 UK local and regional CO2 emissions: subset dataset (emissions within the scope of influence of local authorities) Excel spreadsheet

## Reconciliation with the UK inventory

## **Reconciliation Table**

These local estimates are designed to be as consistent as possible with the national inventory for the UK. However, some differences are unavoidable.

A number of emission sources included in the UK inventory are not included in the local estimates, as there is no obvious basis for doing so. Excluded sources are principally linked to aviation and shipping.

A small proportion of the gas and electricity consumption allocated to the domestic sector in these estimates is attributed to business in the UK inventory. This is because it is not possible to distinguish between domestic customers and smaller businesses in the meter point consumption data used in these local estimates.

Table 14 shows a summary of the reconciliation between the UK inventory and the local inventory. The different elements of this reconciliation should be interpreted as follows:

- "Excluded" are the sectors that have been deliberately excluded from the local level allocation, as it would not have been appropriate to include them;
- "Unallocated methodological differences" are differences which have become
  apparent due to the different methodological approaches used in deriving the UK
  Inventory and local level estimates. These include gas and electricity consumption which
  cannot be allocated to Local Authorities due to confidentiality concerns at high emitting
  sites, and harvested wood products.
- "Methodological differences" are the differences that have caused the discrepancies between the national inventories and the Local Authority carbon dioxide dataset. These are explained after the UK reconciliation table.

Table 14: Reconciliation of 2013 local emission estimates with UK inventory  $\ensuremath{\mathsf{UK}}, 2013$ 

|  |            | MtCO <sub>2</sub> |
|--|------------|-------------------|
|  | Details    | Totals            |
| End-user emissions allocated to local areas                            |            | 441.9             |
| Unallocated methodological differences:                                | 0.4        |                   |
| Unallocated consumption  Large electricity users with unknown location | 2.1<br>1.9 |                   |
| Total unallocated  | 1.0        | 4.0               |
| Total UK end-user emissions (local method)                             |            | 445.9             |
| Excluded from local allocation:  |            |                   |
| Domestic shipping  | 1.4        |                   |
| Domestic aviation  | 1.8        |                   |
| Military transport   | 2.5        |                   |
| Exports  | 9.0        |                   |
| International aviation and shipping                                    | 4.3        |                   |
| Total excluded   |            | 19.0              |
| Methodological differences:  |            |                   |
| Domestic sector  | -0.3       |                   |
| Industrial and commercial sector                                       | 1.3        |                   |
| Transport sector   | 0.0        |                   |
| Total methodological differences                                       |            | 1.0               |
| UK total CO₂ emissions   |            | 465.9             |
| Emissions from Crown Dependencies                                      |            | 1.5               |
| UK Greenhouse Gas Inventory total                                      |            | 467.5             |
|  |            |                   |

# Main differences between the Local Authority (LA) dataset and the Devolved Administrations (DA) datasets

This section of the report describes where there are unavoidable differences between the methodologies used in the estimation of emissions for this Local Authority carbon dioxide (CO<sub>2</sub>) emissions dataset, and for the Devolved Administration emissions datasets.

The following section sets out where and why these differences occur.

## **Gas and Electricity Consumption data**

The definitions used for domestic and industrial and commercial consumers differ between the two datasets. In the Local Authority CO<sub>2</sub> dataset, the split is as defined by the DECC subnational energy consumption dataset which are not fully consistent with the national energy data presented in Digest of UK Energy Statistics (DUKES)<sup>5</sup>. The Devolved Administration greenhouse gas inventory (DA GHGI), however, is based on DA-wide electricity consumption statistics which are available in the electricity generation and supply section of DECC's Energy Trends<sup>6</sup> publication and are fully consistent with DUKES data for major power producers. These two underlying datasets are not fully consistent, and therefore result in differences between the Local Authority dataset and the DA inventories for gas and electricity use, as described below.

Looking first at gas consumption, the sub-national energy dataset underlying the Local Authority  $CO_2$  emissions data uses the gas industry standard cut-off point of 73,200kWh (2,500 therms) and classifies consumers using under that annual consumption as domestic consumers. The data are also weather-corrected using a 17 year average. In addition, the data cover the gas year – the period covering 1 October through to the following 30 September – as opposed to the calendar year, as used in the Local Authority  $CO_2$  dataset and DUKES<sup>5</sup>. Finally, gas consumption in the Local Authority  $CO_2$  dataset is mapped using the sub-national energy consumption data, along with excluded large gas users for GB, and gas consumption data from the energy suppliers for Northern Ireland.

In respect of the DA inventory however, the underlying Energy Trends<sup>6</sup> dataset does not have the above mentioned complications. Firstly, there is no cut-off point used to differentiate between domestic and industry and commercial users. Secondly, the Energy Trends<sup>6</sup> data are not weather corrected, and are also collected annually on a calendar year basis. Finally, Energy Trends<sup>6</sup> uses all gas consumption data from the point source database with the remaining consumption mapped using a combination of sub-national gas consumption and National Atmospheric Emissions Inventory (NAEI) mapping grids.

Turning to electricity, in compiling the Local Authority CO<sub>2</sub> dataset, each meter in the subnational energy dataset is allocated a profile class, which enables consumption by domestic customers to be identified separately from consumption by industrial and commercial customers. However as part of the data validation process, all users initially identified as domestic customers with either a recorded consumption greater than 100,000kWh, or with both recorded consumption greater than 50,000kWh and address information indicating non-domestic use, are reclassified as industrial and commercial customers.

<sup>&</sup>lt;sup>5</sup> https://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes

<sup>&</sup>lt;sup>6</sup> https://www.gov.uk/government/collections/energy-trends

In respect of the DA inventory however, the nature of the Energy Trends<sup>6</sup> dataset means that this does not require any reclassification between domestic and industrial and commercial users. It should, however, be noted that the Energy Trends<sup>6</sup> dataset used in the DA inventory (with the exception of half-hourly data) covers the year 31 January 2013 to 30 January 2014. This therefore differs from the sub-national dataset used in the Local Authority  $CO_2$  estimates, which is based on a calendar year.

## **Unallocated Gas and Electricity Consumption data**

In the sub-national energy datasets, some gas data cannot be allocated to LAs, due to reasons of confidentiality. In part, these gaps in the emissions estimates are filled through the point source database (mentioned above). However, in doing so, this introduces some uncertainty. In the DA inventory though, there is no unallocated consumption; point source data is supplemented by employment and other surrogate data to allocate all of the national fuel use between the four DAs.

In the Local Authority dataset, some electricity consumption data cannot be allocated to LAs. This is due to both commercial confidentiality concerns for high-consuming sites, and also where it is not possible to map these data. In these instances, these data are therefore assigned to the 'unallocated' category. The DA inventory, on the other hand, reports emissions against a wider geographical coverage, effectively negating the data disclosure concerns, and hence there is no need to exclude specific emissions from the DA inventories.

#### **Unallocated LULUCF data**

Harvested wood products can be allocated to particular DAs but not to particular Local Authorities. Within the Local Authority carbon dioxide dataset, these emissions/removals are therefore assigned to the 'unallocated' category. These are the differences which can be seen in each of the DA reconciliation tables. All other LULUCF estimates are fully consistent across UK, DA and Local Authority data.

## Use of additional gas data for Northern Ireland

Both datasets now include consideration of new gas consumption data supplied by Northern Ireland energy suppliers, which shows a large growth in gas use within Northern Ireland from 2006 onwards. The DA inventory approach includes estimates for the fuel-switching from oil and solid fuels that this growth in gas use has displaced. In the Local Authority carbon dioxide data, these estimates of fuel switching have not been possible, given the more greater level of detail required by the data, and the UK emissions distribution grids have been used solely.

#### Distribution of 'Other Fuels' across DAs

There are some areas where emissions mapping methods differ between the two datasets due to the availability of data.

In the iron and steel sector, the methodology used for the Local Authority carbon dioxide emissions assumes that all emissions from the iron and steel sector from industrial process, process gases and solid fuels occur at large point sources. Emissions from the consumption of oil in the iron and steel sector are mapped using a combination of point sources and area sources (as described in Section 4 of the <u>Technical Report</u>). In the DA inventory, fuel use data supplied by the Iron and Steel Statistics Bureau (ISSB) is used, since it is available on a DA basis.

There is also a difference in the estimation of emissions from peat in the domestic sector. In the Local Authority carbon dioxide emissions methodology, peat use is mapped using the domestic fuel use mapping grids which are produced by AEA as part of the mapping process for the National Atmospheric Emissions Inventory programme. For the DA inventory, this is mapped using a DA specific distribution calculated by Centre for Ecology and Hydrology (CEH).

For domestic oil combustion, the allocation of emissions to Local Authorities uses separate emissions distribution grids for LPG and other oils. The mapping grids are unchanged from last year's publication. For the DA inventory, LPG grids were not available therefore all domestic oil emissions are mapped using the same distribution grid.

For domestic coal combustion, the DA inventory estimates have been revised in the latest submission to use the energy modelling work based on the 2011 census which also underpins the Local Authority CO<sub>2</sub> estimates. This has resulted in more consistent reporting between Local Authority CO<sub>2</sub> emissions and the DA inventory emissions. However, some differences remain for solid and liquid fuels due to different compilation methods and fuel aggregations; the Local Authority CO<sub>2</sub> dataset takes a more bottom-up approach to disaggregating smokeless solid fuels according to the location of smokeless zones, for example.

### Railways

Local Authority carbon dioxide emissions from railways are spatially disaggregated using data from the Department of Transport's Rail Emissions Model, as described in Section 11 of the <u>Technical Report</u>. For the DA inventory, emissions from railway locomotives in Great Britain are disaggregated based on diesel oil consumption data supplied by Association of Train Operating Companies (ATOC) for passenger services and NAEI estimates for freight services.

#### **Point Sources**

There are also some differences between the estimates of emissions at large point sources and those in the national totals. An explanation for these differences is provided in the <u>Technical</u> Report.

#### **Transport**

Since the introduction of the Department for Transport's (DfT's) Automatic Number Plate Recognition (ANPR) data into the national and mapped emissions inventories, there is now a better match between DA and Local Authority inventories. This means that DA specific fleet composition and vehicle kilometres can be used and applied directly to specific road links. The small differences still observed (~1 percent) are due to the method used for splitting vehicle kilometres between DAs. The DA inventories use data supplied by DfT and NI DRD whereas the Local Authority mapping uses road link data attributed to certain Local Authorities.

## **UK** maps

A range of maps showing 2013 carbon dioxide emissions per capita at Local Authority level are presented on the following pages. One of the maps shows carbon dioxide emissions by source on a 1km<sup>2</sup> resolution map. Data at this spatial resolution are generated as part of the NAEI programme on behalf of Defra and are published on the NAEI website:

http://naei.defra.gov.uk/data/map-uk-das.

## **Regional sectoral variations**

As Figures 7 to 10 show, emissions per capita can vary noticeably between regions in the UK. This is particularly evident in the domestic and LULUCF sectors.

As Figure 7 shows, in 2013, for the domestic sector, emissions per capita were higher in Scotland, Northern Ireland, and Wales compared than the rest of the UK. Per capita emissions are high in Northern Ireland predominantly because there is limited availability of natural gas in these areas; this results in the combustion of more carbon intensive fuels instead, such as coal, burning oil and gas oil, which are assigned to the domestic 'other fuels' sector. Wales also has a higher proportion of emissions from 'other fuels' than the rest of the UK, though to a lesser extent. In Scotland per capita emissions from both domestic gas and domestic electricity use are higher than in the rest of the UK. The lowest per capita emissions by region are in Greater London and South East England.

There are less clear trends in the industrial and commercial, and transport sectors. As Figures 8 and 9 shows, within all regions there is a mixture of areas with high, medium and low carbon dioxide emissions per capita. With respect to the industrial and commercial sector, this is expected, since emissions from this sector are heavily dependent on whether there are large industrial sites situated in that area. It is more difficult to identify reasons behind the variations observed in the transport sector, since there are numerous factors (such as composition of the vehicle fleet and average annual daily statistics by vehicle type) which feed into these estimates. Further information on how transport emissions have been estimated is available in section 10 of the <a href="Technical Report">Technical Report</a>.

In the LULUCF sector, there are clear regional trends in per capita emissions (Figure 10). In large parts of Scotland, Wales, and the North East in particular there are large sinks of carbon dioxide. In other parts of the UK, such as in Northern Ireland, East England and South West England, LULUCF is a large source of carbon dioxide emissions. Northern Ireland has the highest LULUCF emissions per capita, due to the clearing of land for the maintenance and creation of settlements and croplands.

Figure 6: Emissions of carbon dioxide per capita by Local Authority (tonnes CO<sub>2</sub> per capita), excluding LULUCF for 2013

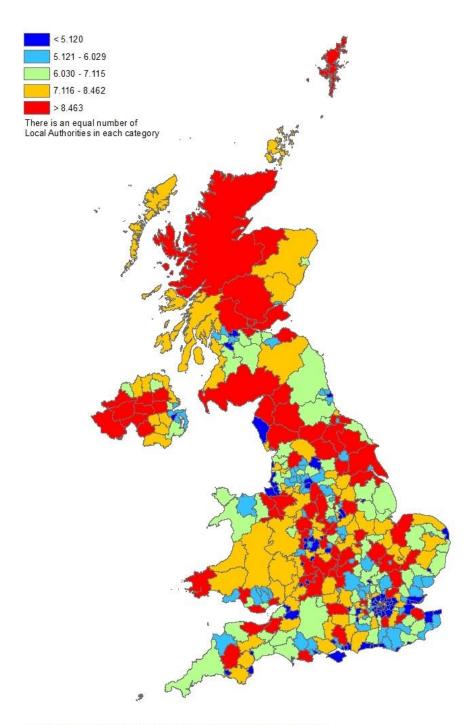


Figure 7: Domestic CO<sub>2</sub> per capita emissions by Local Authority (tonnes CO<sub>2</sub> per capita) for 2013

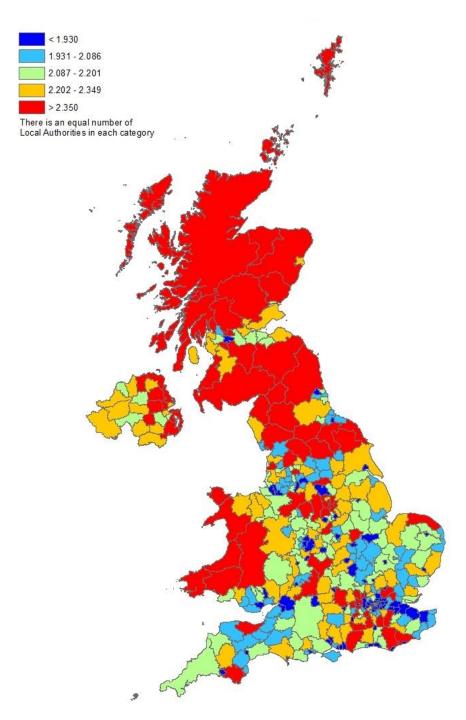


Figure 8: Industrial and commercial per capita CO<sub>2</sub> emissions by Local Authority (tonnes CO<sub>2</sub> per capita) for 2013

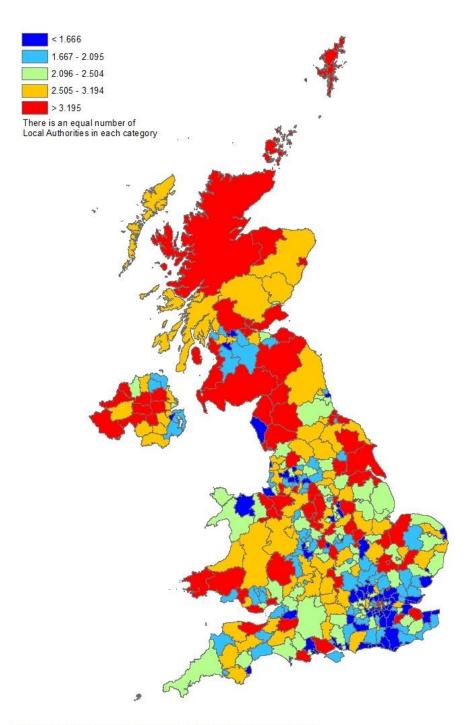


Figure 9: Transport CO<sub>2</sub> emissions per capita by Local Authority (tonnes CO<sub>2</sub> per capita) for 2013

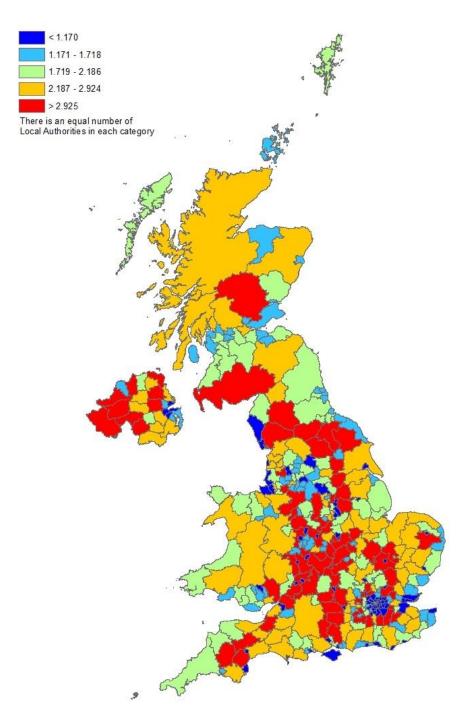


Figure 10: Land Use, Land Use Change and Forestry  $CO_2$  emissions per capita by Local Authority (tonnes  $CO_2$  per capita) for 2013

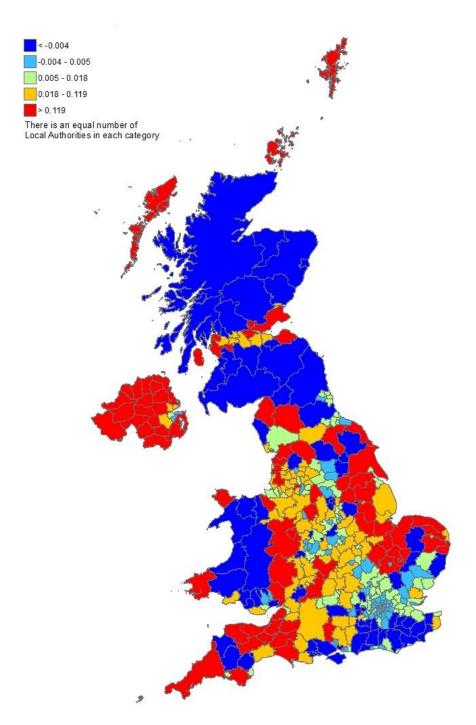
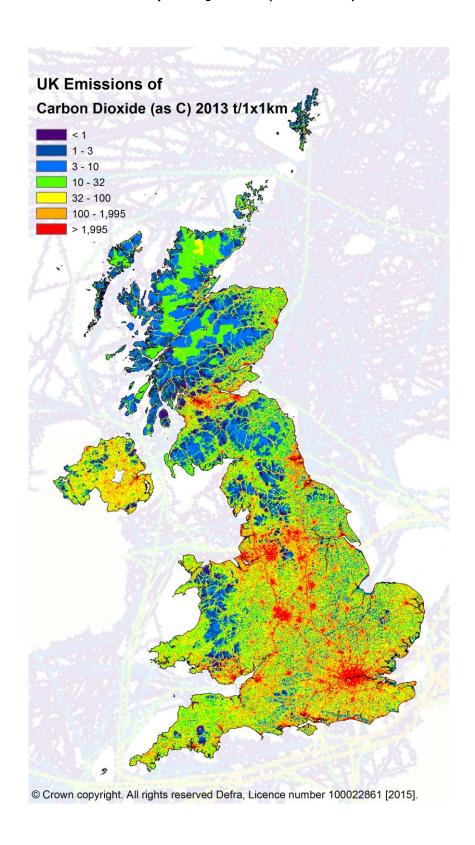


Figure 11: 1km<sup>2</sup> resolution emissions map of CO<sub>2</sub> for 2013 (exc LULUCF)



## Annex – Further Information

The following information is available alongside this statistical release at the location below.

https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-2013

Datasets are available for Local Authority emissions:

- 2005 to 2013 UK local and regional CO2 emissions estimates: full dataset
   The full dataset includes all the emissions that occur within the boundaries of each Local Authority
- 2005 to 2013 UK local and regional CO2 emissions: subset dataset (emissions within the scope of influence of Local Authorities)
   This dataset of emissions within the scope of influence of Local Authorities excludes emissions that Local Authorities don't have direct influence over.

A number of supplementary reports/datasets are also available for Local Authority emissions. These are for users to refer to if they want more information on the methodology for producing the estimates:

- 2005 to 2013 UK local and regional CO2 emissions: methodology summary Summary of the methodology used to produce the emissions estimates.
- 2005 to 2013 UK local and regional CO2 emissions: technical report
   Detailed report on the methodology used to produce the emissions estimates, for users
   who require more detail than is set out in the methodology summary.
- Employment based energy consumption mapping in the UK
  A report which outlines the methodology used to map emissions from smaller industrial and commercial sources.
- Mapping carbon emissions & removals for the Land Use, Land Use Change & Forestry (LULUCF) sector
   A report looking at LULUCF emissions and removals at the Local Authority level.
- 2013 Pollution inventory feeding into the local authority emissions datasets

  This dataset provides the pollution inventory data used in the Local Authority emissions.

The following user guidance is available for sub-national emissions:

Sub-national emissions statistics: Frequently asked questions

The following emissions outputs may also be of interest:

- <u>Devolved Administration Greenhouse Gas Inventories</u>
   Greenhouse gas emissions inventories are available for England, Scotland, Wales and Northern Ireland.
- <u>Final UK greenhouse gas emissions</u>, 1990-2013
   This publication provides the latest estimates of UK greenhouse gas emissions by source sector from 1990-2013.

Given the number of LAs, this statistical release does not provide a detailed explanation of all revisions to the historical data series or the year on year changes for each Local Authority. However, explanations of the reasons for any changes are available on request; any such requests should be sent to the following email address:

climatechange.statistics@decc.gsi.gov.uk.

## Future updates to emissions estimates

The next National Statistics on Local Authority carbon dioxide emissions estimates, covering the period 2005-2014, will be published in June 2016.

## **Notes for Editors**

- 1. The full set of data tables and methodology documents that accompany this statistics release can be found at: <a href="https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-2013">https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-2013</a>
- 2. Further information on UK greenhouse gas emissions statistics, including Excel tables with additional data on UK emissions, can be found on the Gov.uk website at: <a href="https://www.gov.uk/government/collections/uk-greenhouse-gas-emissions-statistics">https://www.gov.uk/government/collections/uk-greenhouse-gas-emissions-statistics</a>
- 3. This Statistical Release and the related data tables are part of the National Atmospheric Emissions Inventory (NAEI) for 1970-2013, produced for DECC and the Devolved Administrations by Ricardo-AEA. For further information on the UK Greenhouse Gas Inventory, see the NAEI website http://naei.defra.gov.uk/. Please note that the 2013 inventory has yet to be published due to delays in the submission to the UNFCCC, this is expected to publish by end of 2015.
- 4. The latest UK sub-national energy statistics including revisions to earlier years' data, can be found at the gov.uk website <a href="https://www.gov.uk/government/organisations/department-of-energy-climate-change/about/statistics">https://www.gov.uk/government/organisations/department-of-energy-climate-change/about/statistics</a> (scroll down the page to see a series of links to sub-national energy statistics outputs).

