



Department  
of Energy &  
Climate Change

# UK Greenhouse Gas Emissions – 1st Quarter 2014 Provisional Figures

Statistical Release: Experimental statistics

10 July 2014

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This document is also available from our website at <https://www.gov.uk/government/publications/quarterly-uk-emissions-estimates>

# Executive summary

## Introduction

DECC today publishes provisional estimates of UK greenhouse gas emissions for the year to the 1st quarter of 2014.

These estimates are “Experimental Statistics”. We would welcome any comments from users on either the estimates themselves or the underlying methodology. In particular for this publication we are inviting comments and feedback from users, further details can be found [at the end](#) of this publication.

Quarterly emissions estimates are presented as Moving Annual Total (MAT), covering the most recent four quarters. MAT aims to smooth out short-term seasonal fluctuations and highlight long term trends. Each new publication therefore provides an indication of the current trend in emissions without the effect of seasonality (see page 9 for more on methodology).

## Headline results for the year to quarter 1 2014

- Total greenhouse gas emissions have been provisionally estimated at 550.8 million tonnes carbon dioxide equivalent (MtCO<sub>2</sub>e) over the four quarters to Q1 2014, a decrease of 18.9 MtCO<sub>2</sub>e (3.3 %) compared to the year up to quarter 4 2013, when emissions were estimated to be 569.6 MtCO<sub>2</sub>e.
- On a temperature adjusted basis, greenhouse gas emissions have been provisionally estimated at 558.7 MtCO<sub>2</sub>e. This is around 0.9 per cent lower than in the four quarters to Q4 2013, when emissions were estimated to be 563.6 MtCO<sub>2</sub>e. Emissions measured on a temperature adjusted basis were higher than actual emissions. This reflects the fact that, on the whole, temperatures over the last four quarters were higher than the long term average, in particular during the first quarter of 2014, which was 1.3 degrees Celsius higher than the long term mean.
- Actual and temperature adjusted emissions are lower than in the year up to Q4 2013, due to a reduction in electricity generation overall during the first quarter of 2014 compared to the first quarter of 2013, combined with lower use of coal and gas in electricity generation. There is also a decrease in emissions from a reduction in the use of gas for space heating due to the fact that Q1 2014 was warmer than Q1 2013 by around 3.1 degrees Celsius.

# Results

## 1st quarter 2014 greenhouse gas emissions estimates

**Table 1: Emissions of all greenhouse gases and carbon dioxide only, expressed as a Moving Annual Total (MtCO<sub>2</sub>e)**

	Year to Q4 2013	Year to Q1 2014	Change
Total GHG emissions	569.6	550.8	-3.3%
Temperature adjusted GHG emissions	563.6	558.7	-0.9%
Total CO <sub>2</sub> emissions	464.0	445.2	-4.1%
Temperature adjusted CO <sub>2</sub> emissions	458.0	453.1	-1.1%

1. CO<sub>2</sub> emissions figures are for the UK and Crown Dependencies; Greenhouse gas emissions figures also include some Overseas Territories.
2. Non-CO<sub>2</sub> emissions have not been temperature adjusted.
3. The figures labelled as "Q1 2014" cover the four quarters from Q2 2013 to Q1 2014 inclusive.

**Figure 1: Actual emissions of all greenhouse gases and carbon dioxide, as a Moving Annual Total; Q1 2009 – Q1 2014 (Mt CO<sub>2</sub>e)**

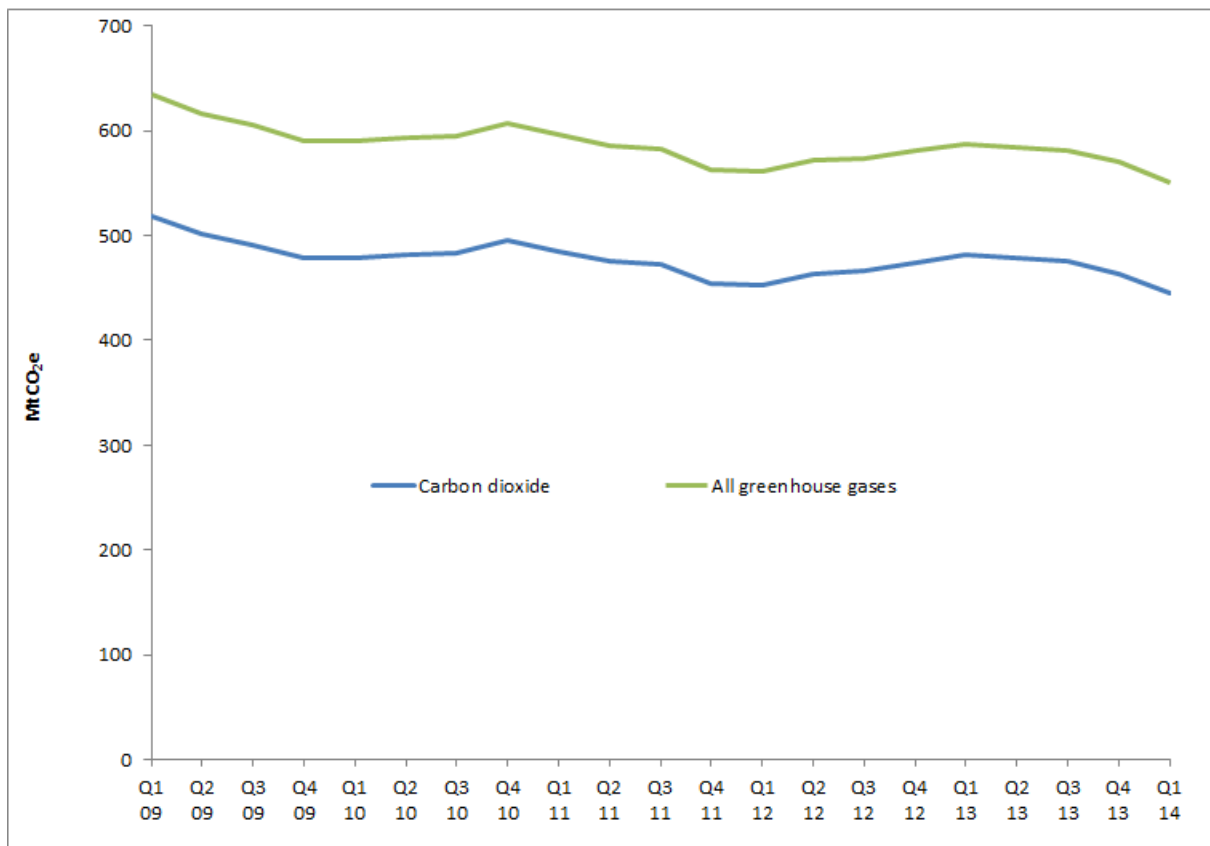
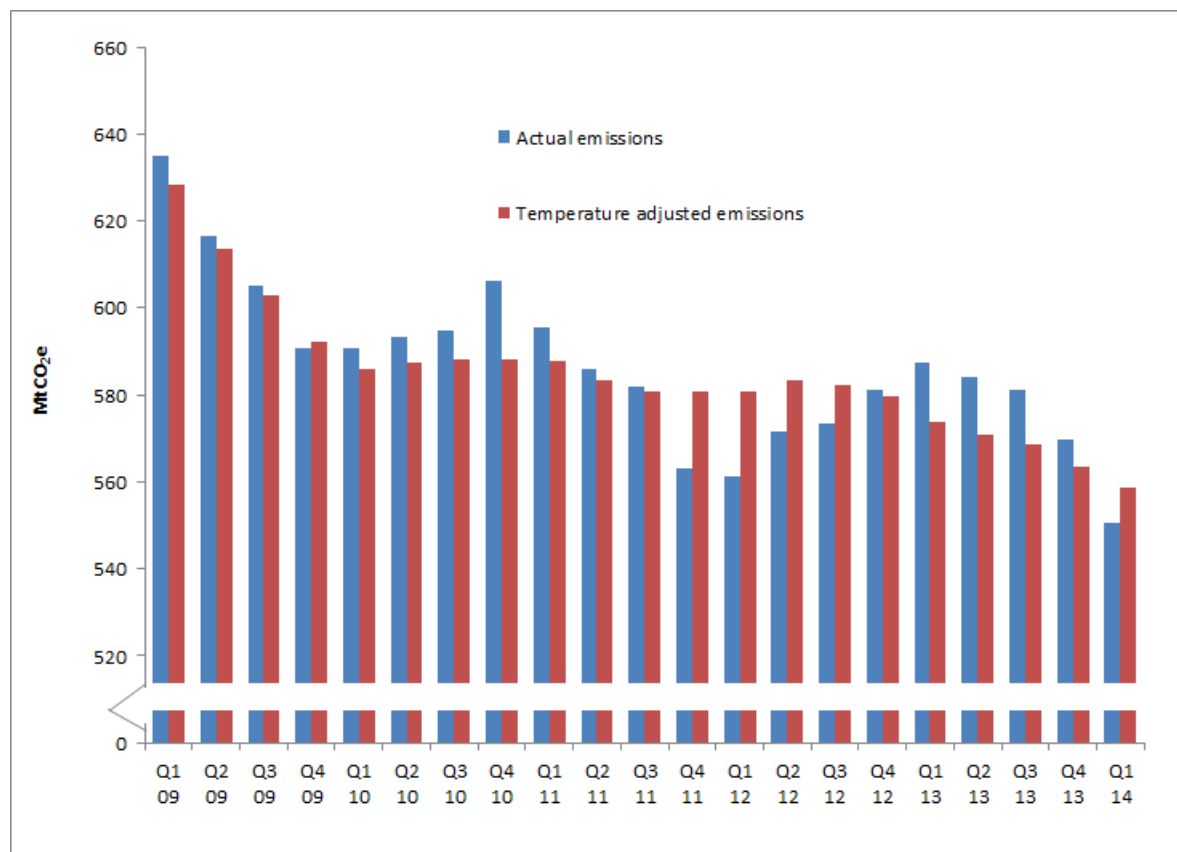


Figure 2 below shows actual and temperature adjusted greenhouse gas emissions, expressed as MAT. During 2010 and most of 2011 temperature adjusted emissions were consistently lower than actual emissions. However, this trend changed during the year to quarter 4 2011 up to the year to quarter 3 2012, where temperature adjusted emissions were higher than actual emissions. In the five quarters up to the year to quarter 4 2013, the situation reversed again as temperatures were, in general, below the long term average, resulting in temperature adjusted emissions being lower than actual emissions. For the year to Q1 2014, temperature adjusted emissions are higher than actual emissions, as temperatures have generally been higher than the long term average. In particular, the first quarter of 2014 was 1.3 degrees Celsius warmer than the long term average, and 3.3 degrees Celsius higher than the first quarter of 2013.

Comparing the year up to quarter 1 of 2014 with the year up to quarter 4 of 2013, actual and temperature adjusted emissions are both lower. The decrease comes largely from the energy supply sector, in which emissions decreased by 8.5 Mt (4.8 per cent). This was due to a decrease in electricity generation in Q1 2014 compared to Q1 2013, and also a decrease in the proportion of coal and gas used for electricity generation. For the actual emissions, the residential sector also contributed substantially to the overall decrease (by 7.4 Mt or 9.9 per cent). This decrease was due to a reduction in the use of gas for space heating due to the fact that Q1 2014 was warmer than Q1 2013 by around 3.1 degrees Celsius. For the temperature adjusted emissions, the reduction in emissions in the residential sector is much smaller (0.2 Mt or 0.3%).

**Figure 2: Actual and temperature adjusted GHG emissions, expressed as Moving Annual Total; Q1 2009 – Q1 2014 (Mt CO<sub>2</sub>e)**



## Carbon dioxide emissions by source sector – actual emissions

Table 2 below shows a summary of quarterly emissions by source sector, as a Moving Annual Total, and the changes between the year to Q4 2013 and the year to Q1 2014.

**Table 2: Sources of carbon dioxide (CO<sub>2</sub>) emissions, provisional sectoral breakdown – MAT, actual data (MtCO<sub>2</sub>)**

	Year to Q4 2013	Year to Q1 2014	Change (Mt)	Change (%)
Energy Supply	179.3	170.8	-8.5	-4.8%
Business	76.7	74.5	-2.2	-2.9%
Transport	116.0	116.3	0.3	0.2%
Public	10.6	9.9	-0.8	-7.4%
Residential	74.8	67.4	-7.4	-9.9%
Other	6.5	6.3	-0.2	-3.0%
<b>Total CO<sub>2</sub></b>	<b>464.0</b>	<b>445.2</b>	<b>-18.9</b>	<b>-4.1%</b>

1. The figures labelled as "Q1 2014" cover the four quarters from Q2 2013 to Q1 2014 inclusive.

2. Figures for "Total CO<sub>2</sub>" and "Change" may be different to the sum of those presented in the table due to rounding.

Carbon dioxide emissions decreased in most sectors, with the largest decrease in absolute terms in the energy supply sector (8.5 Mt or 4.8 per cent). Emissions in the residential sector showed the next largest decrease (7.4 Mt or 9.9 per cent). The only sector for which emissions increased was the transport sector, however this showed only a small change (0.3 Mt or 0.2 per cent).

## Carbon dioxide emissions by source sector – temperature adjusted emissions

Table 3 below shows a summary of CO<sub>2</sub> emissions by source sector, as a Moving Annual Total on a temperature adjusted basis, and the changes between the year to Q4 2013 and year to Q1 2014.

**Table 3: Sources of carbon dioxide emissions, provisional sectoral breakdown – MAT, temperature adjusted data (MtCO<sub>2</sub>)**

	Year to Q4 2013	Year to Q1 2014	Change (Mt)	Change (%)
Energy Supply	177.6	173.1	-4.5	-2.5%
Business	75.8	75.7	0.0	-0.1%
Transport	116.0	116.3	0.3	0.2%
Public	10.4	10.2	-0.2	-2.0%
Residential	71.8	71.5	-0.2	-0.3%
Other	6.5	6.3	-0.2	-3.0%
<b>Total CO<sub>2</sub></b>	<b>458.0</b>	<b>453.1</b>	<b>-4.9</b>	<b>-1.1%</b>

1. The figures labelled as “Q1 2014” cover the four quarters from Q2 2013 to Q1 2014 inclusive.

2. Figures for “Total CO<sub>2</sub>” and “Change” may be different to those presented in the table due to rounding.

Carbon dioxide emissions decreased most, in absolute terms, in the energy supply sector (4.5 Mt or 2.5 per cent). Emissions in the remaining sectors showed a small reduction from the previous quarter in absolute terms, with the exception of the transport and business sectors, which showed little change.

The sectors most influenced by temperature in absolute terms are residential and energy supply. With respect to the residential sector in particular, if temperatures increase there is a decrease in demand for space heating, resulting in a decrease in emissions. The reverse is true if temperatures decrease.

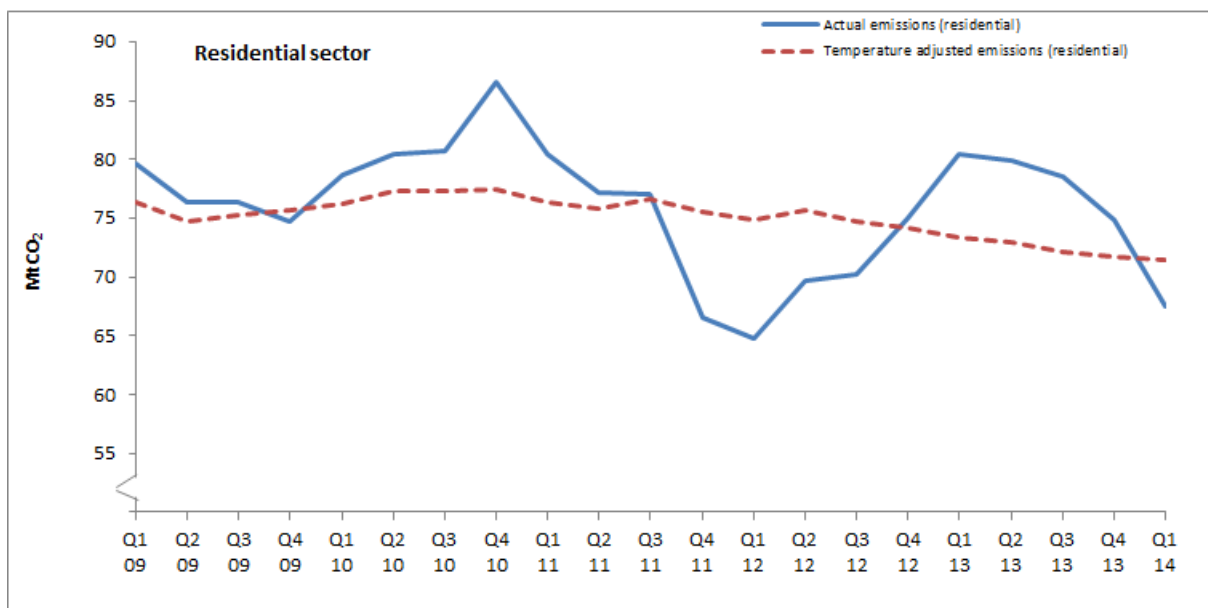
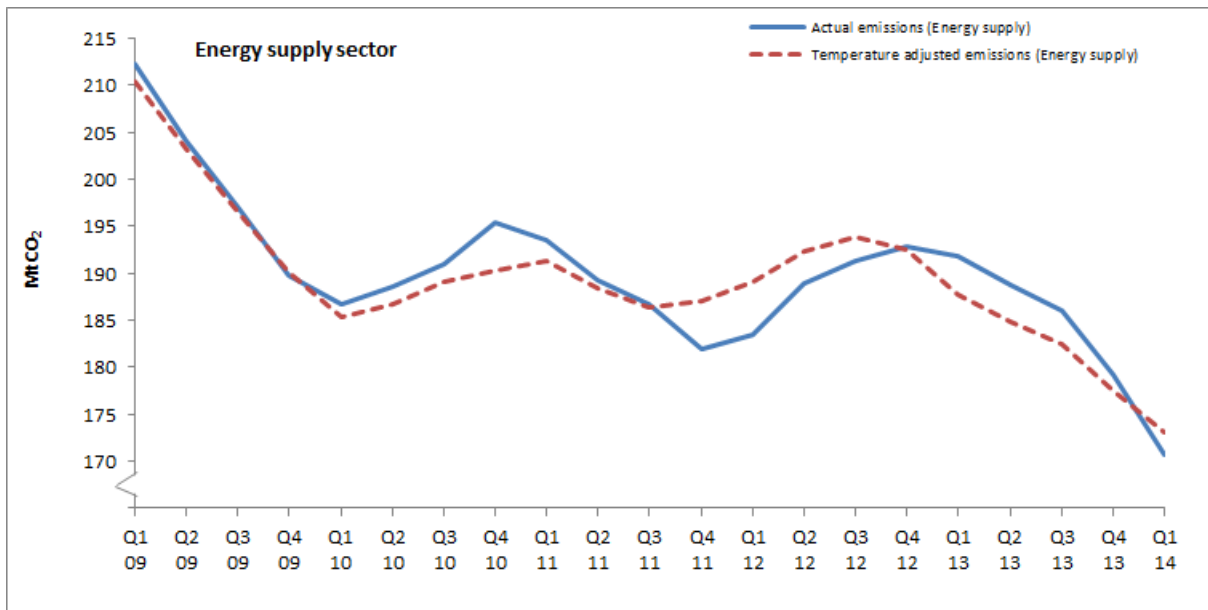
In the year to quarter 1 2014, when comparing tables 2 and 3 above, adjusting emissions for temperature increases emissions from the energy supply sector by 2.3 Mt (from 170.8 to 173.1 Mt), and from the residential sector by 4.1 Mt (from 67.4 to 71.5 Mt).

Figure 3 below shows the trend for these two sectors. As can be seen, starting from the year to quarter 1 2010 up to the year to quarter 3 2011, temperature adjusted emissions were consistently lower than actual emissions for both sectors, reflecting the fact that 2010 and the first half of 2011 were colder than average. However, this trend changed during the year to quarter 4 2011 up to the year to quarter 3 2012, where temperature adjusted emissions were higher than actual emissions. In the five quarters up to the year to quarter 4 2013, the situation

reversed again as temperatures were, in general, below the long term average. For the most recent quarter, emissions are now lower than temperature adjusted emissions due to above average temperatures during the year, particularly in Q1 2014.

In the residential sector, the difference between actual and temperature adjusted emissions is much more noticeable than in other sectors, reflecting the fact that this is the sector in which energy consumption and emissions are most sensitive to external temperatures.

**Figure 3: Energy supply and residential emissions – actual and temperature adjusted data, expressed as Moving Annual Total; Q1 2009 – Q1 2014 (MtCO<sub>2</sub>)**





# Additional Information

## Basis of the provisional quarterly emissions estimates

The estimates of carbon dioxide emissions have been produced based on provisional inland energy consumption statistics which are published in DECC's quarterly [Energy Trends](#) publication.

Carbon dioxide accounts for the majority of UK greenhouse gas emissions (82 per cent in 2012). However, in order to give an indication of what the latest provisional quarterly carbon dioxide emissions estimates imply for the total, we need to also produce an estimate of emissions of the remaining non-CO<sub>2</sub> gases. Due to the lack of availability of underlying quarterly data for the sources of emissions of these gases, they have been assumed to be the same each quarter, based on the latest full year of data. They have not been temperature adjusted; only carbon dioxide emissions have been adjusted for temperature.

## Moving Annual Total

In order to remove the seasonality in the data so that a trend in emissions over time can be observed, quarterly emissions are reported in terms of the "Moving Annual Total" (MAT). The MAT is the sum of the emissions of the four most recent consecutive quarters. When data becomes available for each new quarter, the estimates for the latest quarter are added to the MAT, while at the same time the estimates for the same quarter from the previous year are removed from the series. This procedure will smooth out short-term fluctuations and highlights long term trends, and can be used to show the underlying trend each quarter.

## Quarterly emissions estimates – temperature adjustment

Carbon dioxide emissions are indirectly influenced by external temperatures. During the winter months, emissions are generally higher than in summer months, due to higher demand for fuel for space heating. During a particularly cold winter for example, it is likely that more fuel will be burnt for domestic or commercial use than during an average winter, and therefore emissions will be higher due to the additional fuel consumption.

It is possible to adjust quarterly emissions estimates to remove the effect of external temperatures. In a particularly cold winter quarter, for example, this will result in temperature adjusted emissions being lower than actual emissions, reflecting the lower fuel consumption which would have occurred if temperatures had been at average levels (based on the 31 year period 1980-2010). Without any temperature adjustment, emissions during very cold winters will be reported at an artificially high level. The temperature adjustment to emissions has been applied for the months from September to April inclusive; in any given calendar year, it will therefore be applied in the period from January to April, and then again from September to December.

Further details of how quarterly emissions have been estimated and of the methodology underlying the temperature adjusted estimates can be found alongside this statistical release in a separate [note on the Gov.uk website](#).

## Revisions to the quarterly provisional emissions estimates

It should be noted that the quarterly emissions time series is revised each quarter to reflect any revisions made to either the underlying energy data or to the UK greenhouse gas inventory. The estimates published here are therefore provisional estimates subject to future revision.

## Future updates to quarterly provisional emissions estimates

Quarterly provisional estimates should help us to understand the latest trend in emissions, and will provide an early indication of this trend ahead of the final annual figures being available from our greenhouse gas emissions inventory. We recommend that users look at this trend rather than any absolute figures for any particular quarter.

It is important to note that these figures are based on provisional energy data and are subject to change. The sectoral breakdown is given mainly for information, and is included in the publication for completeness, but sectoral estimates are more uncertain than the total.

These estimates are “Experimental Statistics”. We would welcome any comments from users on either the estimates themselves or the underlying methodology.

The next set of quarterly statistics will be published in October 2014 and will provide a first estimate of emissions for the second quarter of 2014. Provisional annual emissions for 2014 will be published on 26<sup>th</sup> March 2015.

## Feedback and further information

The quarterly emissions estimates are “Experimental Statistics”, which means that they are new official statistics undergoing evaluation<sup>1</sup>. In order to continue to develop the publication, we are seeking feedback and comments from users of the statistics.

We’d welcome comment on any aspect of the publication, but are particularly seeking feedback on the following areas:

### **About our users**

We are interested to know more about the users of the publication, in order that we can better meet their needs.

1. Please tell us a little more about what kind of organisation you work for, and what you use this publication for.
2. How frequently do you access the publication e.g. each quarter, less often, only occasionally?
3. Do you depend on the information in this publication for any aspect of your work?

### **About the publication format**

Tell us more about what you think about the publication format:

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<sup>1</sup> <http://www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html>

4. The publication comprises a statistical release (this document); data tables in excel format; and a methodology summary. Which element(s) do you find most useful?
5. Do you find the commentary within the statistical release useful?
6. Is the presentation of information and data clear?
7. Are there any aspects of the publication which you feel could be improved?

### **About the statistics & methodology**

Tell us what you think about the content of the publication and its underlying methodology:

8. Does the information contained in the release meet your needs?
9. Is there any additional information which you would find useful?
10. Do you find the temperature corrected data useful?
11. Are the technical terms used in the publication clearly explained?
12. Do you have any comments on the methodology used?

### **How to respond**

Please send your comments regarding any or all of the above points, or any additional feedback, via email to [ClimateChange.Statistics@decc.gsi.gov.uk](mailto:ClimateChange.Statistics@decc.gsi.gov.uk) , or call us on 0300 068 8187.

Alternatively, you can write to us at the following address:

UK Greenhouse Gas Inventory and Statistics  
Area 6C  
3 Whitehall Place  
London  
SW1A 2AW

Please send us your responses by **Friday 15<sup>th</sup> August 2014**.

Further information on climate change statistics, including Excel downloads of all the data used to compile this statistical release, can be found on the Gov.uk website at:

<https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/uk-greenhouse-gas-emissions>

### **Notes for Editors**

1. The annual figures for 1990 to 2012 in this statistics release are from the National Atmospheric Emissions Inventory (NAEI), produced for DECC and the Devolved Administrations by Ricardo-AEA. For further information on the UK Greenhouse Gas Inventory, see the [NAEI web site](#).
2. Detailed UK temperature data can be found on both the [Met Office website](#) and the [Energy Statistics section of the Gov.uk website](#).

3. The complete methodology on quarterly and temperature corrected emissions can be found on the DECC climate change statistics section of the [Gov.uk website](#).
4. The basket of greenhouse gases we report for the purposes of the Kyoto Protocol consists of carbon dioxide, methane, nitrous oxide, and the three F-gases: HFCs, PFCs and SF6.
5. Any enquiries about the Energy Trends report should be sent to [energy.stats@decc.gsi.gov.uk](mailto:energy.stats@decc.gsi.gov.uk).

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