



## STATISTICAL RELEASE

### UK GREENHOUSE GAS EMISSIONS – QUARTERLY STATISTICS: 2<sup>nd</sup> QUARTER 2013 PROVISIONAL FIGURES

DECC today publishes provisional estimates of UK greenhouse gas emissions for the year to the 2<sup>nd</sup> quarter of 2013.

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

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 6 for more on methodology)

#### Headline results for the year to quarter 2 2013

- Total greenhouse gas (GHG) emissions have been provisionally estimated at 577.9 million tonnes carbon dioxide equivalent (MtCO<sub>2</sub>e) over the four quarters to Q2 2013. This was around 0.2 per cent lower than in the four quarters to Q1 2013, when emissions were estimated to be 579.0 MtCO<sub>2</sub>e.
- Total carbon dioxide (CO<sub>2</sub>) emissions have been provisionally estimated at 485.4 Mt over the four quarters to Q2 2013. This was around 0.2 per cent lower than in the previous four quarter's, when emissions were estimated to be 486.5 Mt.
- On a temperature adjusted basis, greenhouse gas emissions were provisionally estimated at 563.6 MtCO<sub>2</sub>e. This was around 0.2 per cent lower than in the previous four quarters, when emissions were estimated to be 564.6 MtCO<sub>2</sub>e. Emissions measured on a temperature adjusted basis were therefore lower than actual emissions. This reflects the fact that, on the whole, temperatures in the last four quarters were lower than the long term average.
- Actual and temperature adjusted emissions are slightly lower than the previous 4 quarters, due to lower use of coal in electricity generation being greater than increases in emissions from higher use of diesel for road vehicles and greater use of coal by industries.

These results are shown in Table 1 and Figure 1 below.

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

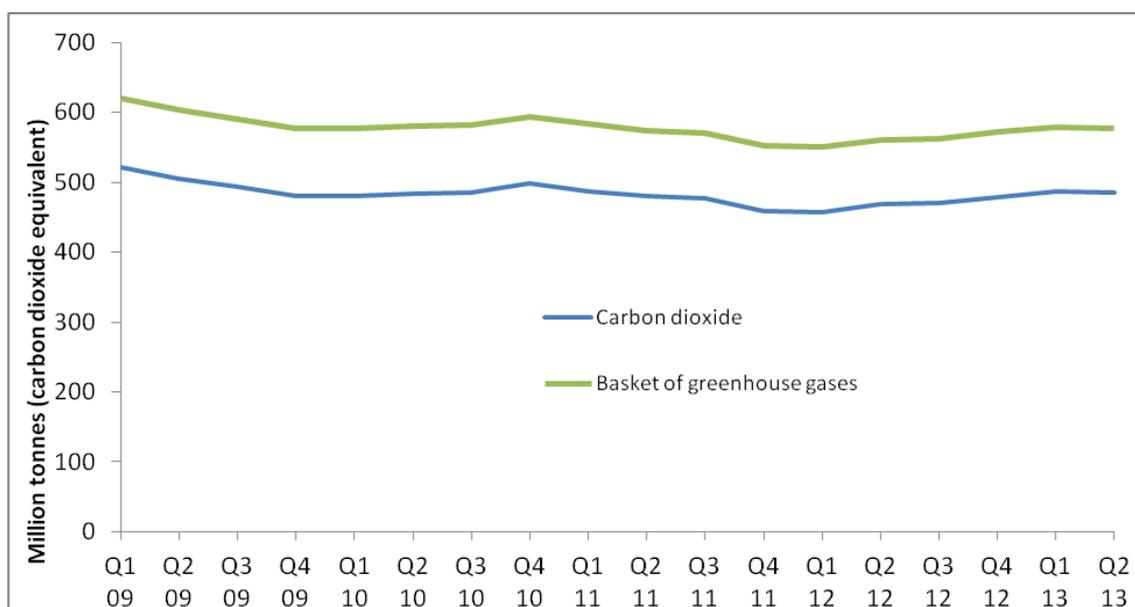
|  | Year to Q1<br>2013 | Year to Q2<br>2013 | Change |
|--|--------------------|--------------------|--------|
| Total GHG emissions                            | 579.0              | 577.9              | -0.2%  |
| Temperature adjusted GHG emissions             | 564.6              | 563.6              | -0.2%  |
| Total CO <sub>2</sub> emissions                | 486.5              | 485.4              | -0.2%  |
| Temperature adjusted CO <sub>2</sub> emissions | 472.1              | 471.1              | -0.2%  |

CO<sub>2</sub> emissions figures are for the UK and Crown Dependencies; Greenhouse gas emissions figures also include some Overseas Territories.

Non-CO<sub>2</sub> emissions have not been temperature adjusted.

The figures labelled as "Q2 2013" cover the four quarters from Q3 2012 to Q2 2013 inclusive.

**Figure 1: Actual emissions of all greenhouse gases and carbon dioxide, as a Moving Annual Total; Q1 2009 – Q2 2013 (provisional)**



## 2<sup>nd</sup> quarter 2013 greenhouse gas emissions estimates

For the year to quarter 2 2013, total greenhouse gas emissions have been provisionally estimated at 577.9 million tonnes carbon dioxide equivalent (MtCO<sub>2</sub>e). This represented a decrease of 0.2 per cent (or 1.1 MtCO<sub>2</sub>e) from the previous four quarters estimate (579.0 MtCO<sub>2</sub>e).

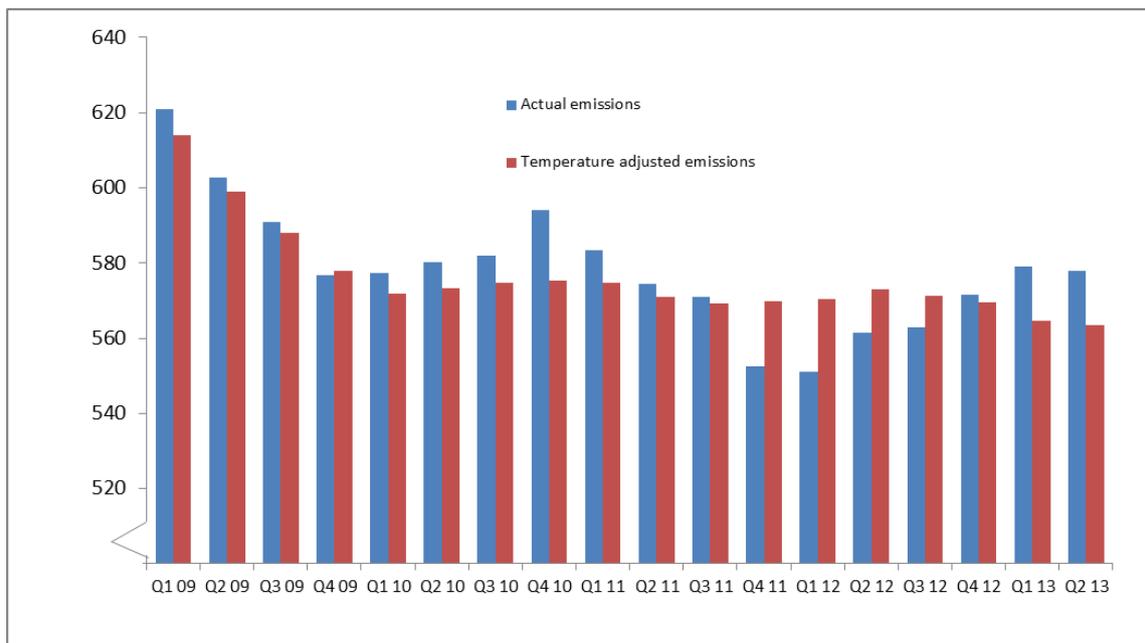
On a temperature adjusted basis, greenhouse gas emissions in the year to quarter 2 2013 were provisionally estimated at 563.6 MtCO<sub>2</sub>e. This was a decrease of 0.2 per cent (1.0 MtCO<sub>2</sub>e) from the previous four quarters (564.6 MtCO<sub>2</sub>e). Emissions measured on a temperature adjusted basis were lower than actual emissions. This reflects the fact that, on the whole, temperatures in the last year were lower than the long term average.

Figure 2 below shows actual and temperature adjusted greenhouse gas emissions, expressed as MAT. Since the first quarter of 2010, temperature adjusted emissions have gone from being lower than actual emissions (reflecting the cold winter in 2010) to being higher than actual emissions (reflecting above average temperatures in 2011). In 2012, temperatures were, in general, below the long term average. As a result the fourth quarter of 2012 saw actual emissions rise above temperature adjusted emissions for the first time since the third quarter of 2011, and continued in the following two quarters. The decrease in actual emissions in the second quarter of 2013 represents the first quarterly decrease since the first quarter of 2012.

Comparing the period to quarter 2 with the period to quarter 1 of 2013, actual and temperature adjusted emissions were slightly lower. The decrease comes largely from the energy supply sector but this was largely offset by an increase in emissions from the business and transport sectors. The relatively small change in actual emissions from the year to quarter 2 and the year to quarter 1 of 2013 largely reflects the fact that temperatures were very similar (less than 0.1 degree difference) in the second quarter of 2013 compared with the equivalent quarter in 2012.

The decrease from the energy supply sector was due to less electricity being generated, lower use of coal in electricity generation and an increase in generation from renewables. The increase from the business sector was due to higher use of coal by industries and higher consumption of coke, oven coke, coke breeze and other manufactured solid fuels in the iron and steel industry. The increase in the transport sector was down to a higher use of diesel for road vehicles which has been increasing since 2008.

**Figure 2: Actual and temperature adjusted GHG emissions, expressed as Moving Annual Total; Q1 2009 – Q2 2013 (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 Q1 2013 and year to Q2 2013.

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

|                             | Year to Q1<br>2013 | Year to Q2<br>2013 | Change (Mt) | Change (%)   |
|-----------------------------|--------------------|--------------------|-------------|--------------|
| Energy Supply               | 192.9              | 190.1              | -2.8        | -1.5%        |
| Business                    | 78.5               | 79.3               | 0.8         | 1.0%         |
| Transport                   | 115.7              | 116.6              | 0.9         | 0.8%         |
| Public                      | 7.8                | 7.9                | 0.1         | 1.3%         |
| Residential                 | 80.7               | 80.6               | -0.1        | -0.1%        |
| Other                       | 10.8               | 10.9               | 0.1         | 0.9%         |
| <b>Total CO<sub>2</sub></b> | <b>486.5</b>       | <b>485.4</b>       | <b>-1.1</b> | <b>-0.2%</b> |

Note: the figures labelled as “Q2 2013” cover the four quarters from Q3 2012 to Q2 2013 inclusive.

Carbon dioxide emissions decreased most, in absolute and percentage terms, in the energy supply sector (by 2.8 Mt or 1.5 per cent). Emissions in the transport and the business sectors increased by 0.9 Mt (0.8 per cent) and 0.8 Mt (1.0 per cent) respectively. Emissions in the remaining sectors showed a very little change from the previous quarter.

## 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 Q1 2013 and year to Q2 2013.

**Table 3: Sources of carbon dioxide emissions, provisional sectoral breakdown – MAT, temperature adjusted data (Mt)**

|                             | Year to Q1<br>2013 | Year to Q2<br>2013 | Change<br>(Mt) | Change (%)   |
|-----------------------------|--------------------|--------------------|----------------|--------------|
| Energy Supply               | 188.8              | 186.0              | -2.8           | -1.5%        |
| Business                    | 76.1               | 76.9               | 0.8            | 1.1%         |
| Transport                   | 115.7              | 116.6              | 0.9            | 0.8%         |
| Public                      | 7.2                | 7.3                | 0.1            | 1.4%         |
| Residential                 | 73.5               | 73.4               | -0.1           | -0.1%        |
| Other                       | 10.8               | 10.9               | 0.1            | 0.9%         |
| <b>Total CO<sub>2</sub></b> | <b>472.1</b>       | <b>471.1</b>       | <b>-1.0</b>    | <b>-0.2%</b> |

Note: the figures labelled as “Q2 2013” cover the four quarters from Q3 2012 to Q2 2013 inclusive.

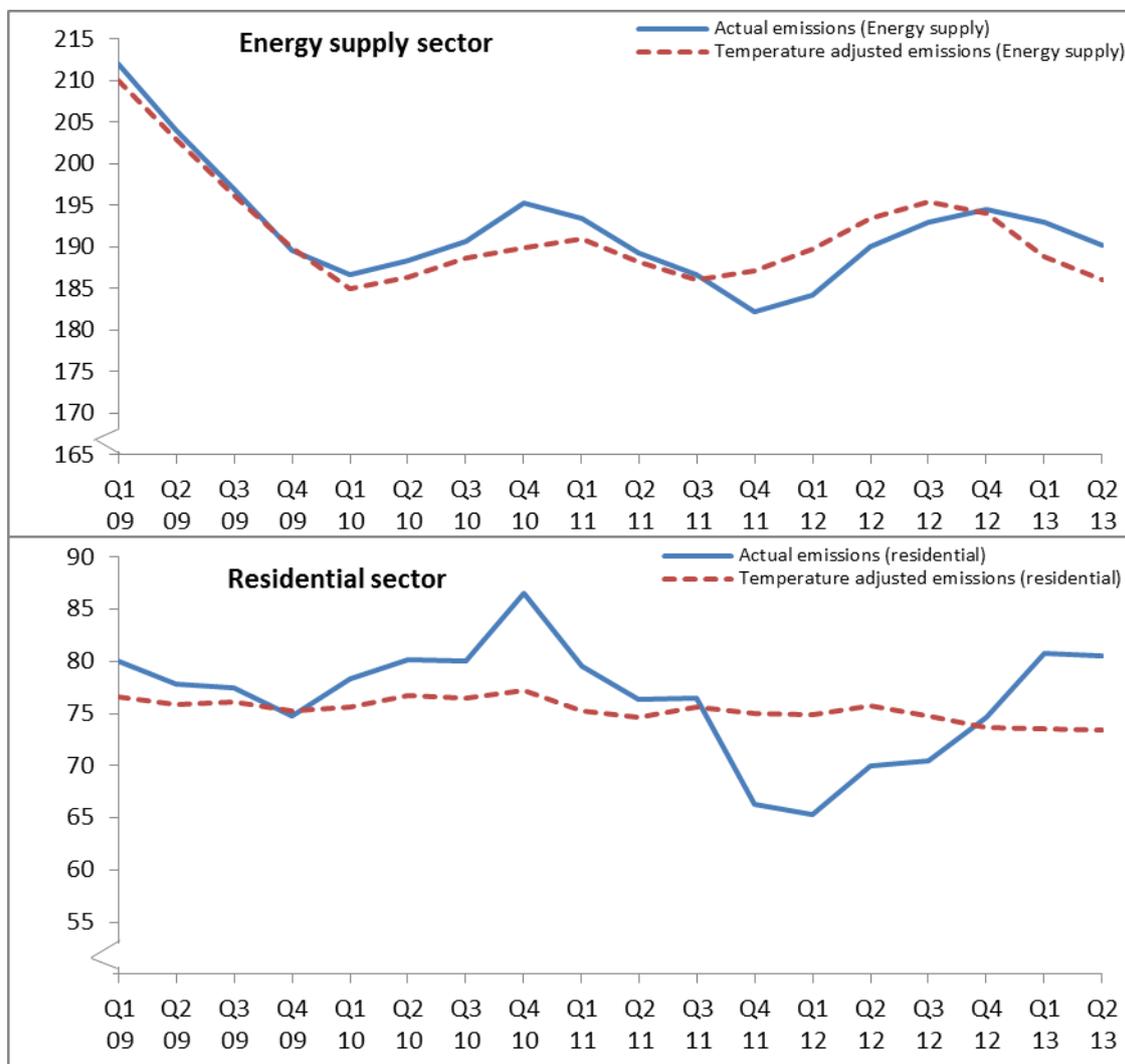
The sectors most influenced by temperature are residential and energy supply. With respect to the residential sector in particular, if temperatures increase there is a decrease in demand for space heating, resulting in a decrease in emissions. The reverse is true if temperatures decrease.

In the year to quarter 2 2013, when comparing tables 2 and 3 above, adjusting emissions for temperature decreases emissions from the energy supply sector of 4.1 Mt (from 192.9 to 186.0 Mt), and from the residential sector of 7.2 Mt (from 80.6 to 73.4 Mt), allowing for rounding.

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 most recent three quarters, the year to quarter 4 2012 up to the year to quarter 2 2013, the situation has reversed again, and actual emissions are now higher than temperature adjusted emissions.

In the residential sector, the difference between actual and temperature adjusted emissions was 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 – Q2 2013 (Mt)**



## **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 (83 per cent in 2011). 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 32 year period 1980-2011). 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 will be revised each quarter to reflect any revisions made to either the underlying energy data or to the UK greenhouse gas inventory.

## **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.

The next set of quarterly statistics will be published in January 2013 and will provide a first estimate of emissions for the third quarter of 2013.

## **Feedback and further information**

These estimates should be treated as “Experimental Official Statistics”. We would welcome any comments from users on either the estimates themselves or the underlying methodology.

Any enquiries or comments should be sent to DECC’s UK Greenhouse Gas Emissions Statistics and Inventory Team at:

[ClimateChange.Statistics@decc.gsi.gov.uk](mailto:ClimateChange.Statistics@decc.gsi.gov.uk)

Contact telephone: 0300 068 2948

The lead statistician for this publication is Helen Champion.

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 2011 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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