



Department
of Energy &
Climate Change

UK Greenhouse Gas Emissions – 3rd Quarter 2013 Provisional Figures

Statistical Release: Experimental statistics

16 January 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 3rd quarter of 2013.

These estimates are “Experimental 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 9 for more on methodology)

Headline results for the year to quarter 3 2013

- Total greenhouse gas (GHG) emissions have been provisionally estimated at 576.2 million tonnes carbon dioxide equivalent (MtCO₂e) over the four quarters to Q3 2013. This is around 0.3 per cent lower than in the four quarters to Q2 2013, when emissions were estimated to be 577.6 MtCO₂e.
- Total carbon dioxide (CO₂) emissions have been provisionally estimated at 483.7Mt over the four quarters to Q3 2013. This is around 0.3 per cent lower than in the previous four quarters, when emissions were estimated to be 485.1Mt.
- On a temperature adjusted basis, greenhouse gas emissions have been provisionally estimated at 563.1MtCO₂e. This is very close to the estimate for the previous four quarters, when emissions were estimated to be 563.3 MtCO₂e. Emissions measured on a temperature adjusted basis were therefore lower than actual emissions. This reflects the fact that, on the whole, temperatures over the last four quarters were lower than the long term average.
- Actual and temperature adjusted emissions are slightly lower than in the year up to Q2 2013, due to lower use of coal in electricity generation in Q3 2013 compared to Q3 2012.

Results

3rd quarter 2013 greenhouse gas emissions estimates

Table 1: Emissions of all greenhouse gases and carbon dioxide only, expressed as a Moving Annual Total (MtCO₂e)

	Year to Q2 2013	Year to Q3 2013	Change
Total GHG emissions	577.6	576.2	-0.3%
Temperature adjusted GHG emissions	563.3	563.1	-0.0%
Total CO ₂ emissions	485.1	483.7	-0.3%
Temperature adjusted CO ₂ emissions	470.8	470.6	-0.1%

1. CO₂ emissions figures are for the UK and Crown Dependencies; Greenhouse gas emissions figures also include some Overseas Territories.
2. Non-CO₂ emissions have not been temperature adjusted.
3. The figures labelled as "Q3 2013" cover the four quarters from Q2 2012 to Q3 2013 inclusive.

Figure 1: Actual emissions of all greenhouse gases and carbon dioxide, as a Moving Annual Total; Q1 2009 – Q3 2013 (Mt CO₂e)

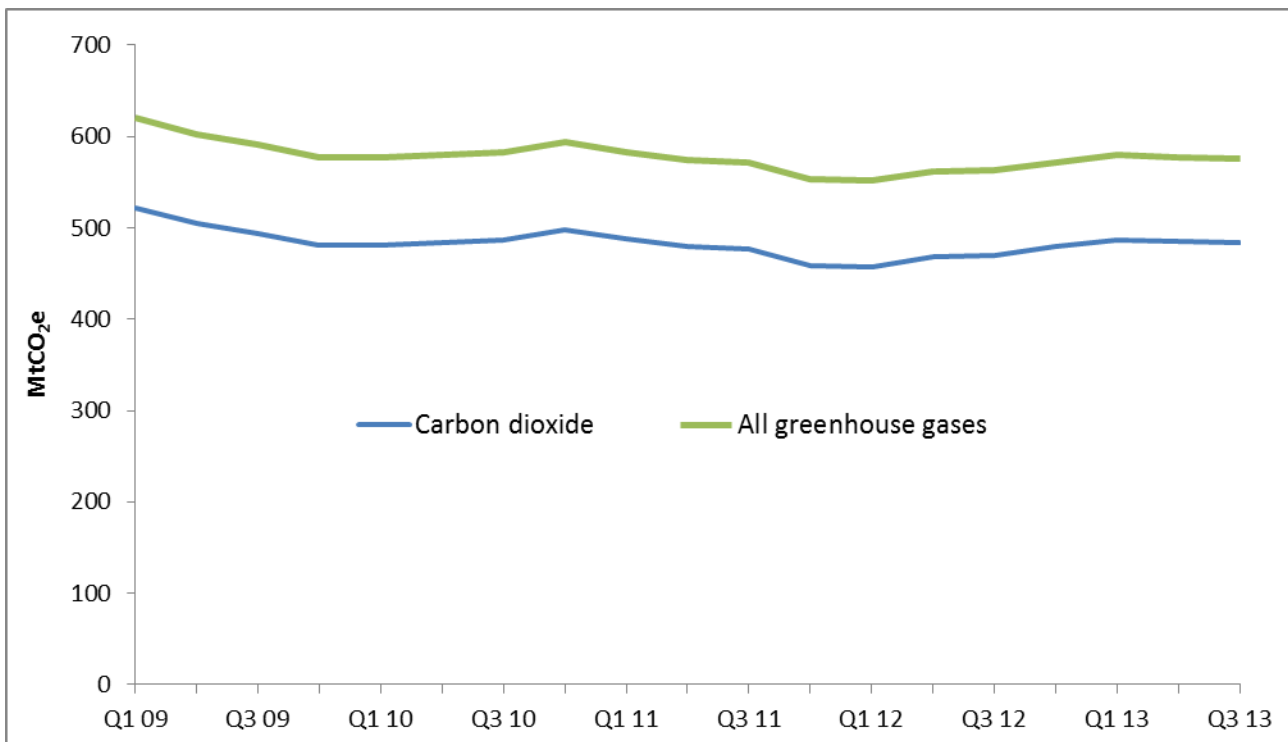
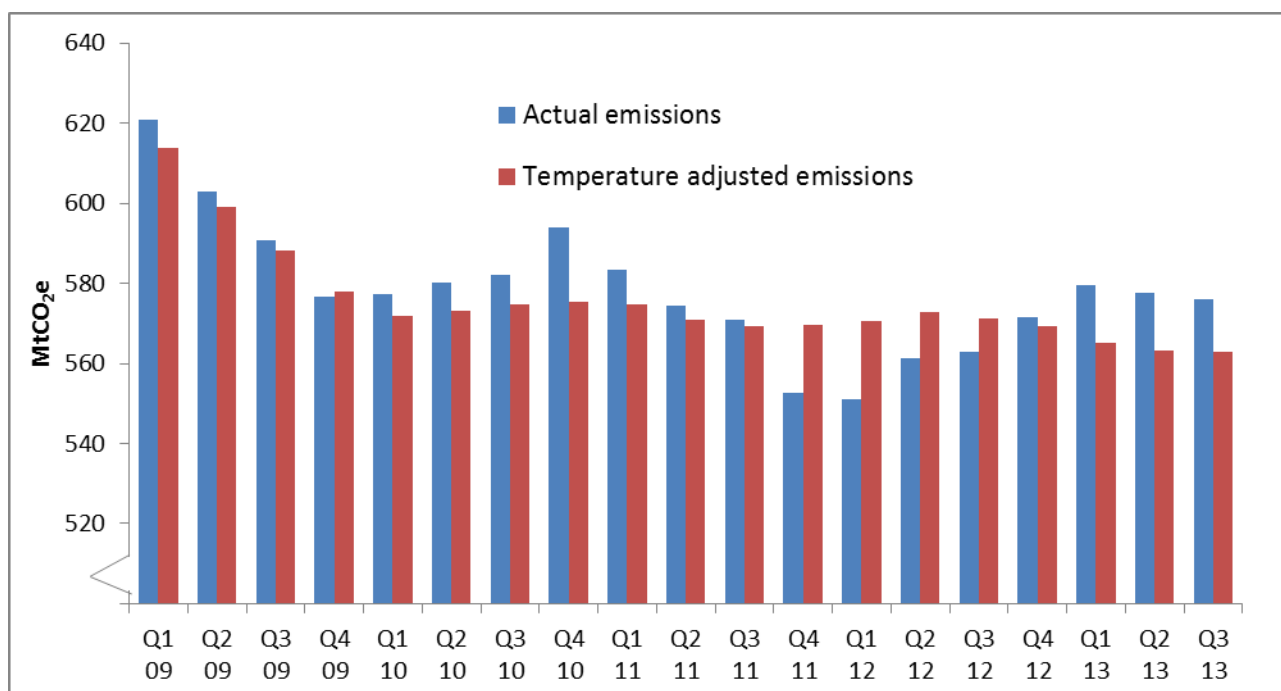


Figure 2 below shows actual and temperature adjusted greenhouse gas emissions, expressed as MAT. During 2010 and most of 2011 temperature adjusted emissions were lower than actual emissions (reflecting the cold winter in 2010), while from the fourth quarter of 2011 to the third quarter of 2012 they were higher than actual emissions (reflecting above average temperatures in 2011). In 2012, temperatures were, in general, below the long term average. As a result since the fourth quarter of 2012, actual emissions have been higher than temperature adjusted emissions. Comparing the year up to quarter 3 of 2013 with the year up to quarter 2 of 2013, actual and temperature adjusted emissions are both slightly lower. The decrease comes largely from the energy supply sector, though this is partially offset by an increase in emissions from the business sector.

The decrease in emissions 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.

Figure 2: Actual and temperature adjusted GHG emissions, expressed as Moving Annual Total; Q1 2009 – Q3 2013 (Mt CO₂e)



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 Q2 2013 and year to Q3 2013.

Table 2: Sources of carbon dioxide (CO₂) emissions, provisional sectoral breakdown – MAT, actual data (MtCO₂)

	Year to Q2 2013	Year to Q3 2013	Change (Mt)	Change (%)
Energy Supply	189.8	186.8	-3.0	-1.6%
Business	79.5	81.4	1.9	2.4%
Transport	116.6	116.6	0.0	0.0%
Public	7.8	7.9	0.0	0.0%
Residential	80.5	79.8	-0.7	-0.9%
Other	10.9	11.2	0.3	3.1%
Total CO₂	485.1	483.7	-1.5	-0.3%

1. The figures labelled as “Q3 2013” cover the four quarters from Q4 2012 to Q3 2013 inclusive.

Carbon dioxide emissions decreased most, in absolute and percentage terms, in the energy supply sector (by 3.0 Mt or 1.6 per cent). Emissions in the business sector increased by 1.9 Mt (2.4 per cent). Emissions in the remaining sectors showed little change from the previous quarter in absolute terms.

Carbon dioxide emissions by source sector – temperature adjusted emissions

Table 3 below shows a summary of CO₂ emissions by source sector, as a Moving Annual Total on a temperature adjusted basis, and the changes between the year to Q2 2013 and year to Q3 2013.

Table 3: Sources of carbon dioxide emissions, provisional sectoral breakdown – MAT, temperature adjusted data (MtCO₂)

	Year to Q2 2013	Year to Q3 2013	Change (Mt)	Change (%)
Energy Supply	185.7	183.1	-2.7	-1.4%
Business	77.0	79.1	2.1	2.7%
Transport	116.6	116.6	0.0	0.0%
Public	7.3	7.3	0.1	0.7%
Residential	73.3	73.2	-0.1	-0.2%
Other	10.9	11.2	0.3	3.1%
Total CO₂	470.8	470.6	-0.3	-0.1%

1. The figures labelled as “Q3 2013” cover the four quarters from Q4 2012 to Q3 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.

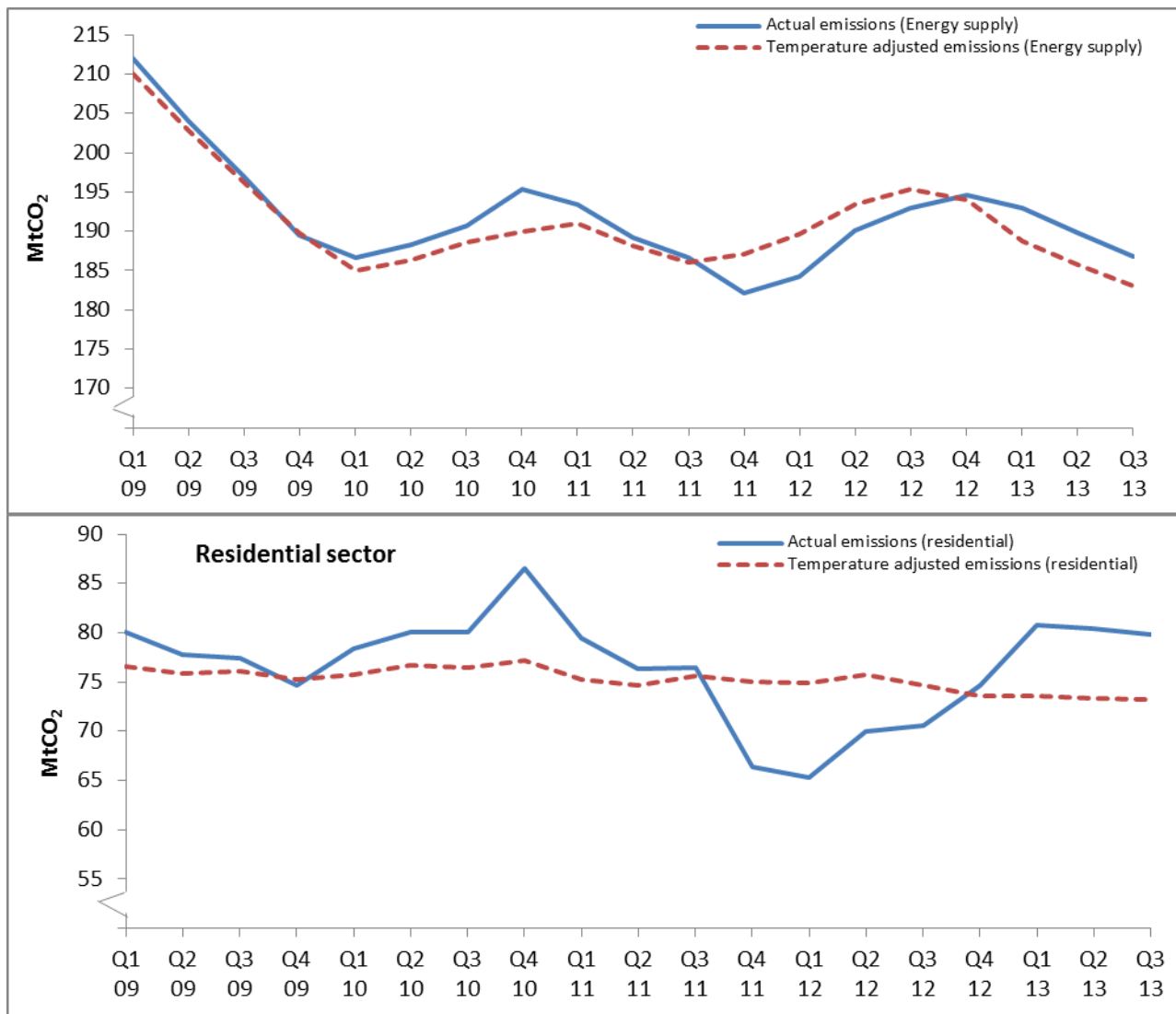
In the year to quarter 3 2013, when comparing tables 2 and 3 above, adjusting emissions for temperature decreases emissions from the energy supply sector of 3.8 Mt (from 186.8 to 183.1 Mt), and from the residential sector of 6.6 Mt (from 79.8 to 73.2 Mt)¹.

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 four quarters, the year to quarter 4 2012 up to the year to quarter 3 2013, the situation has reversed again as temperatures were, in general, below the long term average, and actual emissions are now higher than temperature adjusted emissions.

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.

¹ Figures may not sum when using the data presented in the table due to rounding.

Figure 3: Energy supply and residential emissions – actual and temperature adjusted data, expressed as Moving Annual Total; Q1 2009 – Q3 2013 (MtCO₂)



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 (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-CO₂ 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 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 April 2014 and will provide a first estimate of emissions for the fourth quarter of 2013. Provisional annual emissions for 2013 will be published on 27th March 2014.

Feedback and further information

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.

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