



28<sup>th</sup> March 2013

## STATISTICAL RELEASE

### **2012 UK GREENHOUSE GAS EMISSIONS, PROVISIONAL FIGURES AND 2011 UK GREENHOUSE GAS EMISSIONS, FINAL FIGURES BY FUEL TYPE AND END-USER**

DECC today publishes provisional 2012 estimates of UK greenhouse gas emissions, together with final estimates of 2011 UK greenhouse gas emissions by fuel type and end-user.

#### **Greenhouse gas emissions – 2012 headline results**

- In 2012, UK emissions of the basket of six greenhouse gases covered by the Kyoto Protocol were provisionally estimated to be 571.6 million tonnes carbon dioxide equivalent. This was 3.5 per cent higher than the 2011 figure of 552.6 million tonnes.
- Carbon dioxide (CO<sub>2</sub>) is the main greenhouse gas, accounting for about 83 per cent of total UK greenhouse gas emissions in 2011, the latest year for which final results are available. In 2012, UK net emissions of carbon dioxide were provisionally estimated to be 479.1 million tonnes (Mt). This was 4.5 per cent higher than the 2011 figure of 458.6 Mt.
- Between 2011 and 2012, there were increases in CO<sub>2</sub> emissions from most of the main sectors. The provisional estimates show increases in emissions of 5.5 per cent (9.9 Mt) from the energy supply sector, 11.8 per cent (7.8 Mt) from the residential sector, and 4.8 per cent (3.6 Mt) from the business sector. Emissions from the transport sector were down by 1.2 per cent (1.4 Mt) from 2011. All these sectoral breakdowns are based on the source of the emissions, as opposed to where the end-user activity occurred. Emissions related to electricity generation are therefore attributed to power stations, the source of these emissions, rather than homes and businesses where electricity is used.
- The increase in CO<sub>2</sub> emissions between 2011 and 2012 resulted primarily from lower use of gas and greater use of coal for electricity generation at power stations, combined with an increase in residential gas use.

The headline results are shown in Table 1 and Figure 1 below. The time series for selected years since 1990 is shown in Table 17 towards the end of this statistical release.

**Table 1: Emissions of greenhouse gases (MtCO<sub>2</sub>e)**

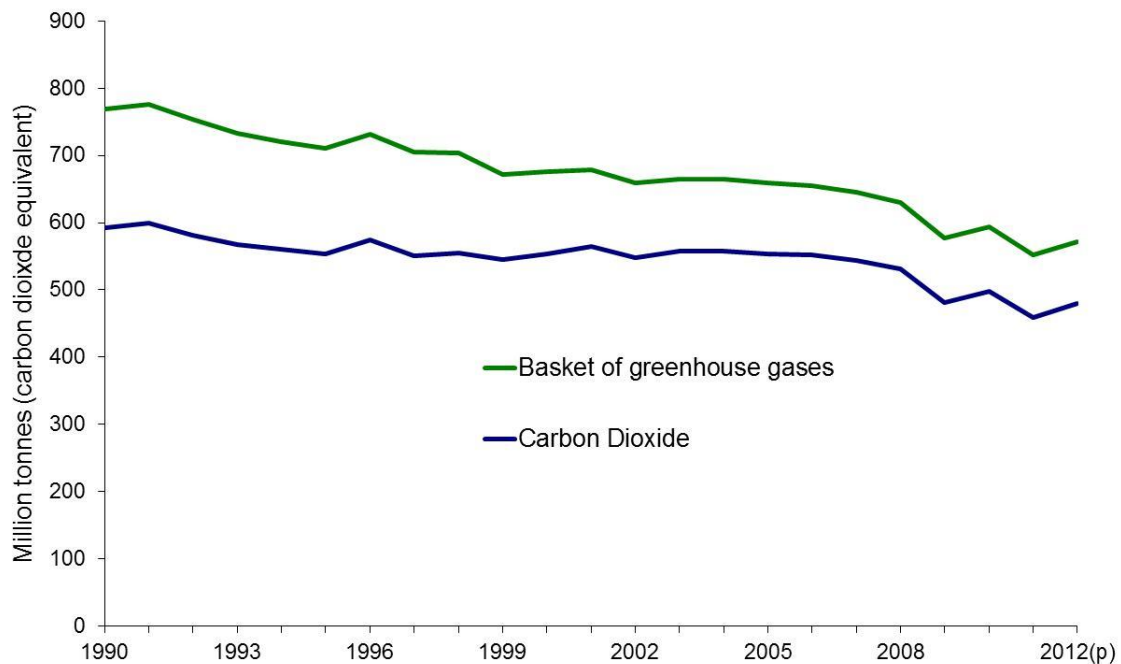
	2011	2012(p)	Change
Total greenhouse gas emissions	552.6	571.6	+3.5%
Carbon dioxide emissions	458.6	479.1	+4.5%

(p) 2012 estimates are provisional

Carbon dioxide emissions figures are for the UK and Crown Dependencies; Total greenhouse gas emissions figures also include some Overseas Territories.

Emissions are reported as *net* emissions, to include removals from the atmosphere by carbon sinks.

**Figure 1: Emissions of greenhouse gases, 1990-2012 (provisional)**



## Coverage of emissions reporting

The basket of greenhouse gases covered by the Kyoto Protocol consists of six gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride. In accordance with international reporting and carbon trading protocols, each of these gases is weighted by its *global warming potential* (GWP), so that total greenhouse gas emissions can be reported on a consistent basis. The GWP for each gas is defined as its warming influence relative to that of carbon dioxide. Greenhouse gas emissions are then presented in *carbon dioxide equivalent* units.

Carbon dioxide is reported in terms of *net* emissions, which means total emissions minus total removals of CO<sub>2</sub> from the atmosphere by *carbon sinks*. Carbon sinks are incorporated within the Land Use, Land Use Change and Forestry (LULUCF) sector, which covers afforestation, reforestation, deforestation and forest management. They are defined by the United Nations

Framework Convention on Climate Change (UNFCCC) as “any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas from the atmosphere”.

Unless otherwise stated, any figures included in this release represent emissions within the UK and its Crown Dependencies (Jersey, Guernsey, and the Isle of Man).

Reporting of greenhouse gas emissions under the Kyoto Protocol is based on emissions in the UK, its Crown Dependencies, and those Overseas Territories (Bermuda, Cayman Islands, Falkland Islands, Gibraltar and Montserrat) that are party to the UK ratification of the Kyoto Protocol. The Kyoto Protocol also uses a narrower definition of carbon sinks than that applied for domestic UK CO<sub>2</sub> reporting, which therefore results in a slightly different total. These adjustments mean that the greenhouse gas basket reported for Kyoto differs slightly from the sum of the individual gases as shown.

### **Basis of the provisional 2012 estimates**

Provisional estimates of carbon dioxide emissions are produced based on provisional inland energy consumption statistics which are being published today in DECC’s quarterly [Energy Trends](#) publication. Details of the provisional energy consumption statistics which have been used to estimate emissions can be found in *Energy Trends*.

Carbon dioxide accounts for the majority of the basket of UK greenhouse gas emissions (83 per cent in 2011). However, in order to give an indication of what the latest provisional carbon dioxide emissions estimates imply for the basket total, we need to also produce an estimate of emissions of the remaining gases in the basket. This estimate is based on a simple approach which assumes that the trend for these gases will be half-way between no change on 2011 and a repeat of the trend indicated by the last 12 years’ data (2000-2011).

Finally, in order to establish an estimate of total emissions which is consistent with the Kyoto Protocol definition for the basket as a whole, a further adjustment is made in respect of emissions from Overseas Territories and the narrower definition of carbon sinks used by the Protocol.

These provisional emissions estimates will be subject to revision when the final estimates are published in early 2014; however, they provide an early indication of emissions in the most recent full calendar year. The majority of provisional estimates are within 1.5 per cent of the final figures.

To ensure consistency with other National Statistics publications on UK greenhouse gas emissions, the sectoral breakdowns in this statistical release are based on the UK’s *National Communication* sectors, by which we report our greenhouse gas emissions to the UNFCCC.

## **2012 carbon dioxide emissions by source sector**

Carbon dioxide (CO<sub>2</sub>) accounted for about 83 per cent of the UK's anthropogenic (man-made) greenhouse gas emissions in 2011.

In 2012, an estimated 40 per cent of carbon dioxide emissions were from the energy supply sector, 24 per cent from transport, 17 per cent from business and 15 per cent from the residential sector.

Between 2011 and 2012, provisional estimates indicate that CO<sub>2</sub> emissions increased by 5.5 per cent (9.9 Mt) in the energy supply sector, 11.8 per cent (7.8 Mt) in the residential sector and 4.8 per cent (3.6 Mt) in the business sector. Emissions from the transport sector were down by 1.2 per cent (1.4 Mt) from 2011.

Since 1990, there has been a decrease in UK carbon dioxide emissions of around 19 per cent. This fall in emissions has been accompanied by a decrease in overall energy consumption over the period, of around 3 per cent. If this figure is adjusted to allow for the effect of temperature, energy consumption has fallen by around 6 per cent between 1990 and 2012. A number of factors explain this effect, such as changes in the efficiency in electricity generation and switching from coal to less carbon intensive fuels such as gas.

Table 2 and Figure 2 below show the breakdown of carbon dioxide emissions into the main source sectors.

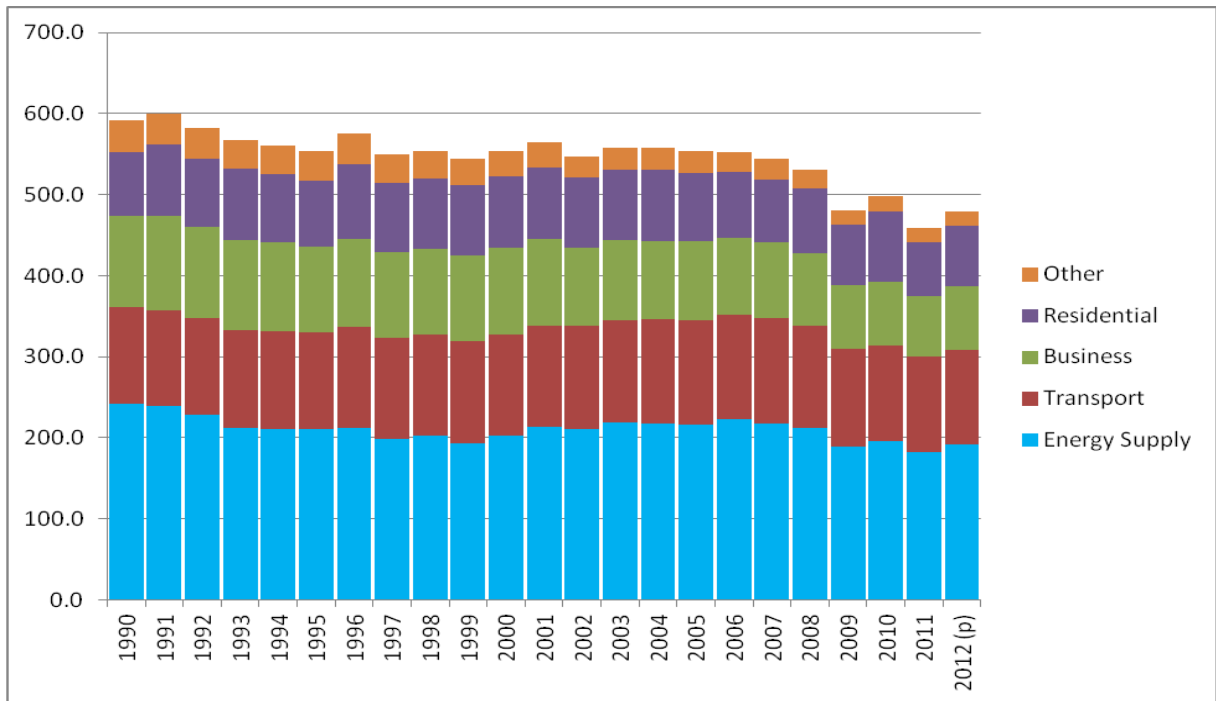
**Table 2: Sources of carbon dioxide emissions, 1990-2012 (provisional) (Mt)**

	1990	1995	2000	2005	2008	2009	2010	2011	2012 (p)
Energy Supply	241	210	203	216	213	190	195	182	192
Transport	120	120	125	129	125	121	119	117	116
Business	113	107	107	97	90	79	79	76	79
Residential	79	81	87	84	80	75	87	66	74
Other	39	36	31	27	23	17	18	17	18
Total	592	554	553	554	531	481	498	459	479

(p) 2012 estimates are provisional.

All figures are for the UK and Crown Dependencies only, and exclude Overseas Territories.

**Figure 2: Carbon dioxide emissions by source, 1990-2012 (provisional), (Mt)**



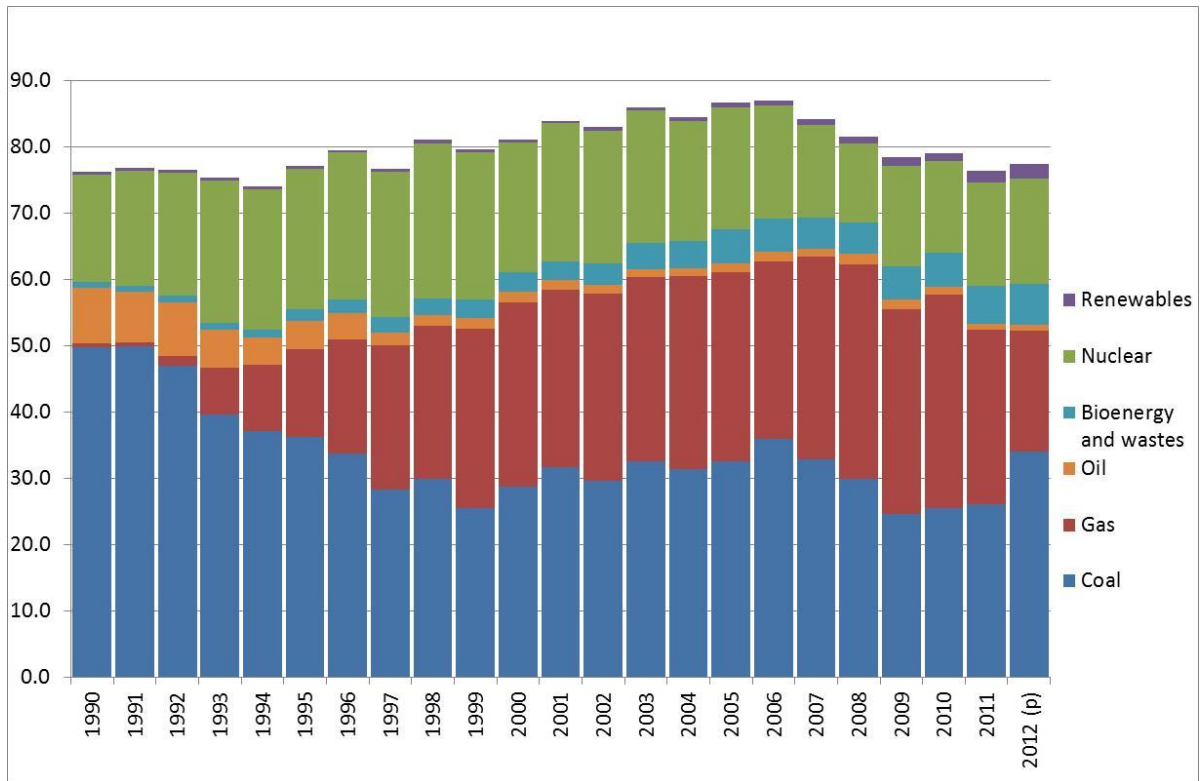
### *Energy supply*

The energy supply sector was the largest contributor to the increase in CO<sub>2</sub> emissions between 2011 and 2012. Emissions from this sector were provisionally estimated to be 192.1 Mt in 2012, an increase of around 5 per cent compared to 2011.

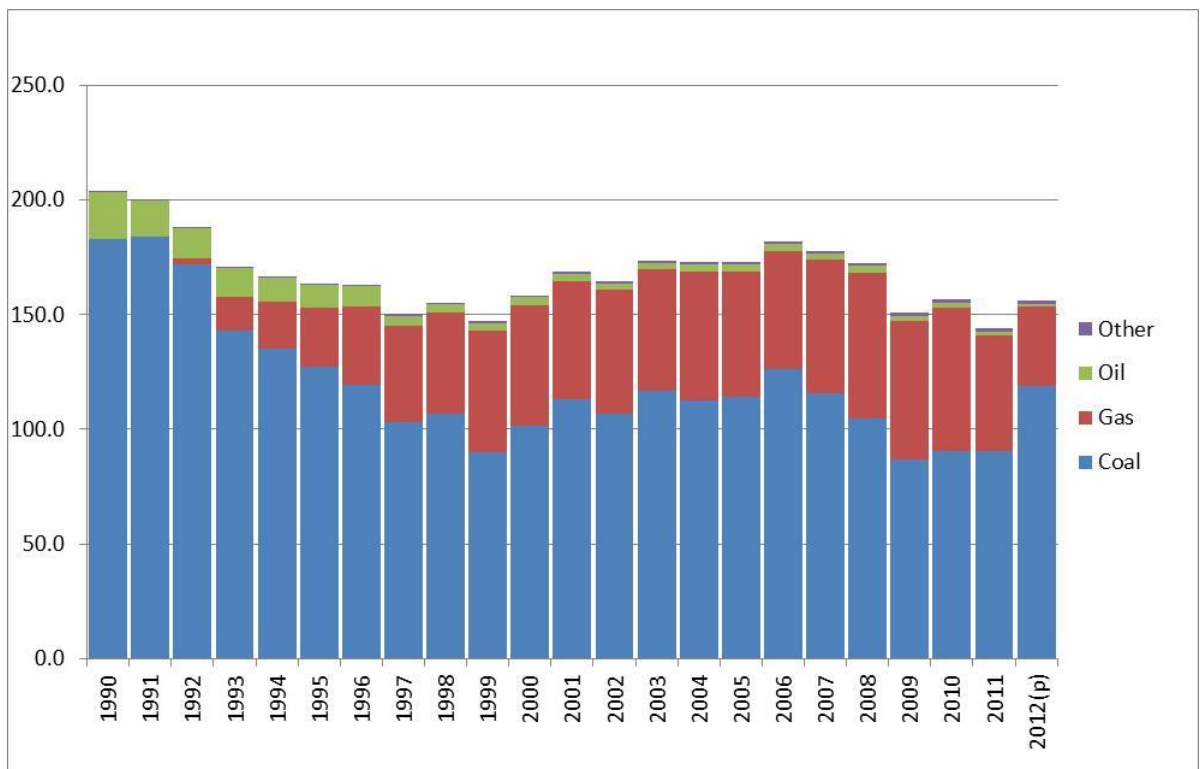
The increase in emissions from this sector since 2010 can almost entirely be attributed to power stations. Although demand for electricity was broadly unchanged, there was a substantial change in the fuel mix used at power stations for electricity generation, with significantly less gas and significantly more coal being used. There was a 31 per cent decrease in gas use for generation, alongside a 31 per cent increase in the use of coal. Together, these changes resulted in an increase of around 8 per cent in emissions from electricity generation. In 2012, CO<sub>2</sub> emissions from power stations, at 156.1 Mt, accounted for just under a third of all CO<sub>2</sub> emissions.

Figure 3 and figure 4 below shows the impact on emissions of the change in the fuel mix for electricity generation between 1990 and 2012.

**Figure 3: Fuel mix for UK electricity generation, 1990-2012 (provisional), (MtOe)**



**Figure 4: Carbon dioxide emissions from electricity generation, 1990-2012 (provisional), (Mt)**

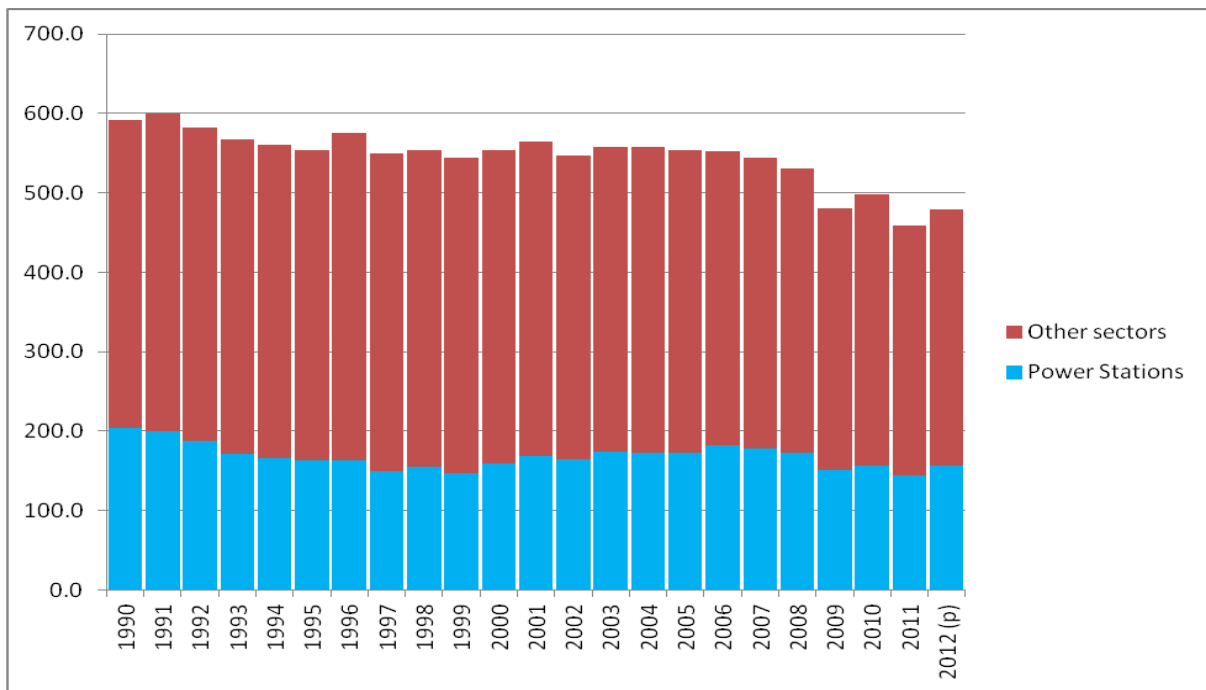


Emissions from the energy supply sector were estimated to be around 20 per cent lower in 2012 than they were in 1990. Between 1990 and 2012, final consumption of electricity increased by around 16 per cent; domestic electricity consumption in particular was around 21 per cent higher in 2012 than in 1990.

However, emissions from electricity generation have decreased by 23 per cent over the same period. Between 1990 and 2010, there was an upward trend in gas usage for electricity generation. However the sharp decreases observed in 2011 and 2012 now put gas usage at power stations around 44 per cent below the 2008 peak level. Conversely, there was a 31 per cent increase in coal use at power stations between 2011 and 2012, although coal use in 2012 was still around 55 per cent lower than 1990 levels.

Figure 5 below shows the actual level of CO<sub>2</sub> emissions from electricity generation at power stations, in relation to total CO<sub>2</sub> emissions. The decrease in emissions from power stations since 1990 has resulted from a combination of changes in the fuel mix over the period together with greater efficiency due to improvements in technology. It is difficult to assess the relative impacts of the two, but it is likely that the majority of the saving since 1990 will have been due to fuel switching from coal to gas for electricity generation.

**Figure 5: Carbon dioxide emissions from electricity generated at power stations, 1990-2012 (provisional), (Mt)**



### Transport

In 2012, CO<sub>2</sub> emissions from the transport sector, at 116 Mt, accounted for just under a quarter of all CO<sub>2</sub> emissions. Between 2011 and 2012, transport emissions decreased by 1.2 per cent (1.4 Mt), with lower petrol consumption outweighing an increase in diesel consumption.

Emissions from this sector are down slightly from 1990 levels (down 3 per cent, or 3 Mt). There has been a general increase in these emissions throughout the period up to 2007, but they are now at their lowest since 1988.

It should be noted that these estimates do not include emissions from international aviation and shipping; domestic aviation and shipping, however, are included.

### *Residential*

In 2012, the residential sector, with emissions of 74 Mt, accounted for around 15 per cent of all CO<sub>2</sub> emissions. Between 2011 and 2012 there was a 12 per cent increase in emissions from this sector, the highest increase for any single sector in percentage terms, resulting from an increase in the use of all fossil fuels, gas in particular.

Residential emissions are heavily influenced by external temperatures, and 2012 was cooler than 2011. In particular, the last quarter in 2012 was cooler than the equivalent quarter of 2011 by 2.3 degrees Celsius. This heavily contributed to the significant (15 per cent) increase in the use of natural gas for space heating, which was therefore reflected by a similar increase in emissions.

In 2012, emissions from this sector were estimated to be around 6 per cent lower than in 1990. Since 1990, emissions have only been at a lower level on one occasion, in 2011.

It should be noted that emissions from this sector do not include emissions from power stations related to domestic electricity consumption.

### *Business*

Carbon dioxide emissions from the business sector, at 79 Mt, accounted for around 17 per cent of all CO<sub>2</sub> emissions in 2012. This was 5 per cent (4 Mt) higher than in 2011. Emissions from this sector were provisionally estimated to be 30 per cent below 1990 levels in 2012.

### *Industrial process*

In 2012, CO<sub>2</sub> emissions from the industrial process sector were estimated to be 10 Mt, an increase of around 3 per cent compared with 2011. Between 1990 and 2012, emissions from this sector are provisionally estimated to have decreased by around 41 per cent.

### *Public sector*

Carbon dioxide emissions from the public sector, at 7 Mt, were up by around 4 per cent from 2011. It has been provisionally estimated that there has been an overall reduction of 43 per cent in emissions from this sector between 1990 and 2012.

### *Agriculture, waste management and land use, land use change and forestry*

Emissions estimates for these sectors are not yet available for 2012, so the 2011 estimate has been used for this component of total UK CO<sub>2</sub> emissions in 2012.

On this basis, 2012 emissions from the agriculture sector, at 4 Mt, are estimated to have been 20 per cent (1 Mt) lower than in 1990. Carbon dioxide emissions from waste management were estimated to be 0.3 Mt in 2012, down from 1.3 Mt in 1990. Net land use, land use change and forestry emissions have changed from emissions of 3 Mt in 1990 to removals of 4 Mt in 2012.



## Carbon dioxide emissions by fuel type

The amount of carbon dioxide released by the consumption of one unit of energy depends on the type of fuel consumed. For example, since coal has a higher carbon content than gas, more CO<sub>2</sub> emissions result from burning one unit of coal than from one unit of gas.

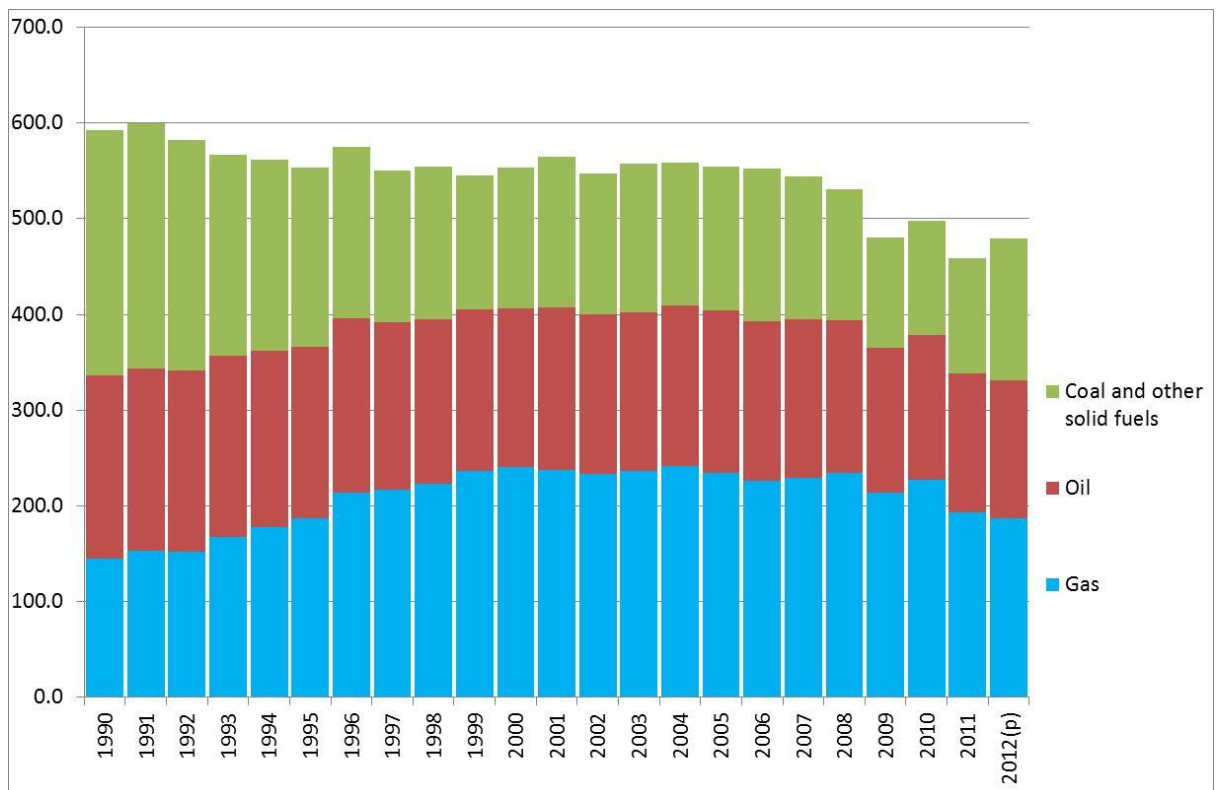
Emissions per unit of electricity supplied by major power producers from fossil fuels are estimated to have been 660 tonnes of carbon dioxide per GWh in 2012 overall; within this, emissions from electricity generated from coal (886 tonnes of carbon dioxide per GWh electricity supplied) were over two times higher than for electricity supplied by gas (355 tonnes of carbon dioxide per GWh). For all sources of electricity (including nuclear, renewables and autogeneration), the average amount of carbon dioxide emitted in 2012 amounted to 457 tonnes per GWh of electricity supplied, compared to 415 tonnes per GWh in 2011.

In 2011, carbon dioxide emissions from the use of fossil fuels, including fuel used for generating electricity, were estimated at 468 Mt. This was 5 per cent higher than the 2011 figure of 447 Mt. The biggest change in emissions was from the use of coal, up 28 per cent (28 Mt) from 101 Mt in 2011 to 129 Mt in 2012. This largely resulted from increased use of coal for electricity generation at power stations.

Over the period 1990 to 2012, CO<sub>2</sub> emissions from fossil fuels decreased by 18 per cent. Over the same period, overall primary consumption of fossil fuels was broadly unchanged. The relatively higher decrease in emissions has been due to an increase in the use of gas accompanied by a decrease in the use of coal and other solid fuels; gas consumption as a proportion of all fossil fuels has increased from 26 per cent in 1990 to 40 per cent in 2012, whilst the proportion used of coal and other solid fuels has decreased from 34 per cent to 23 per cent over the same period. Oil use, as a proportion of all fossil fuels, has remained relatively stable over the period; this accounted for almost 40 per cent of all fossil fuels used in 1990 and 37 per cent in 2012.

Figure 6 below shows CO<sub>2</sub> emissions by fossil fuel between 1990 and 2012. The time series for selected years since 1990 is shown in Table 18 towards the end of this statistical release.

**Figure 6: Carbon dioxide emissions by fossil fuels: 1990-2012 (provisional), (Mt)**



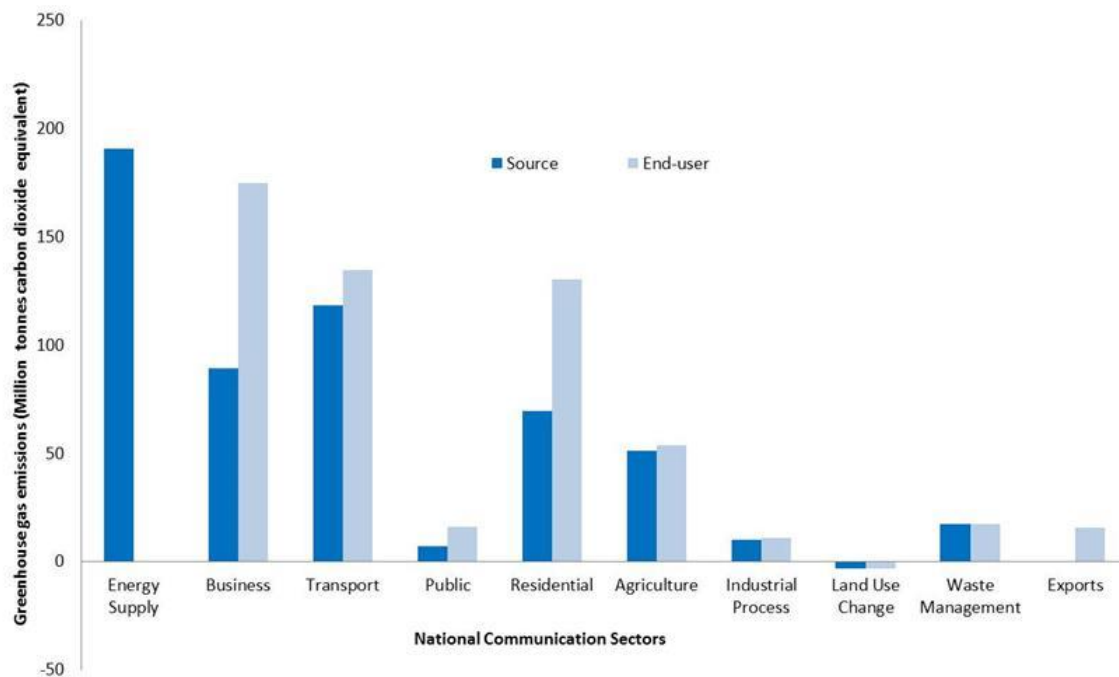
## 2011 greenhouse gas emissions by end-user sector

Also published today is the breakdown of 2011 greenhouse gas emissions by end-user sector. These results are based on, and consistent with, the breakdown of 2011 emissions by source which was published on 5<sup>th</sup> February 2013.

The end-user breakdown reallocates emissions by source in accordance with where the “end-use” occurred. The primary effect this has is to reallocate emissions which have the energy supply sector as their source to other sectors, the business and residential sectors in particular. Amongst other things, this therefore reallocates emissions occurring at power stations in generating electricity to the place where the electricity is actually consumed. It should be noted that the results shown by this breakdown are based on a number of assumptions, and we would therefore expect them to be subject to a wider margin of error than the breakdown of emissions by source.

The affect across all sectors of reallocating 2011 greenhouse gas emissions from source to end-user is shown in Figure 7 below.

**Figure 7: Allocation of 2011 greenhouse gas emissions from source sectors to end-user sectors (MtCO<sub>2</sub>e)**



Greenhouse gas emissions are reported here in two ways: by gas, and by the end-user sector of the emissions. Looking at the breakdown by end-user sector, in 2011 32 per cent of greenhouse gas emissions were from the business sector, 24 per cent from transport, 24 per cent from the residential sector and 10 per cent from agriculture. The other 10 per cent were attributable to the remaining sectors; waste management, industrial process, the public sector, exports and LULUCF.

Figure 8 below shows the breakdown of 2011 UK greenhouse emissions by end-user sector. Note that this does not include emissions from the LULUCF

sector, since in 2011 this sector acted as a net sink, and emissions were therefore effectively negative.

**Figure 8: Greenhouse gas emissions by end-user sector, 2011 (excluding LULUCF)**

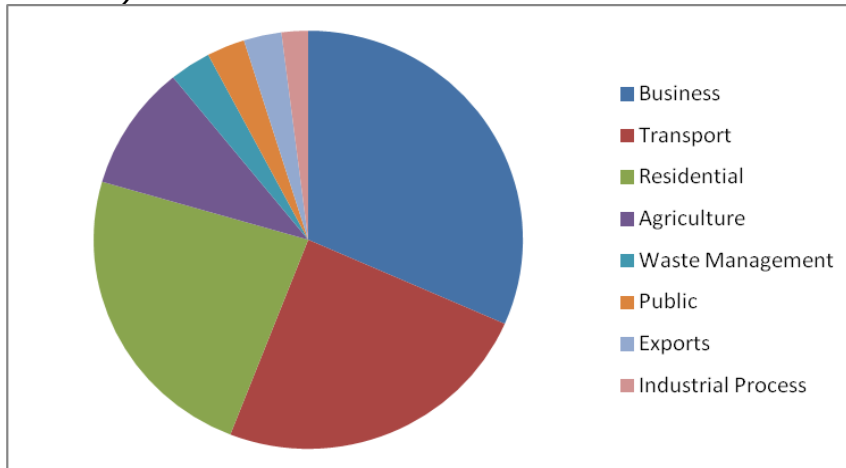


Table 3 below shows the two-way breakdown of 2011 emissions by gas and end-user sector, in absolute terms. Table 4 then shows how these figures translate into percentages of the UK's total emissions. Note that emissions from the LULUCF sector have been excluded from Table 4, since in 2011 these were effectively negative.

**Table 3: Breakdown of 2011 UK greenhouse gas emissions by gas and end-user sector (MtCO<sub>2</sub>e)**

	Carbon dioxide	Methane	Nitrous oxide	Fluorinated gases	Total
Business	157.9	3.2	1.5	12.4	175.0
Transport	133.1	0.6	1.2	0.0	134.8
Residential	124.1	3.2	0.5	2.7	130.5
Agriculture	6.5	17.9	29.2	0.0	53.6
Waste Management	0.3	15.8	1.3	0.0	17.3
Public	15.5	0.4	0.1	0.0	15.9
Exports	15.1	0.5	0.2	0.0	15.8
Industrial Process	10.1	0.3	0.2	0.4	11.1
LULUCF	-3.9	0.0	0.6	0.0	-3.3
<b>Total</b>	<b>458.6</b>	<b>41.9</b>	<b>34.7</b>	<b>15.5</b>	<b>550.7</b>

All figures are for the UK and Crown Dependencies only, and exclude Overseas Territories.

**Table 4: Breakdown of 2011 UK greenhouse gas emissions by gas and end-user sector (% of total UK emissions, excluding LULUCF)**

	Carbon dioxide	Methane	Nitrous oxide	Fluorinated gases	Total
Business	28.5%	0.6%	0.3%	2.2%	31.6%
Transport	24.0%	0.1%	0.2%	0.0%	24.3%
Residential	22.4%	0.6%	0.1%	0.5%	23.6%
Agriculture	1.2%	3.2%	5.3%	0.0%	9.7%
Waste Management	0.0%	2.8%	0.2%	0.0%	3.1%
Public	2.8%	0.1%	0.0%	0.0%	2.9%
Exports	2.7%	0.1%	0.0%	0.0%	2.8%
Industrial Process	1.8%	0.1%	0.0%	0.1%	2.0%
<b>Total</b>	<b>83.5%</b>	<b>7.6%</b>	<b>6.2%</b>	<b>2.8%</b>	<b>100.0%</b>

All figures are for the UK and Crown Dependencies only, and exclude Overseas Territories.

A summary of the changes in the end-user breakdown for each gas between 2010 and 2011 can be found in Table 19 towards the end of this statistical release. This also shows a comparable summary of the breakdown of emissions by source, which was published in February 2013.

The full end-user breakdown by National Communications category, from 1990 to 2011, can be found on the [UK Greenhouse Gas Emissions Statistics section of the Gov.uk website](#).

## Emissions by end-user sector

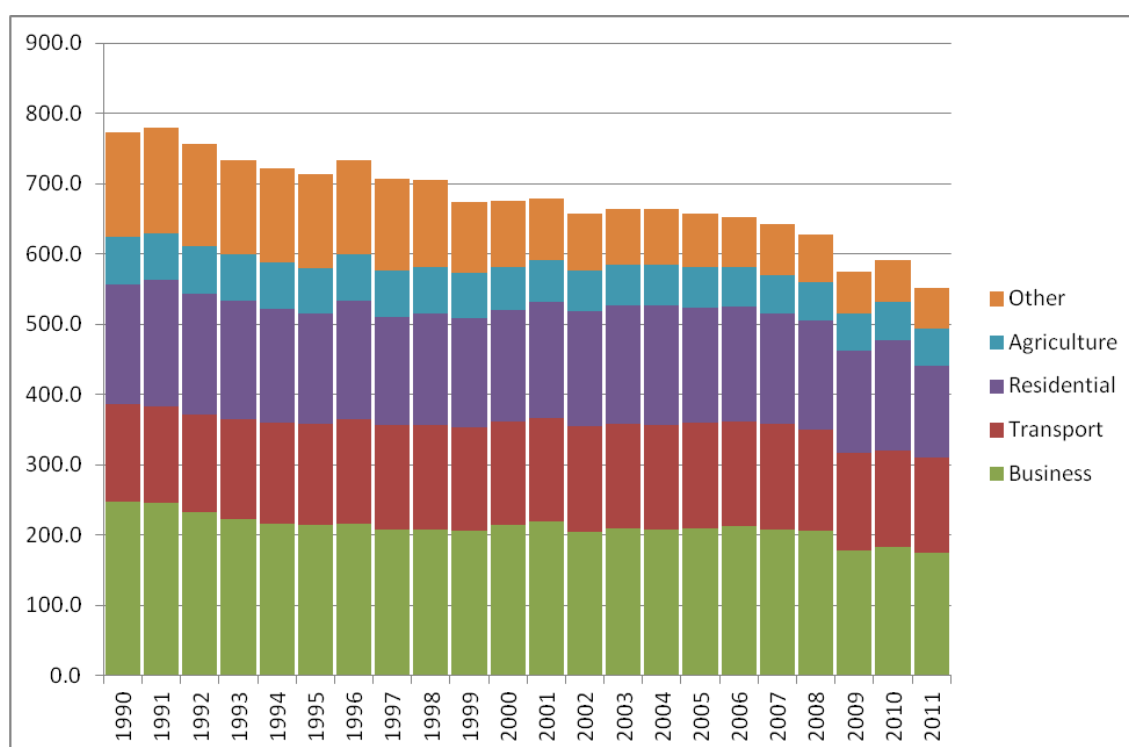
Table 5 and Figure 9 below show the breakdown of greenhouse gas emissions into the main source sectors for selected years between 1990 and 2011.

**Table 5: Greenhouse gas emissions by end-user sector, 1990-2011 (MtCO<sub>2</sub>e)**

	1990	1995	2000	2005	2009	2010	2011
Business	247.7	215.0	214.2	210.1	178.2	183.0	175.0
Transport	139.3	143.0	146.5	148.9	138.6	136.8	134.8
Residential	169.7	156.5	158.9	164.0	144.7	157.8	130.5
Agriculture	67.6	65.7	61.9	58.2	53.1	53.7	53.6
Waste Management	47.4	41.4	30.8	20.4	18.5	17.9	17.3
Public	30.8	28.2	23.6	22.2	17.9	17.9	15.9
Exports	9.2	13.3	13.1	16.2	15.4	15.9	15.8
Industrial Process	57.3	47.4	26.6	19.5	11.8	12.6	11.1
LULUCF	4.0	3.3	0.4	-2.6	-3.8	-3.7	-3.3
<b>Total</b>	<b>772.9</b>	<b>713.8</b>	<b>675.9</b>	<b>657.0</b>	<b>574.3</b>	<b>591.7</b>	<b>550.7</b>

All figures are for the UK and Crown Dependencies only, and exclude Overseas Territories.

**Figure 9: Greenhouse gas emissions by end-user sector, 1990-2011 (MtCO<sub>2</sub>e)**



Details of changes over time for each sector are set out in the following sections of this statistical release. In each case, information about the trend between 1990 and 2010 provides some context, followed by details of the changes since 2010 now seen in the 2011 estimates.

## **Business**

The business sector was responsible for 32 per cent of UK greenhouse gas emissions in 2011, with carbon dioxide being the most prominent gas. Emissions from this sector primarily relate to fossil fuel combustion in industry and commerce, although emissions of F-gases from the use of fluorinated compounds in certain applications, particularly refrigeration and air-conditioning, are not insignificant.

### Context – 1990 to 2010

Between 1990 and 2010, there was an overall downward trend in greenhouse gas emissions from the business sector, resulting in a decrease of around 26 per cent. This has been largely due to a reduction in emissions from industrial combustion (including iron and steel) over the period. Although emissions of carbon dioxide have reduced over the period (by 28 per cent), emissions from F-gases have increased significantly. This has mainly been due to an increase in emissions from refrigeration and air-conditioning; between 1993 and 2002, hydrofluorcarbons (HFCs) were used to replace other, ozone depleting, substances which were previously used as refrigerants. This increasing trend has since slowed, as tighter controls on emissions leakages have been introduced.

### 2011 results

Between 2010 and 2011 emissions from business fell by 4.4 per cent (8.0 MtCO<sub>2</sub>e). This decrease was mainly driven by a fall in carbon dioxide emissions across industry and commerce as a whole.

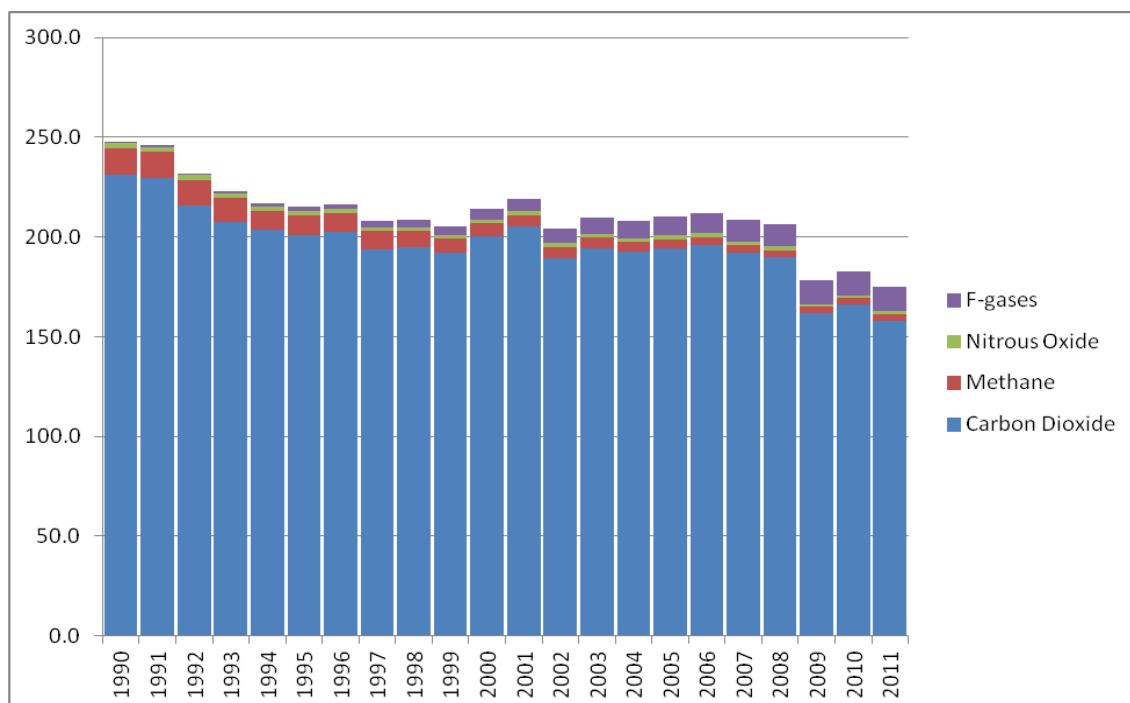
The breakdown of emissions by gas for selected years since 1990 is shown in Table 6 below. The trend in emissions over the period is shown in Figure 10.

**Table 6: Business sector emissions by gas, 1990-2011 (MtCO<sub>2</sub>e)**

	1990	1995	2000	2005	2008	2009	2010	2011
Carbon dioxide	231.1	200.9	200.5	194.5	189.7	161.6	166.1	157.9
Methane	13.3	10.0	6.4	4.2	3.6	3.3	3.2	3.2
Nitrous oxide	2.6	2.2	1.9	2.0	1.8	1.5	1.6	1.5
F-gases	0.7	1.9	5.3	9.5	11.3	11.7	12.1	12.4
Total	247.7	215.0	214.2	210.1	206.4	178.2	183.0	175.0

All figures are for the UK and Crown Dependencies only, and exclude Overseas Territories.

**Figure 10: Greenhouse gas emissions from business, 1990-2011 (MtCO<sub>2</sub>e)**



## **Transport**

The transport sector was responsible for around 24 per cent of UK greenhouse gas emissions in 2011, with carbon dioxide being by far the most prominent gas. Emissions of CO<sub>2</sub> are closely related to the amount of fuel used, whilst nitrous oxide and methane emissions are influenced more by the vehicle type and age.

### Context – 1990 to 2010

Between 1990 and 2010, there was very little overall change in the level of greenhouse gas emissions from the transport sector (emissions were around 2 per cent lower in 2010 than in 1990), although emissions did in fact increase up to 2007 and then fall again from 2008 onwards. Between 2007 and 2010 there was a 9 per cent decrease in emissions.

Road transport is the most significant source of emissions in this sector, passenger cars in particular, and the changes which have been seen over the period were heavily influenced by this category. Whilst there has been a decrease in emissions from passenger cars over the period, this was partially offset by an increase in emissions from light duty vehicles. Although there has been an increase in both the number of passenger vehicles and the vehicle kilometres travelled, the decrease in emissions from passenger cars has been due to lower petrol consumption outweighing an increase in diesel consumption.

### 2011 results

Between 2010 and 2011 emissions from transport fell by 1.4 per cent (2.0 MtCO<sub>2</sub>e). This decrease was primarily due, again, to a decrease in petrol consumption alongside a relatively smaller increase in diesel consumption.



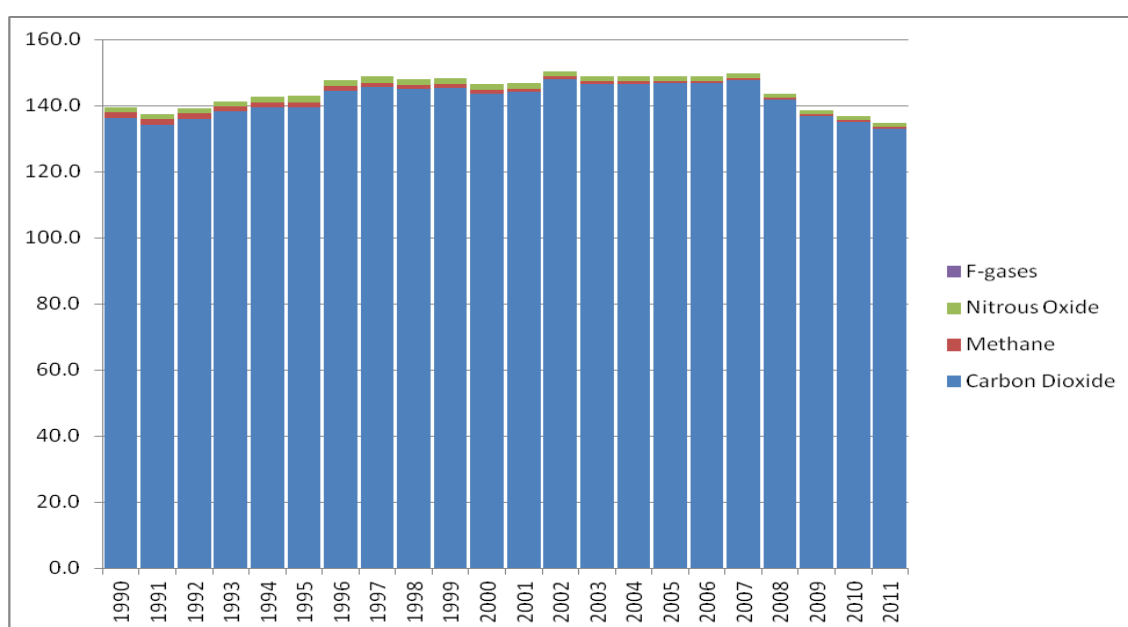
The breakdown of emissions by gas for selected years since 1990 is shown in Table 7 below. The trend in emissions over the period is shown in Figure 11.

**Table 7: Transport sector emissions by gas, 1990-2011 (MtCO<sub>2</sub>e)**

	1990	1995	2000	2005	2008	2009	2010	2011
Carbon dioxide	136.1	139.5	143.7	146.8	141.8	136.9	135.1	133.1
Methane	1.7	1.5	1.0	0.7	0.6	0.6	0.5	0.6
Nitrous oxide	1.5	2.0	1.8	1.4	1.2	1.1	1.1	1.2
F-gases	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total</b>	<b>139.3</b>	<b>143.0</b>	<b>146.5</b>	<b>148.9</b>	<b>143.5</b>	<b>138.6</b>	<b>136.8</b>	<b>134.8</b>

All figures are for the UK and Crown Dependencies only, and exclude Overseas Territories.

**Figure 11: Greenhouse gas emissions from transport, 1990-2011(MtCO<sub>2</sub>e)**



## **Residential**

The residential sector was responsible for around 24 per cent of UK greenhouse gas emissions in 2011, with carbon dioxide being the most prominent gas for this sector.

It should be noted that, unlike emissions by source, which only cover activities related to residential fossil fuel use, emissions reported by end-user do also include residential electricity use which have been re-allocated from the energy supply sector.

### Context – 1990 to 2010

Between 1990 and 2010, there was considerable variation in greenhouse gas emissions from year to year in the residential sector. However, since 2004 there has been a general downward trend, although 2010 was an exception to this due to the particularly cold weather experienced in that year. Emissions of F-gases in this sector, which have increased slightly since 1990, are related to the use of aerosols and metered dose inhalers.

## 2011 results

Between 2010 and 2011 there was a decrease of around 17 per cent (27.2 MtCO<sub>2</sub>e) in emissions from this sector, the highest decrease for any single sector in both absolute and percentage terms. In general, carbon dioxide emissions from this sector in particular are heavily influenced by external temperatures. Compared with the long term average, 2011 was a warm year; in particular, it was significantly warmer than 2010. In the first and last quarters, 2011 was warmer than 2010 by 2.2 and 4.1 degrees Celsius respectively. This heavily contributed to a significant reduction in the use of both natural gas and electricity for space heating, which was reflected by a similar fall in emissions.

Emissions from this sector are now at their lowest level since 1990, and are 27 per cent below the 1991 peak.

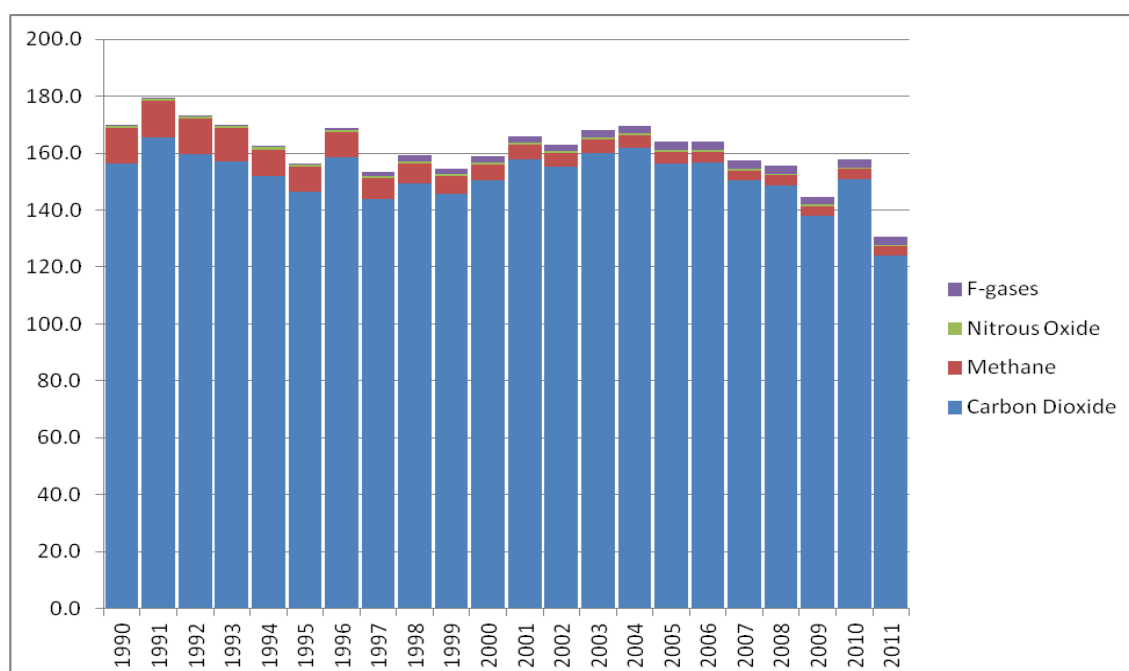
The breakdown of emissions by gas for selected years since 1990 is shown in Table 8 below. The trend in emissions over the period is shown in Figure 12.

**Table 8: Residential sector emissions by gas, 1990-2011 (MtCO<sub>2</sub>e)**

	1990	1995	2000	2005	2008	2009	2010	2011
Carbon dioxide	156.5	146.5	150.5	156.4	148.8	138.0	150.9	124.1
Methane	12.2	8.8	5.5	4.0	3.5	3.5	3.6	3.2
Nitrous oxide	1.0	0.7	0.6	0.6	0.6	0.5	0.6	0.5
F-gases	0.0	0.4	2.2	3.0	2.9	2.8	2.7	2.7
Total	169.7	156.5	158.9	164.0	155.7	144.7	157.8	130.5

All figures are for the UK and Crown Dependencies only, and exclude Overseas Territories.

**Figure 12: Greenhouse gas emissions from the residential sector, 1990-2011 (MtCO<sub>2</sub>e)**



## **Agriculture**

The agriculture sector was responsible for 10 per cent of UK greenhouse gas emissions in 2011. Emissions of methane and nitrous oxide dominate this sector. The most significant sources here are emissions of methane due to enteric fermentation from livestock, particularly cattle, and nitrous oxide emissions related to the use of fertilisers on agricultural soils.

### Context – 1990 to 2010

Between 1990 and 2010, there was a general downward trend in greenhouse gas emissions from this sector, resulting in an overall decrease of around 20 per cent. This reduction has been driven by a fall in animal numbers over the period, together with a decrease in synthetic fertiliser use.

### 2011 results

Between 2010 and 2011 there was virtually no change in emissions from the agriculture sector.

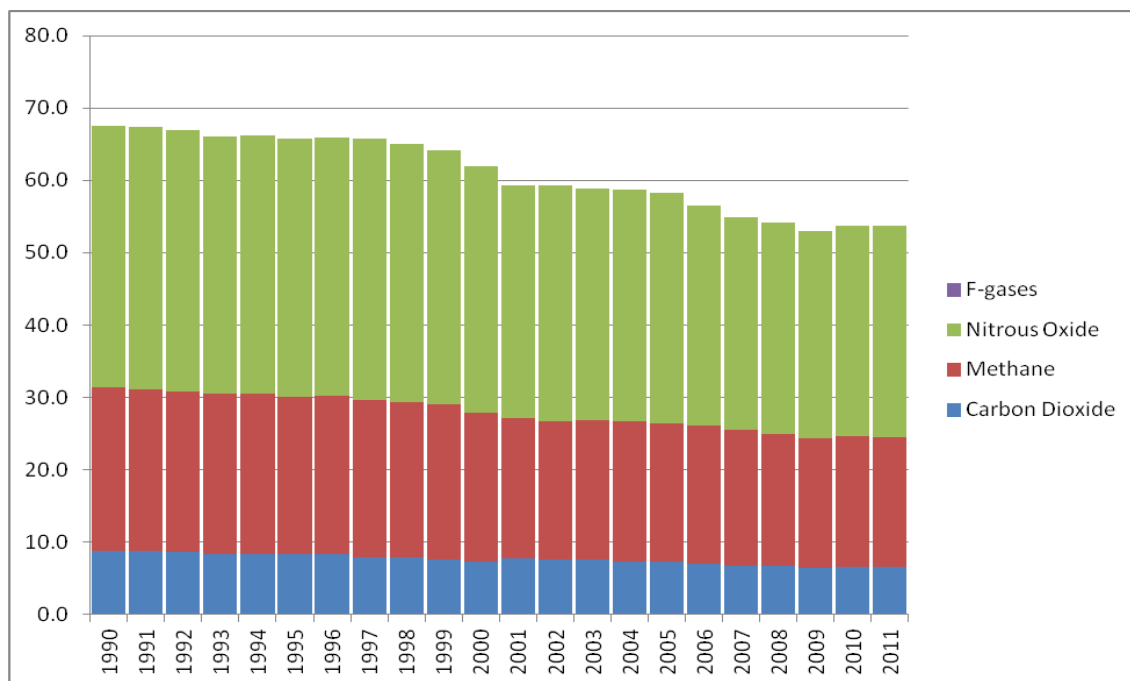
The breakdown of emissions by gas for selected years since 1990 is shown in Table 9 below. The trend in emissions over the period shown in Figure 13.

**Table 9: Agriculture sector emissions by gas, 1990-2011 (MtCO<sub>2</sub>e)**

	1990	1995	2000	2005	2008	2009	2010	2011
Carbon dioxide	8.7	8.3	7.3	7.2	6.7	6.4	6.6	6.5
Methane	22.7	21.8	20.6	19.1	18.3	17.9	18.0	17.9
Nitrous oxide	36.1	35.7	34.0	31.9	29.1	28.7	29.1	29.2
F-gases	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	67.6	65.7	61.9	58.2	54.1	53.1	53.7	53.6

All figures are for the UK and Crown Dependencies only, and exclude Overseas Territories.

**Figure 13: Greenhouse gas emissions from agriculture, 1990-2011 (MtCO<sub>2</sub>e)**



### **Waste management**

For the waste management sector, emissions measured by end-user are the same as those measured by source, since no emissions from the energy supply sector are reallocated to waste management.

This sector was responsible for around 3 per cent of UK greenhouse gas emissions in 2011, with methane being by far the most prominent gas. The vast majority of these emissions are from landfill sites.

#### Context – 1990 to 2010

Between 1990 and 2010, there was a significant reduction in greenhouse gas emissions from the waste management sector, resulting in an overall decrease of around 62 per cent. This has been due to a combination of factors, including improvements in the standards of landfilling, changes to the types of waste going to landfill (such as reducing the amount of biodegradable waste), and an increase in the amount of landfill gas being used for energy. Emissions of methane alone have reduced by 64 per cent over the period.

#### 2011 results

Between 2010 and 2011 emissions from waste management fell by just over 3 per cent (0.6 MtCO<sub>2</sub>e), reflecting a continuation of the same trend seen in recent years, due to the same reasons.

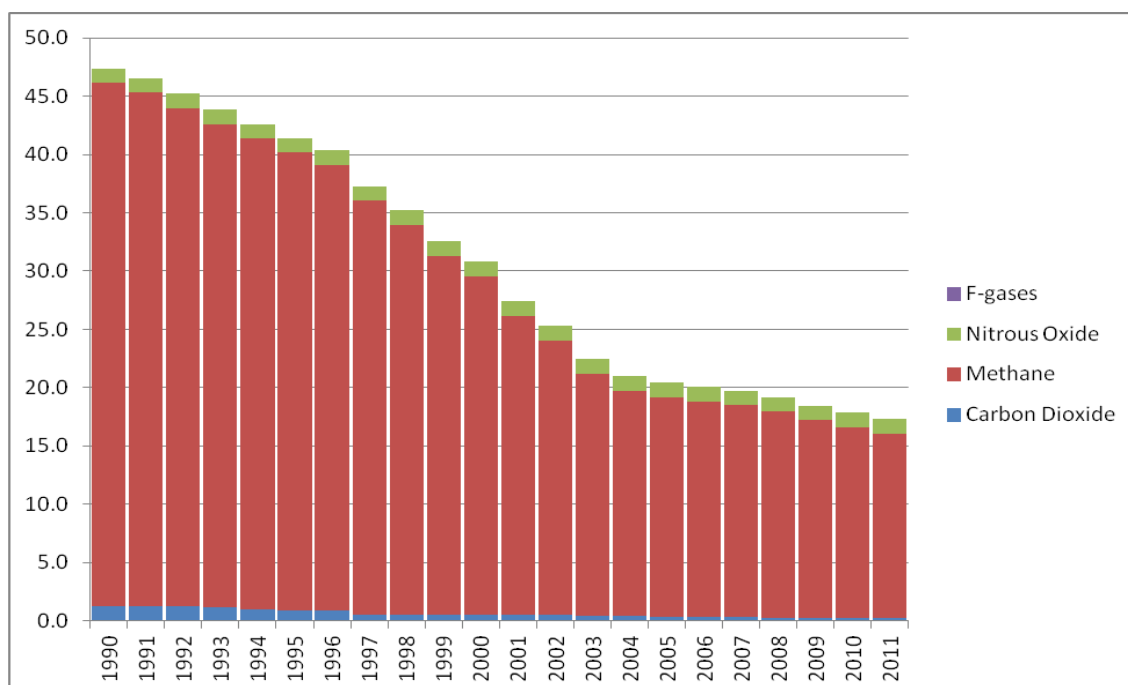
The breakdown of emissions by gas for selected years since 1990 is shown in Table 10 below. The trend over the period is shown in Figure 14.

**Table 10: Waste management sector emissions by gas, 1990-2011 (MtCO<sub>2</sub>e)**

	1990	1995	2000	2005	2008	2009	2010	2011
Carbon dioxide	1.3	0.9	0.5	0.4	0.3	0.3	0.3	0.3
Methane	44.9	39.3	29.0	18.8	17.7	17.0	16.3	15.8
Nitrous oxide	1.2	1.2	1.3	1.2	1.2	1.2	1.3	1.3
F-gases	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total</b>	<b>47.4</b>	<b>41.4</b>	<b>30.8</b>	<b>20.4</b>	<b>19.2</b>	<b>18.5</b>	<b>17.9</b>	<b>17.3</b>

All figures are for the UK and Crown Dependencies only, and exclude Overseas Territories.

**Figure 14: Greenhouse gas emissions from waste management, 1990-2011 (MtCO<sub>2</sub>e)**



### **Public sector**

The public sector was responsible for around 3 per cent of UK greenhouse gas emissions in 2011, with carbon dioxide representing almost the entirety of these emissions.

#### Context – 1990 to 2010

Between 1990 and 2010, there was a general downward trend in greenhouse gas emissions from the public sector, with an overall decrease of around 42 per cent. This has been largely driven by a reduction in the use of oil in this sector.

#### 2011 results

Between 2010 and 2011 emissions from the public sector fell by just under 11 per cent (1.9 MtCO<sub>2</sub>e), largely due to a reduction in natural gas use.

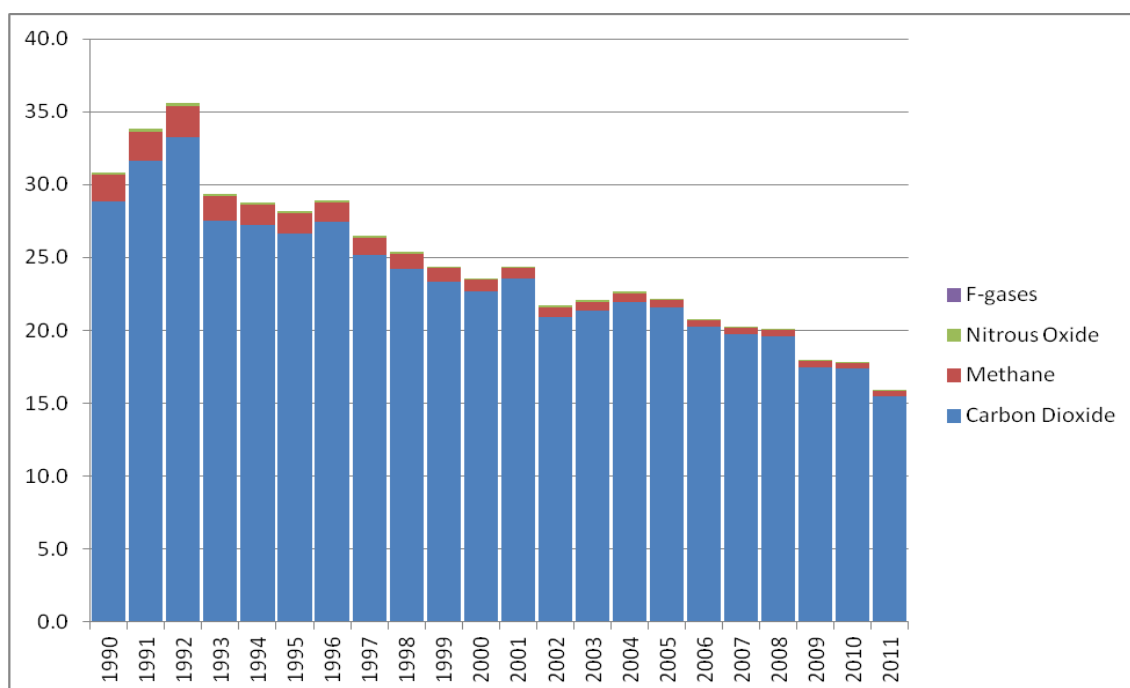
The breakdown of emissions by gas for selected years since 1990 is shown in Table 11 below. The trend over the period is shown in Figure 15.

**Table 11: Public sector emissions by gas, 1990-2011 (MtCO<sub>2</sub>e)**

	1990	1995	2000	2005	2008	2009	2010	2011
Carbon dioxide	28.9	26.7	22.7	21.6	19.6	17.4	17.4	15.5
Methane	1.8	1.4	0.8	0.5	0.4	0.4	0.4	0.4
Nitrous oxide	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
F-gases	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total</b>	<b>30.8</b>	<b>28.2</b>	<b>23.6</b>	<b>22.2</b>	<b>20.1</b>	<b>17.9</b>	<b>17.9</b>	<b>15.9</b>

All figures are for the UK and Crown Dependencies only, and exclude Overseas Territories.

**Figure 15: Greenhouse gas emissions from the public sector, 1990-2011 (MtCO<sub>2</sub>e)**



## Exports

The exports sector represents emissions associated with the production of fuels within the UK (for example, from a refinery or a coal mine) which are subsequently exported or sent to bunkers for use outside the UK. Since these fuels are ultimately used for activities which occur outside the UK, it would not be appropriate to allocate the emissions from their production to any of the National Communication sectors, so they are reported under a separate, additional sector.

The exports sector was responsible for just under 3 per cent of UK greenhouse gas emissions in 2011, with carbon dioxide representing almost the entirety of these emissions.

### Context – 1990 to 2010

Between 1990 and 2010, there was a general upward trend in greenhouse gas emissions from the exports sector, with an overall increase of around 72 per cent. This has largely been driven by changes in throughput at refineries, which

have fed through to increased exports rather than increased deliveries to the domestic market.

2011 results

Between 2010 and 2011 emissions from the exports sector remained at around the same level.

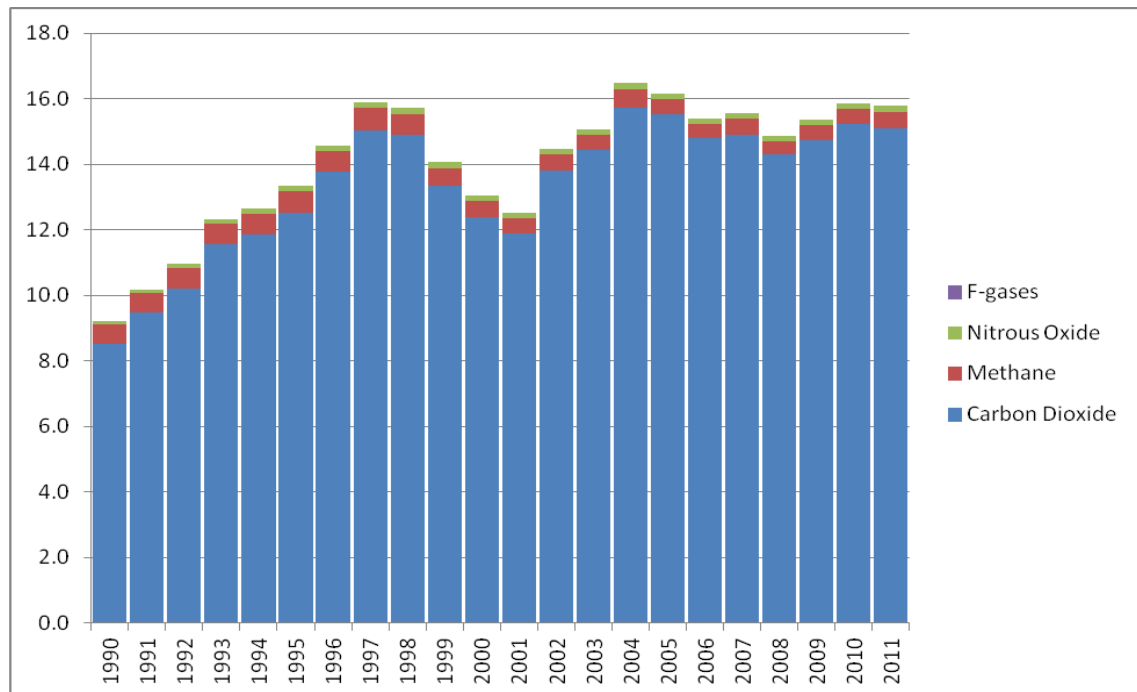
The breakdown of emissions by gas for selected years since 1990 is shown in Table 12 below. The trend over the period is shown in Figure 16.

**Table 12: Exports sector emissions by gas, 1990-2011 (MtCO<sub>2</sub>e)**

	1990	1995	2000	2005	2008	2009	2010	2011
Carbon dioxide	8.5	12.5	12.4	15.5	14.3	14.7	15.2	15.1
Methane	0.6	0.7	0.5	0.4	0.4	0.5	0.4	0.5
Nitrous oxide	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
F-gases	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total</b>	<b>9.2</b>	<b>13.3</b>	<b>13.1</b>	<b>16.2</b>	<b>14.9</b>	<b>15.4</b>	<b>15.9</b>	<b>15.8</b>

All figures are for the UK and Crown Dependencies only, and exclude Overseas Territories.

**Figure 16: Greenhouse gas emissions from the exports sector, 1990-2011 (MtCO<sub>2</sub>e)**



**Industrial process**

The industrial process sector was responsible for 2 per cent of UK greenhouse gas emissions in 2011, with carbon dioxide being the most prominent gas. The main source of emissions is cement production, with other processes such as sinter and lime production also worth mentioning.

## Context – 1990 to 2010

Between 1990 and 2010, there was a significant reduction in greenhouse gas emissions from the industrial process sector, with an overall decrease of around 78 per cent. This was most notably due to a large reduction in emissions from adipic acid production and halocarbon production between 1998 and 1999 (combined emissions of which are now almost zero), although there has been a general downward trend in emissions over the period.

## 2011 results

Between 2010 and 2011 emissions from the industrial process sector fell by around 12 per cent (1.5 MtCO<sub>2</sub>e). This was largely driven by a reduction in nitrous oxide emissions from nitric acid production, with abatement technology being installed at all three UK nitric acid production plants during the year.

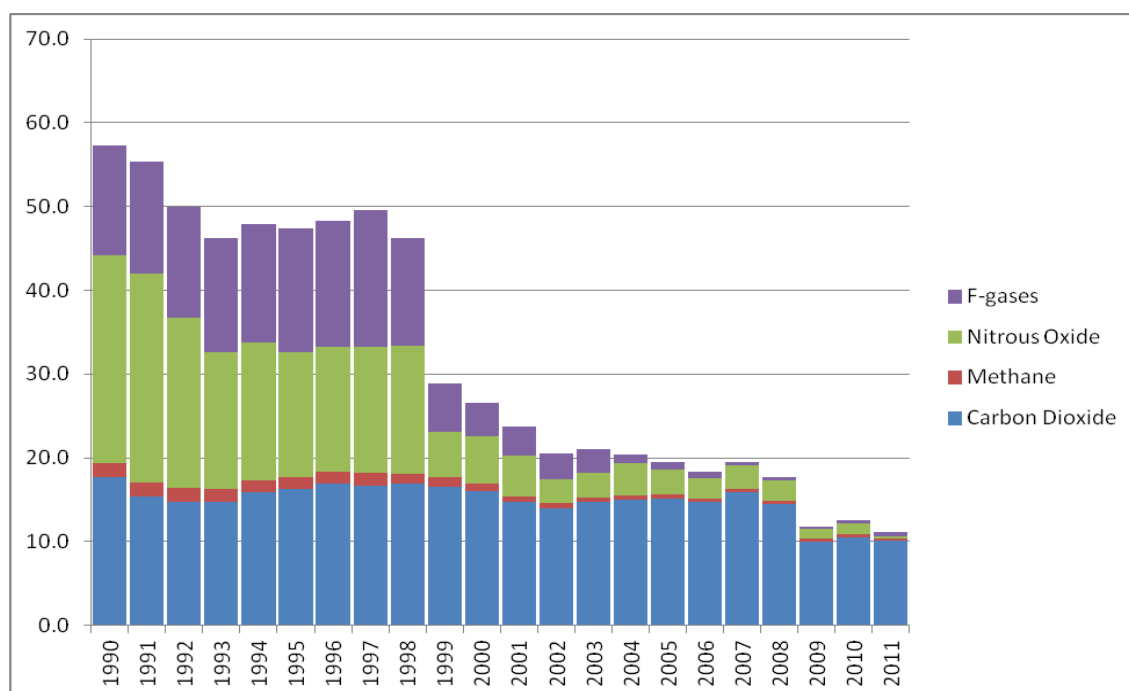
The breakdown of emissions by gas for selected years since 1990 is shown in Table 13 below. The trend over the period is shown in Figure 17.

**Table 13: Industrial process sector emissions by gas, 1990-2011 (MtCO<sub>2</sub>e)**

	1990	1995	2000	2005	2008	2009	2010	2011
Carbon dioxide	17.7	16.3	16.0	15.2	14.5	10.0	10.5	10.1
Methane	1.7	1.4	0.9	0.4	0.4	0.4	0.3	0.3
Nitrous oxide	24.7	14.9	5.6	3.0	2.5	1.2	1.4	0.2
F-gases	13.1	14.8	4.0	0.9	0.4	0.3	0.4	0.4
Total	57.3	47.4	26.6	19.5	17.7	11.8	12.6	11.1

All figures are for the UK and Crown Dependencies only, and exclude Overseas Territories.

**Figure 17: Greenhouse gas emissions from industrial processes, 1990-2011 (MtCO<sub>2</sub>e)**





## ***Land Use, Land Use Change and Forestry (LULUCF)***

For the LULUCF sector, emissions measured by end-user are the same as those measured by source, since no emissions from the energy supply sector are reallocated to LULUCF.

The LULUCF sector acted as a net sink of UK greenhouse gas emissions in 2011, dominated by carbon dioxide.

### ***Context – 1990 to 2010***

Between 1990 and 2010, the UK went from being a net source of LULUCF emissions to a net sink. This was largely due to changes in land use over the period. In general, land being converted to cropland is the dominant source of CO<sub>2</sub> emissions, and forest land which remains as forest land is the dominant sink. The downward trend in net emissions over the period has largely been driven by forest land, with an increasing uptake of CO<sub>2</sub> by trees as they reach maturity, in line with the historical planting pattern. There has also been some reduction in emissions since 1990 due to less intensive agricultural practices.

### ***2011 results***

Between 2010 and 2011, net emissions from the LULUCF sector increased slightly, by around 0.4 MtCO<sub>2</sub>e, largely due to the fact that forest land which has until now acted as a sink has now passed maturity, resulting in a lower uptake of CO<sub>2</sub> by trees.

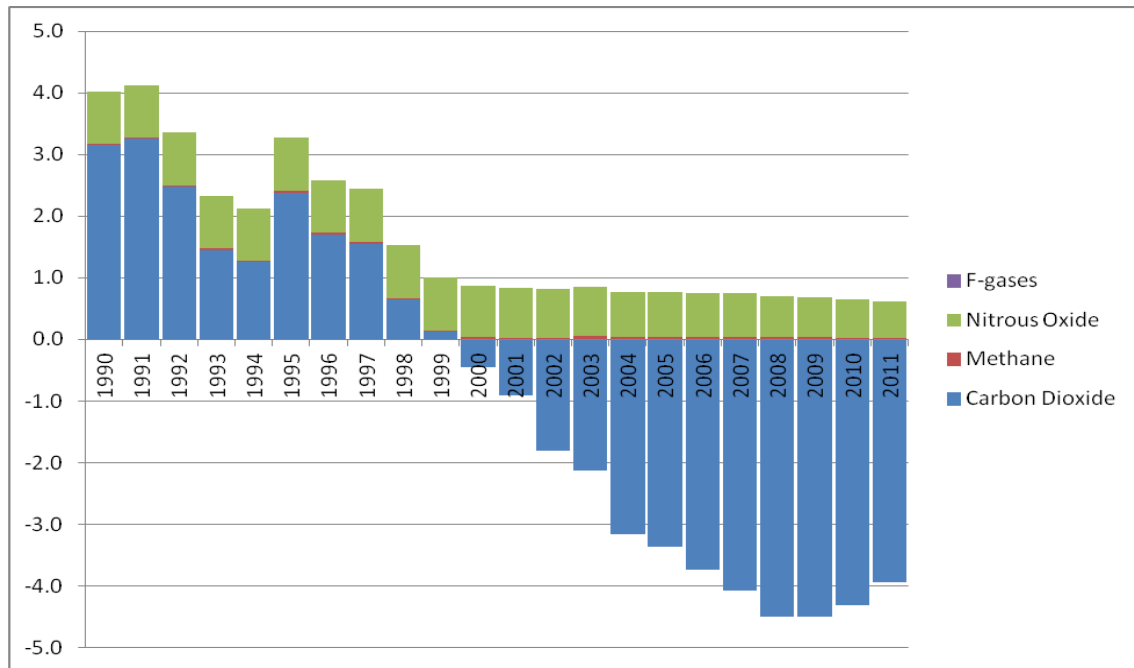
The breakdown of emissions and removals by gas for selected years since 1990 is shown in Table 14 below. The trend over the period is shown in Figure 18.

**Table 14: LULUCF sector emissions by gas, 1990-2011 (MtCO<sub>2</sub>e)**

	1990	1995	2000	2005	2008	2009	2010	2011
Carbon dioxide	3.1	2.4	-0.4	-3.4	-4.5	-4.5	-4.3	-3.9
Methane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitrous oxide	0.8	0.9	0.8	0.7	0.7	0.7	0.6	0.6
F-gases	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	4.0	3.3	0.4	-2.6	-3.8	-3.8	-3.7	-3.3

All figures are for the UK and Crown Dependencies only, and exclude Overseas Territories.

**Figure 18: Greenhouse gas emissions from the LULUCF sector, 1990-2011 (MtCO<sub>2</sub>e)**



## Uncertainties around the 2011 estimates

We are now also able to publish the uncertainty ranges associated with the final 2011 emissions estimates by source, as published on 5<sup>th</sup> February 2013.

Table 15 below shows the uncertainty ranges by gas, and table 16 shows the ranges by sector. As can be seen, the greatest certainty we have is in relation to our estimates of carbon dioxide emissions, largely due to the low level of uncertainty around the underlying energy data. By contrast, the uncertainty around nitrous oxide emissions, particularly from the agriculture sector, is very high.

**Table 15: Uncertainties by gas, 2011 (MtCO<sub>2</sub>e)**

	2011 emissions	Uncertainty around 2011 estimate, expressed as a 95% confidence interval	
		Lower bound	Upper bound
Carbon dioxide	460.7	453.0	468.2
Methane	42.1	36.3	49.3
Nitrous Oxide	34.4	7.7	103.8
Hydrofluorocarbons	14.6	13.9	15.4
Perfluorocarbons	0.33	0.28	0.37
Sulphur hexafluoride	0.61	0.52	0.69
<b>Total</b>	<b>552.7</b>	<b>521.8</b>	<b>622.4</b>

Figures include emissions for the UK, Crown Dependencies and the Overseas Territories.

**Table 16: Uncertainties by sector, 2011 (MtCO<sub>2</sub>e)**

	2011 emissions	Uncertainty around 2011 estimate, expressed as a 95% confidence interval	
		Lower bound	Upper bound
Energy Supply	192.1	187.8	195.2
Transport	119.1	116.6	121.6
Residential	69.9	68.6	71.4
Business	89.2	86.6	93.5
Public	7.1	7.1	7.2
Industrial Process	10.2	10.0	10.5
Agriculture	51.0	24.5	120.1
Land Use Change	-3.3	-10.1	3.2
Waste Management	17.3	11.6	25.0
<b>Total</b>	<b>552.8</b>	<b>522.0</b>	<b>622.5</b>

Figures include emissions for the UK, Crown Dependencies and the Overseas Territories.

## **Revisions to the estimates of end-user emissions**

It should be noted that the historical time series of emissions by end-user is revised each year to reflect any revisions made to either the estimates of emissions by source or the other energy consumption data used in the end-user emissions calculation. In this publication, this has resulted in revisions to some end-user emissions figures for all years up to and including 2010. Further details of these revisions can be found in the [National Statistics release of 5<sup>th</sup> February 2013](#), which covered 2011 UK greenhouse gas emissions by source.

## **UK performance against emissions reduction targets**

The UK has both international and domestic targets for reducing greenhouse gas emissions; these are the Kyoto Protocol target and the Carbon Budgets set out under the UK Climate Change Act respectively.

In reporting emissions reductions against these targets, the UK is required to take account of emissions trading through the various flexible mechanisms which have been established, including the European Union Emissions Trading System (EU ETS).

DECC reported on performance against these targets in detail in the [National Statistics release of 5<sup>th</sup> February 2013](#), which covered 2011 UK greenhouse gas emissions final figures. Performance was reported so as to take account of the latest available EU ETS results, also covering the 2011 calendar year. Since these are still the latest available results from the EU ETS, it is not possible to produce a further update showing performance against targets based on the provisional 2012 emissions estimates – we will not be able to do so until after the 2012 EU ETS results become available in May 2013.

## **Future updates to emissions estimates**

Final estimates of UK greenhouse gas emissions for 2012 will be published as National Statistics in early February 2014. These estimates will be based on the UK's National Atmospheric Emissions Inventory for 2012, to be produced for DECC and the Devolved Administrations by Ricardo-AEA.

## **Further information and feedback**

Any enquiries or comments in relation to this statistical release 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 6563

The lead statistician for this publication is John Mackintosh.

Further information on climate change statistics, including Excel downloads of all the data used to compile this statistical release, can be found on the [UK Greenhouse Gas Emissions Statistics section of the Gov.uk website](#).

## Notes for Editors

1. A full set of data tables can be accessed via the UK greenhouse gas emissions pages of the Gov.uk website.
2. The figures for 1990 to 2011 in this statistical release are from the National Atmospheric Emissions Inventory (NAEI), produced for DECC and the Devolved Administrations by Ricardo-AEA. Additional results will be released as they become available, including a full report to be published in April. For further information on the UK Greenhouse Gas Inventory, see the [NAEI web site](#).
3. There are uncertainties associated with all estimates of greenhouse gas emissions. Although for any given year considerable uncertainties may surround the emissions estimates for a pollutant, it is important to note that trends over time are likely to be much more reliable. It is also important to note that the provisional 2012 estimates are subject to a greater range of uncertainty than the final figures for earlier years. For more information on these uncertainties see the page on the [UK greenhouse gas inventory](#) on the Gov.uk website.
4. Further details of the European Union Emissions Trading System can be found at the [EU ETS section of the Gov.uk website](#).
5. Detailed UK temperature data can be found on both the [Met Office website](#) and the [DECC Energy Statistics section of the Gov.uk website](#).
6. When emissions are measured on this basis, UK emissions account for around 2 per cent of the global total, based on a range of estimates produced by the UN, the IEA, the World Resources Institute and the EIA, amongst others.

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**Table 17: UK Greenhouse Gas Emissions 1990-2012 (provisional), headline results**

**Greenhouse gas emissions: weighted by global warming potential (million tonnes carbon dioxide equivalent)**

Greenhouse gas emissions weighted by global warming potential (million tonnes carbon dioxide equivalent)												
		1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012 (p)
Net CO <sub>2</sub> emissions (emissions minus removals)	Energy supply	241.5	210.0	203.0	216.5	222.4	217.2	212.5	189.5	195.3	182.2	192.1
	<i>from power stations</i>	203.5	163.4	158.5	172.8	182.0	177.8	172.7	151.1	156.6	144.2	156.1
	<i>other Energy supply</i>	38.0	46.6	44.5	43.7	40.5	39.4	39.8	38.4	38.7	37.9	36.0
	Business	112.8	106.6	107.0	97.1	94.0	92.3	90.1	78.5	78.5	75.6	79.2
	Transport	119.5	119.8	124.8	128.9	129.8	131.1	125.5	120.7	119.1	117.4	116.0
	Public	13.0	12.7	11.5	11.0	10.0	9.3	9.3	8.2	8.4	7.1	7.4
	Residential	79.0	80.8	87.1	84.3	81.7	78.1	79.9	74.7	86.5	66.4	74.2
	Agriculture	5.2	5.3	4.8	4.6	4.3	4.1	4.1	4.1	4.1	4.2	4.2
	Industrial process	16.6	15.2	15.0	14.8	14.1	15.3	14.0	9.2	9.9	9.5	9.8
	Waste Management	1.3	0.9	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	LULUCF	3.1	2.4	-0.4	-3.4	-3.7	-4.1	-4.5	-4.5	-4.3	-3.9	-3.9
Total CO <sub>2</sub>	592.0	553.8	553.1	554.1	552.7	543.6	531.2	480.7	497.8	458.6	479.1	
Other greenhouse gases	180.9	160.0	122.8	102.9	100.2	98.6	96.7	93.6	93.9	92.1	90.7	
<b>Kyoto greenhouse gas basket</b>		769.7	711.0	675.2	659.0	655.0	644.7	630.5	576.8	594.0	552.6	571.6

**A correction has been made to the figures in red.**

**Notes**

1. Figures shown for 2012 are provisional.
2. Provisional 2012 CO<sub>2</sub> emissions for the agriculture, waste and LULUCF sectors have not been estimated; 2011 estimates have been used for this component of the provisional estimates of total UK emissions.
3. Kyoto basket total differs slightly from sum of individual pollutants above as the basket uses a narrower definition for LULUCF, and includes emissions from UK Overseas Territories.
4. Emissions are presented as carbon dioxide equivalent in line with international reporting and carbon trading. To convert carbon dioxide into carbon equivalents, divide figures by 44/12.
5. The entire time series is revised each year to take account of methodological improvements in the UK emissions inventory.
6. Figures shown do not include any adjustment for the effect of the EU Emissions Trading System (EUETS), which was introduced in 2005.

**Table 18: UK Carbon Dioxide Emissions by fuel, 1990-2012 (provisional)**

<b>Carbon dioxide emissions (million tonnes)</b>											
	<b>1990</b>	<b>1995</b>	<b>2000</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012(p)</b>
Gas	145.0	187.3	240.4	234.5	226.5	228.8	234.2	213.3	227.6	193.2	187.1
Oil	191.0	178.6	166.0	169.8	166.4	165.7	159.6	151.6	150.9	145.0	143.5
Coal	217.7	151.4	116.7	124.6	136.4	125.9	115.2	95.8	100.0	100.7	129.0
Other solid fuels	15.2	12.4	11.7	9.3	8.4	8.0	9.3	9.2	8.1	8.0	8.3
Non-fuel	23.1	24.1	18.3	16.0	15.1	15.2	12.9	10.8	11.2	11.7	11.3
<b>Total</b>	<b>592.0</b>	<b>553.8</b>	<b>553.1</b>	<b>554.1</b>	<b>552.7</b>	<b>543.6</b>	<b>531.2</b>	<b>480.7</b>	<b>497.8</b>	<b>458.6</b>	<b>479.1</b>

**Notes**

1. Figures shown for 2012 are provisional.



**Table 19: UK emissions of all greenhouse gases, carbon dioxide, methane and nitrous oxide, 2010-11, by source and end-user, National Communication categories**

Greenhouse Gas	NC Category	Source			End User		
		2010	2011	% change	2010	2011	% change
All Greenhouse gases (million tonnes carbon dioxide equivalent)	Energy Supply	204.3	190.9	-6.5	-	-	-
	Business	91.9	89.1	-3.0	183.0	175.0	-4.4
	Transport	120.1	118.5	-1.4	136.8	134.8	-1.4
	Public	8.4	7.1	-15.2	17.9	15.9	-10.9
	Residential	89.9	69.7	-22.5	157.8	130.5	-17.2
	Agriculture	51.2	51.2	0.0	53.7	53.6	-0.2
	Industrial Process	11.7	10.2	-12.8	12.6	11.1	-11.9
	Land Use Change	-3.7	-3.3	-9.7	-3.7	-3.3	-9.7
	Waste Management	17.9	17.3	-3.3	17.9	17.3	-3.3
	Exports	-	-	-	15.9	15.8	-0.4
<b>Total</b>		<b>591.7</b>	<b>550.7</b>	<b>-6.9</b>	<b>591.7</b>	<b>550.7</b>	<b>-6.9</b>
Carbon dioxide (million tonnes)	Energy Supply	195.3	182.2	-6.7	-	-	-
	Business	78.5	75.6	-3.7	166.1	157.9	-5.0
	Transport	119.1	117.4	-1.4	135.1	133.1	-1.5
	Public	8.4	7.1	-15.2	17.4	15.5	-11.0
	Residential	86.5	66.4	-23.3	150.9	124.1	-17.8
	Agriculture	4.1	4.2	1.3	6.6	6.5	-0.8
	Industrial Process	9.9	9.5	-4.1	10.5	10.1	-3.6
	Land Use Change	-4.3	-3.9	-8.8	-4.3	-3.9	-8.8
	Waste Management	0.3	0.3	-2.5	0.3	0.3	-2.5
	Exports	-	-	-	15.2	15.1	-1.0
<b>Total</b>		<b>497.8</b>	<b>458.6</b>	<b>-7.9</b>	<b>497.8</b>	<b>458.6</b>	<b>-7.9</b>
Methane (thousand tonnes)	Energy Supply	359.7	349.5	-2.8	-	-	-
	Business	11.3	11.3	-0.3	151.9	154.3	1.6
	Transport	3.8	3.4	-11.6	25.2	27.4	8.9
	Public	0.8	0.7	-15.3	18.5	17.5	-5.6
	Residential	24.3	22.2	-8.8	169.2	150.4	-11.1
	Agriculture	854.8	850.6	-0.5	857.8	853.6	-0.5
	Industrial Process	5.4	4.7	-12.8	16.3	14.5	-11.1
	Land Use Change	1.2	1.4	16.0	1.2	1.4	16.0
	Waste Management	778.2	750.5	-3.6	778.2	750.5	-3.6
	Exports	-	-	-	21.3	24.6	15.6
<b>Total</b>		<b>2039.5</b>	<b>1994.1</b>	<b>-2.2</b>	<b>2039.5</b>	<b>1994.1</b>	<b>-2.2</b>
Nitrous oxide (thousand tonnes)	Energy Supply	4.6	4.7	2.9	-	-	-
	Business	3.2	3.0	-6.4	5.1	4.9	-3.0
	Transport	3.0	3.1	3.1	3.6	3.7	3.9
	Public	0.0	0.0	-6.0	0.2	0.2	-0.5
	Residential	0.4	0.4	-12.0	1.8	1.7	-5.4
	Agriculture	94.0	94.1	0.2	94.0	94.2	0.2
	Industrial Process	4.4	0.8	-82.2	4.4	0.8	-81.7
	Land Use Change	2.0	1.9	-4.2	2.0	1.9	-4.2
	Waste Management	4.1	4.0	-0.4	4.1	4.0	-0.4
	Exports	-	-	-	0.5	0.6	13.8
<b>Total</b>		<b>115.7</b>	<b>112.1</b>	<b>-3.1</b>	<b>115.7</b>	<b>112.1</b>	<b>-3.1</b>