1st February 2011

STATISTICAL RELEASE

UK CLIMATE CHANGE SUSTAINABLE DEVELOPMENT INDICATOR: 2009 GREENHOUSE GAS EMISSIONS, FINAL FIGURES

DECC today publishes final 2009 estimates of UK greenhouse gas emissions.

Greenhouse gas emissions - headline results

- In 2009, UK emissions of the basket of six greenhouse gases covered by the Kyoto Protocol were estimated to be 566.3 million tonnes carbon dioxide equivalent ($MtCO_2e$). This was 8.7 per cent lower than the 2008 figure of 620.5 million tonnes. Between 2008 and 2009 there were decreases in emissions in all sectors, including 11.0 per cent (24.2 $MtCO_2e$) from the energy supply sector, 11.8 per cent (11.5 $MtCO_2e$) from the business sector, 36.5 per cent (6.0 $MtCO_2e$) from industrial processes, 4.2 per cent (5.4 $MtCO_2e$) from the transport sector, and 5.8 per cent (4.8 $MtCO_2e$) in the residential sector.

- Carbon dioxide (CO_2) is the main greenhouse gas, accounting for about 84 per cent of total UK greenhouse gas emissions in 2009. In 2009, UK net emissions of carbon dioxide were estimated to be 473.7 million tonnes (Mt). This was around 9.8 per cent lower than the 2008 figure of 525.1 (Mt). There were decreases in emissions of 11.5 per cent (24.1 Mt) from the energy supply sector, 13.1 per cent (11.5 Mt) from the business sector, 4.2 per cent (5.2 Mt) from the transport sector, and 5.9 per cent (4.7 Mt) from the residential sector.

- The overall decrease in emissions has primarily resulted from two factors: a significant fall in energy consumption across all sectors, and an increase in the use of nuclear power rather than coal and natural gas for electricity generation. As the UK economy contracted during 2009, this resulted in an overall reduction in demand for electricity, together with lower fossil fuel consumption by businesses and households.

- All the sectoral breakdowns included in this statistical release 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.

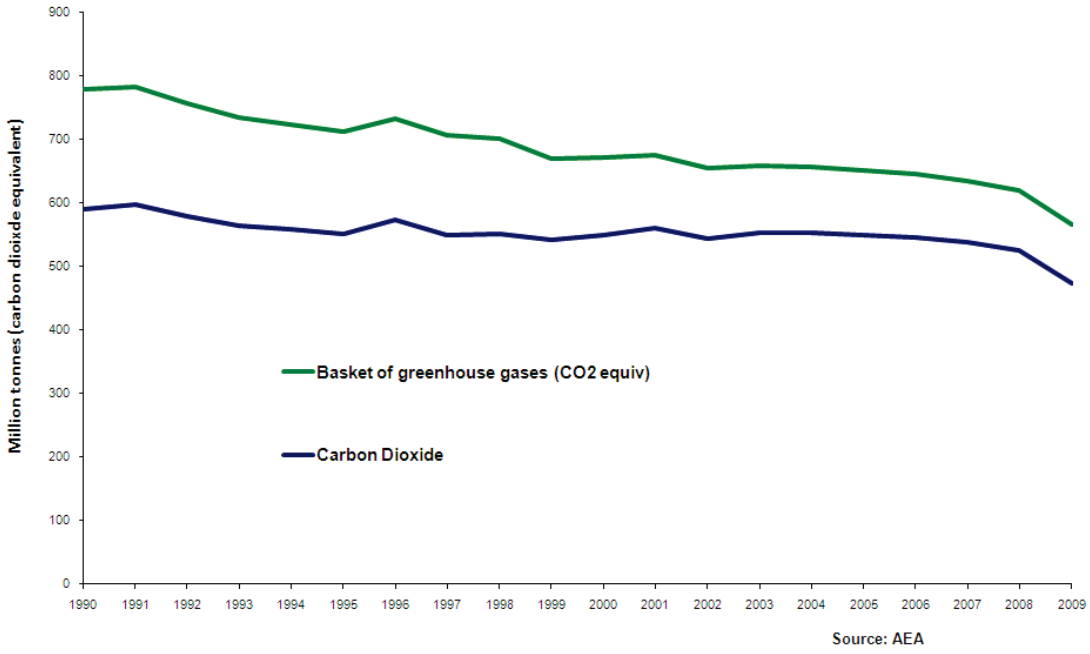
The headline results are shown in Table 1 and Figure 1 below. Note that the 2008 figures have been revised since the previous publication in February 2010; further details of this revision can be found later in this statistical release. The time series for selected years since 1990 is shown in Table 10 towards the end of this statistical release.

Table 1: Emissions of greenhouse gases

	2008	2009	Change
Total greenhouse gas emissions	620.5	566.3	-8.7%
Net carbon dioxide emissions	525.1	473.7	-9.8%

Greenhouse gas emissions are in million tonnes carbon dioxide equivalent.
CO_2 emissions figures are for the UK and Crown Dependencies; Greenhouse gas emissions figures also include some Overseas Territories.
Carbon dioxide emissions are reported as net emissions, to include removals from the atmosphere by carbon sinks. This also affects some of the other greenhouse gases, but to a lesser extent.

Figure 1: Emissions of greenhouse gases, 1990 - 2009



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_2 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. This now includes emissions from direct flights between the UK and these Territories. The Kyoto Protocol also uses a narrower definition of carbon sinks than that applied for domestic UK CO_2 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.

Reporting of greenhouse gas emissions for the UK's Carbon Budgets only includes emissions within the UK, and excludes both Crown Dependencies and Overseas Territories.

A more detailed summary of the coverage and breakdown can be found in the data tables which accompany this release, which can be accessed via the Climate Change Statistics pages of the DECC website.

Emissions by gas and source sector

Total greenhouse gases

In 2009, 35 per cent of greenhouse gas emissions were from the energy supply sector, 22 per cent from transport, 15 per cent from business and 14 per cent from residential fossil fuel use. Since 1990, emissions from the energy supply sector and from business have reduced by 28 per cent and 24 per cent respectively. Residential emissions have reduced only slightly, by around 3 per cent, since 1990, and emissions from transport were around the same level in 2009 as they were in 1990.

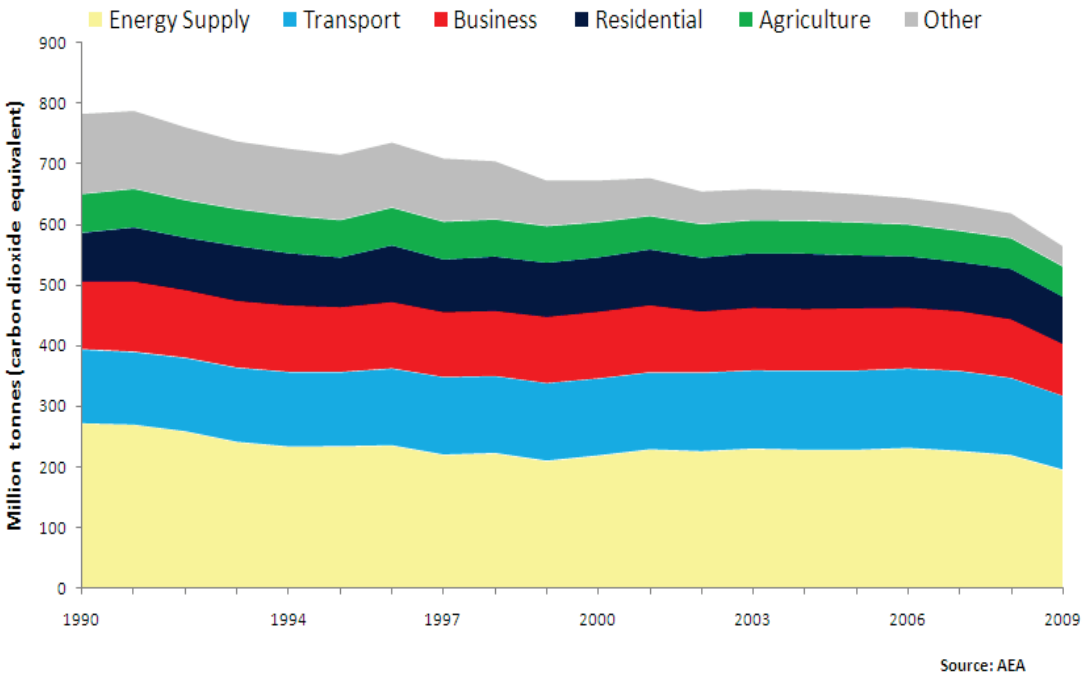
Table 2 and Figure 2 below show the breakdown of greenhouse gas emissions into the main source sectors.

Table 2: Sources of greenhouse gas emissions, 1990-2009 ($MtCO_2e$)

	1990	1995	2000	2005	2007	2008	2009
Energy Supply	272.1	233.9	218.6	227.9	226.1	219.2	195.0
Transport	122.1	122.6	127.3	131.1	132.4	127.6	122.2
Business	112.4	107.6	110.5	103.1	99.1	97.4	85.9
Residential	80.8	82.3	90.1	87.8	81.5	83.4	78.6
Agriculture	63.0	60.8	57.3	53.4	50.5	50.0	49.5
Waste Management	59.0	46.1	31.5	20.0	19.1	18.5	17.9
Industrial Process	54.3	44.8	24.4	18.0	17.9	16.4	10.4
Public	14.1	13.7	11.7	11.0	9.3	9.3	8.2
LULUCF	3.9	2.4	0.4	-3.0	-3.6	-4.0	-4.1
Total	781.6	714.3	672.0	649.4	632.2	617.7	563.6

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

Figure 2: Greenhouse gas emissions by source, 1990-2009



Carbon dioxide

Carbon dioxide accounted for about 84 per cent of the UK's man-made greenhouse gas emissions in 2009.

In 2009, 39 per cent of carbon dioxide emissions were from the energy supply sector, 24 per cent from road transport, 16 per cent from business and 16 per cent from residential fossil fuel use. Since 1990, emissions from the energy

supply sector have reduced by 23 per cent and business emissions have reduced by 31 per cent. There has also been a reduction in residential emissions since 1990, of around 5 per cent. However, emissions from road transport have increased by 3 per cent over this period.

Since 2008, there has been a reduction in emissions across all the main sectors. Emissions from energy supply and business have fallen by 12 per cent and 13 per cent respectively. Emissions from road transport have also reduced, by 4 per cent, and emissions from residential fossil fuel use are 6 per cent lower than they were in 2008.

There are a number of reasons for the fall in emissions between 2008 and 2009. In the energy supply sector, there has been a significant reduction in emissions from power stations, largely due to an overall fall in demand, but also in part due to an increase in the use of nuclear power, rather than coal and natural gas, for electricity generation. In the business sector, there has been a reduction in emissions from industry in particular, and there has also been a noticeable fall in emissions from industrial processes, which are heavily influenced by the construction industry. Although this is a relatively small sector, it has seen a fall in emissions of around 34 per cent between 2008 and 2009. In respect of road transport, the largest reduction has been in emissions from heavy goods vehicles, which are 9 per cent lower in 2009 than in 2008.

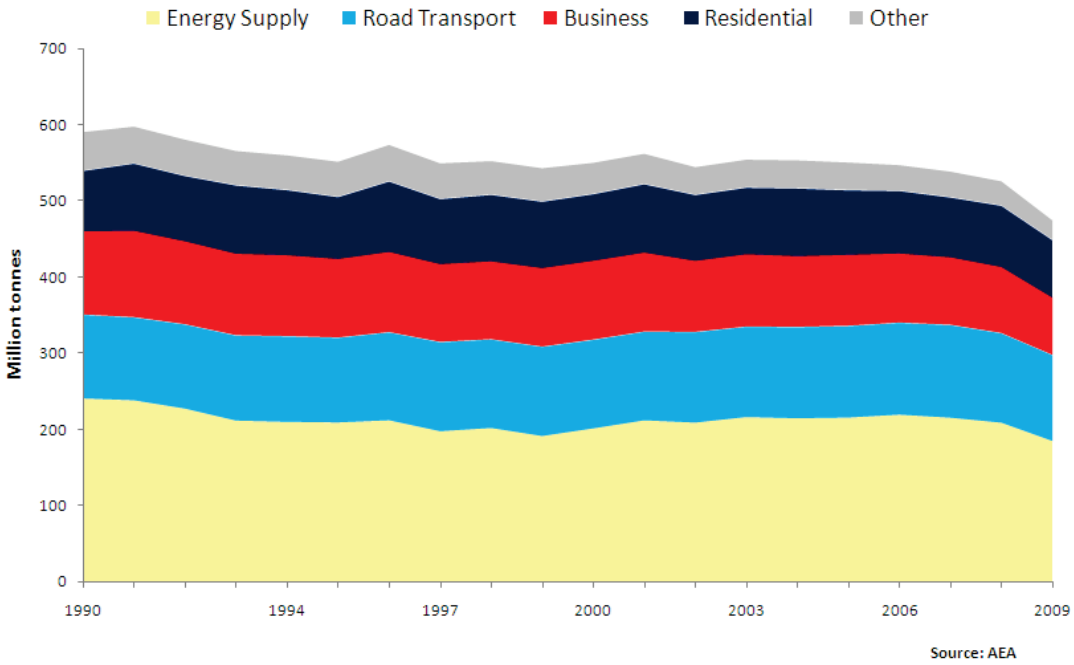
Table 3 and Figure 3 below show the breakdown of carbon dioxide emissions into the main source sectors.

Table 3: Sources of carbon dioxide emissions, 1990-2009 (Mt)

	1990	1995	2000	2005	2006	2007	2008	2009
Energy Supply	241	210	202	216	220	216	209	185
Road Transport	109	111	116	120	120	121	117	113
Business	110	104	104	94	91	89	87	76
Residential	79	81	87	84	82	78	80	75
Other	50	46	40	36	33	33	31	25
Total	590	551	549	550	546	538	525	474

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

Figure 3: Carbon dioxide emissions by source, 1990-2009



Methane

Weighted by global warming potential, methane accounted for about 8 per cent of the UK's greenhouse gas emissions in 2009.

Methane emissions, excluding those from natural sources, were 61 per cent below 1990 levels. In 2009, the main sources of methane were agriculture (41 per cent of the total) and landfill sites (37 per cent).

Emissions from landfill have reduced by 72 per cent and emissions from agriculture by 19 per cent since 1990.

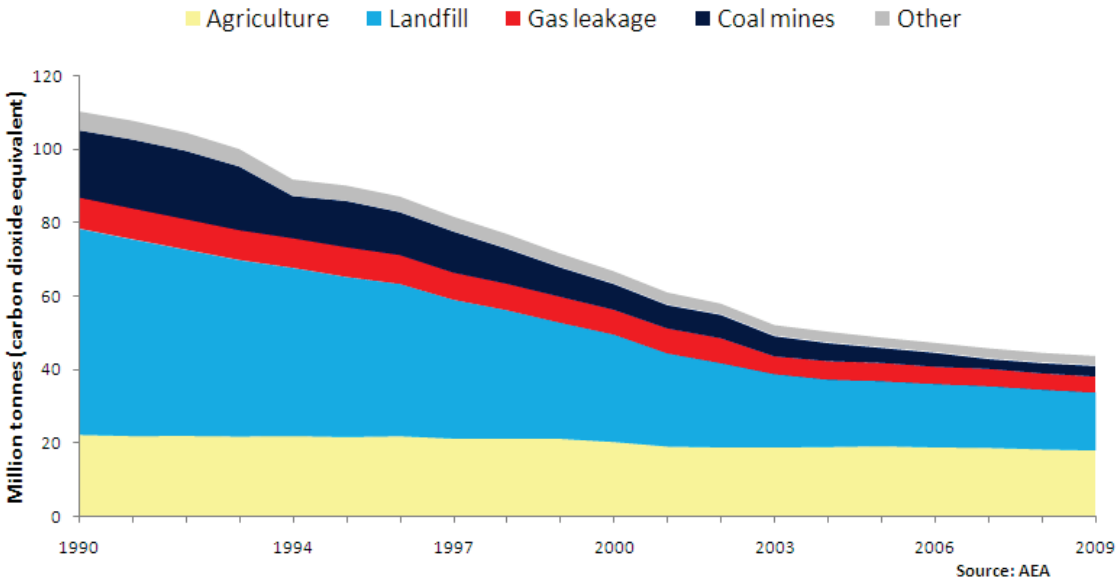
Table 4 and Figure 4 below show the breakdown of methane emissions into the main source sectors.

Table 4: Sources of methane emissions, 1990-2009 ($MtCO_2e$)

	1990	1995	2000	2005	2006	2007	2008	2009
Agriculture	22.3	21.7	20.3	19.2	18.9	18.8	18.3	18.0
Landfill	56.1	43.6	29.3	17.8	17.4	16.9	16.4	15.9
Gas leakage	8.5	8.1	6.7	4.9	4.6	4.7	4.4	4.3
Coal mines	18.3	12.6	7.0	4.1	3.8	2.6	2.8	2.9
Other	5.2	4.2	3.3	2.6	2.5	2.7	2.6	2.5
Total	110.4	90.1	66.7	48.6	47.2	45.7	44.5	43.6

All figures are for the UK and Crown Dependencies only, and exclude Overseas Territories.
Gas leakage also includes other emissions from the exploration, production and transportation of gas.

Figure 4: Methane emissions by source, 1990-2009



Nitrous oxide

Weighted by global warming potential, nitrous oxide emissions accounted for about 6 per cent of the UK's man-made greenhouse gas emissions in 2009.

Nitrous oxide emissions fell by 49 per cent between 1990 and 2009. The largest reductions were in emissions from adipic acid production between 1998 and 1999 (down 95 per cent) which is reflected in the reduction in emissions from industrial processes between these years. There was a further reduction in industrial process emissions in 2009, primarily due to decreases in the production of adipic acid and nitric acid. This leaves agriculture as the main source in 2009, accounting for 79 per cent of all nitrous oxide emissions, mainly from agricultural soils.

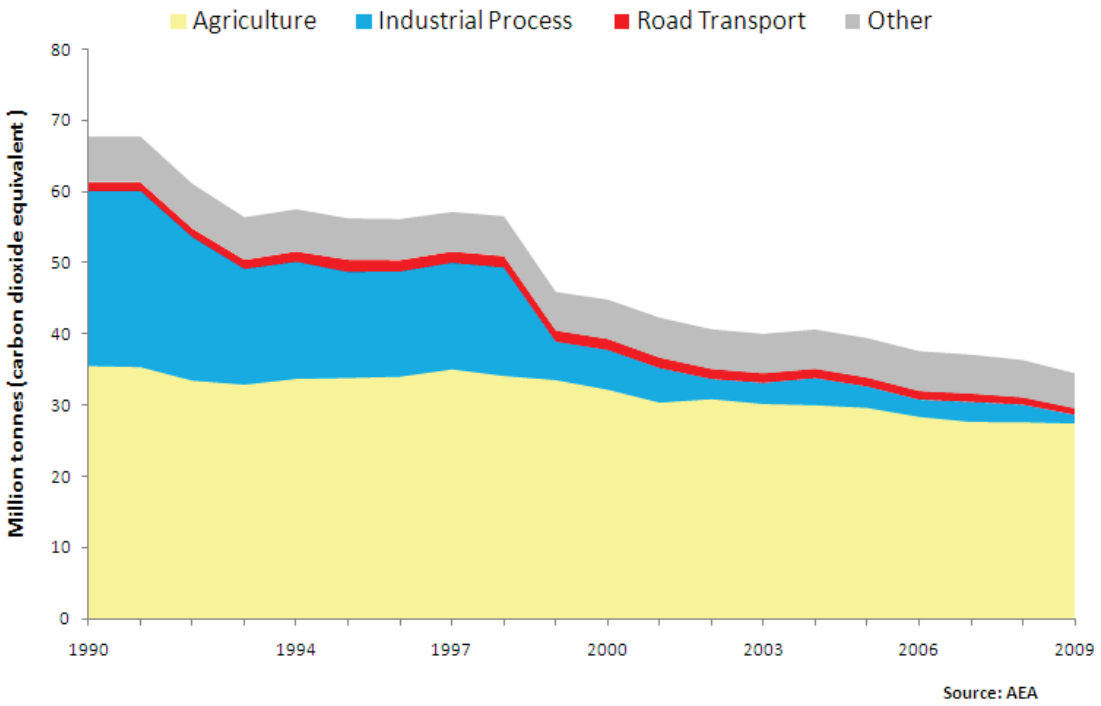
Table 5 and Figure 5 below show the breakdown of nitrous oxide emissions into the main source sectors.

Table 5: Sources of nitrous oxide emissions, 1990-2009 ($MtCO_2e$)

	1990	1995	2000	2005	2006	2007	2008	2009
Agriculture	35.5	33.8	32.2	29.6	28.3	27.6	27.6	27.4
Industrial process	24.7	14.9	5.6	3.0	2.4	2.8	2.5	1.2
Road transport	1.2	1.7	1.6	1.3	1.3	1.2	1.1	1.0
Other	6.4	5.8	5.6	5.6	5.6	5.5	5.3	5.0
Total	67.7	56.3	44.9	39.5	37.7	37.2	36.4	34.6

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

Figure 5: Nitrous oxide emissions by source, 1990-2009



Emissions from UK-based international aviation and shipping bunkers
*** This is a UK sustainable development strategy indicator ***

Emissions from international aviation and shipping can be estimated from refuelling from bunkers at UK airports and ports, whether by UK or non-UK operators. Under the reporting guidelines agreed by the UNFCCC, these emissions are not included in the UK's emissions total, but are reported as memo items in national greenhouse gas inventories. Parties to the UNFCCC are required to act to limit or reduce emissions from international services working through the International Civil Aviation Organisation (ICAO) and International Maritime Organisation (IMO).

In 2009, emissions from international aviation fuel use were estimated to be 33.0 million tonnes carbon dioxide equivalent. This was 4.3 per cent lower than the 2008 figure of 34.5 million tonnes. However, between 1990 and 2009 the level of these emissions has more than doubled. High altitude aviation also has a greenhouse effect over and above that of carbon dioxide alone, but this is not reflected in this indicator.

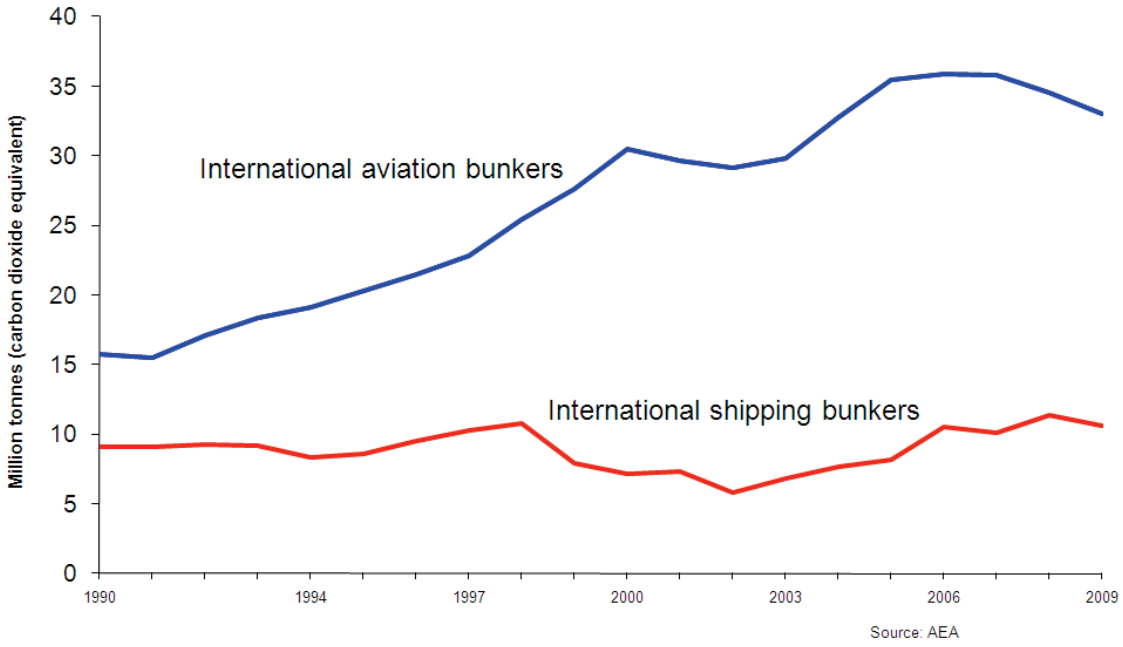
In 2009, emissions from UK international shipping bunkers were estimated to be 10.6 million tonnes carbon dioxide equivalent. This was 7.1 per cent lower than the 2008 figure of 11.4 million tonnes. Between 1990 and 1998 emissions from UK shipping bunkers increased by around 18 per cent. Emissions have subsequently decreased by around 2 per cent from the 1998 level. However, UK operators purchase most of their fuel outside the UK.

Table 6 and Figure 6 below show the international aviation and shipping emissions series from 1990 to 2009.

Table 6: Greenhouse gas emissions from UK-based international aviation and shipping bunkers, 1990-2009 ($MtCO_2e$)

	1990	1995	2000	2005	2006	2007	2008	2009
International aviation	15.8	20.3	30.4	35.5	35.9	35.8	34.5	33.0
International shipping	9.1	8.6	7.1	8.2	10.6	10.1	11.4	10.6
Total	24.9	28.9	37.6	43.6	46.5	45.8	45.9	43.6

Figure 6: Greenhouse gas emissions from UK-based international aviation and shipping bunkers, 1990-2009



Revisions to the Inventory

The UK Greenhouse Gas Inventory is reviewed every year, and the whole historical data series is revised to incorporate methodological improvements and new data. This takes into account revisions to the datasets which have been used in its compilation, most notably the UK energy statistics published in the Digest of UK Energy Statistics (DUKES). It is therefore not appropriate to compare the Inventory from one year with that from another. However, the latest Inventory represents a single consistent data series going back to 1990, and this therefore allows year-on-year comparisons to be made.

In preparing the 2009 Inventory, the most notable changes to the historical series since the 2008 Inventory was published are linked to new research which has become available in relation to a number of specific sectors, as follows.

Estimates of methane emissions from landfill waste have been revised across the whole time series, following a review of the data and assumptions used in the landfill methane emissions model. This study resulted in revisions to the estimated volume of waste going to landfill, the composition of the waste, and the categories of waste types. Changes to the moisture and carbon content of certain types of waste have, on average, increased the amount of methane generated per tonne of waste; however, updated waste activity data and the revised break-down of waste categories have combined to produce a change in our emissions estimates. These emissions are now higher than previously estimated for all years from 1990 to 1994, and lower than previously estimated for all years from 1995 to 2008. Landfill waste oxidation rates, the assignment of waste landfill types and methane emission capture rates were not updated in the 2009 Inventory, but will be considered further for the 2010 Inventory.

Estimates of emissions from domestic shipping have decreased across the whole time series, following improvements to the methodology for estimating these emissions. The new method now uses information on ship characteristics and movements within waters surrounding the UK, whereas the previous method relied wholly on marine fuel sales data. These emissions are now lower than previously estimated for all years from 1990 to 2008.

The approach used to estimate total shipping emissions (international and domestic), based on marine fuel sales data, is unchanged. Since international shipping emissions are estimated to be the difference between total shipping emissions and domestic shipping emissions, emissions from international shipping are therefore now higher than previously estimated for all years from 1990 to 2008.

Finally, there has been a change to estimated removals of CO_2 from the atmosphere for the land use, land use change and forestry (LULUCF) sector, largely due to the use of new data from the 2007 Countryside Survey, which supersedes the previous Countryside Survey from 1998. The new survey has been used to identify land use change matrices, and most significantly this has resulted in a change in the amount of land converted to cropland. There have also been a number of other revisions to the LULUCF sector. The overall result of these revisions is that removals of CO_2 from the atmosphere are now higher than previously estimated for all years from 2003 to 2008, and consequently net emissions from this sector are now lower than previously estimated over this period.

All the revisions to the Inventory have resulted in revisions to the figures for all years up to and including 2008. The total of all UK greenhouse gas emissions reported for the Kyoto Protocol in 2008 has been revised downwards from 628.3 to 620.5 million tonnes carbon dioxide equivalent. The figure for UK CO_2 emissions in 2008 has also been revised downwards, from 532.8 to 525.1 million tonnes. Comparing the 2009 figures with the 2008 figures published a year ago will therefore give a different year-on-year percentage change, but one which is incorrect and should not be used.

Revisions from provisional estimates

Provisional estimates of 2009 UK greenhouse gas and carbon dioxide emissions were published in March 2010, based on early estimates of energy consumption for the year.

At that time, it was provisionally estimated that total UK greenhouse gas emissions in 2009 would be 574.6 million tonnes of carbon dioxide equivalent, which represented a decrease of 9 per cent from the 2008 figure. Although the final 2009 figure of 566.3 million tonnes is around 1½ per cent lower than the provisional estimate, this still represents a decrease from 2008 to 2009 of around 9 per cent. This result is due to changes in the historical data series. Importantly, the trend anticipated by the provisional estimates has now been seen in the final figures.

It was also provisionally estimated that net UK carbon dioxide emissions would be 480.9 million tonnes, representing a decrease of 10 per cent from the 2008 figure. The final 2009 figure of 473.7 million tonnes is also around 1½ per cent lower than the provisional estimate, but again, this does indeed represent a decrease from 2008 to 2009 of around 10 per cent.

Differences between the provisional and final estimates arise from a combination of the range of uncertainty inherent in the provisional estimates (of the order of +/-1½ per cent), and revisions to other statistics on which these estimates were based.

UK emissions reduction targets

The UK has a number of targets, both international and domestic, for reducing greenhouse gas emissions.

These can be summarised as follows:

Kyoto Protocol target	The Kyoto Protocol uses a base year which is comprised of 1990 for carbon dioxide, methane and nitrous oxide, and 1995 for fluorinated compounds. To meet its commitment under the Protocol, the UK has agreed a legally binding target to reduce its greenhouse gas emissions to 12.5 per cent below the base year level over the period 2008-2012. In July 2007, on completion of the review of the UK Inventory, the UK's Kyoto base year figure was set at 779.9 million tonnes CO_2 equivalent, based on the 2006 UK Inventory submission. This means that to meet the UK's Kyoto commitment, greenhouse gas emissions must be below 682.4 million tonnes CO_2 equivalent on average per year over the first five year commitment period of the Protocol (2008-2012).

In accordance with this average yearly target, the Kyoto Protocol target for the UK was then set at 3,412 million tonnes carbon dioxide equivalent over the full five year period - this is now the UK's *Assigned Amount*.

For more details of the UK's Kyoto commitment, see the UK Initial Report under the Kyoto Protocol.

UK Climate Change Act

This Act includes legally binding targets for the UK to reduce its greenhouse gas emissions by at least 80 per cent by 2050, and by at least 34 per cent by 2020, both below base year levels. It also establishes a system of binding five-year carbon budgets to set the trajectory towards these targets.

Like the Kyoto Protocol, the Act uses a base year which is comprised of 1990 for carbon dioxide, methane and nitrous oxide, and 1995 for fluorinated compounds. However, this base year figure differs from that used for reporting against the Kyoto Protocol in that the baseline is revised each year to incorporate revisions made subsequent to the UK's Kyoto Protocol assigned amount having been fixed.

The Government set the first three carbon budgets in May 2009, covering the periods 2008-12, 2013-17 and 2018-2022. The first of these budgets requires that total UK greenhouse gas emissions do not exceed 3,018 million tonnes CO_2 equivalent over the five-year period 2008-12, which is about 23 per cent below the base year level on average over the period.

Table 7 below shows details of the first three carbon budgets.

Table 7: Summary of UK Carbon Budgets, 2008-2022

	Base year (actual emissions)	Budget 1 2008-2012	Budget 2 2013-2017	Budget3 2018-2022
Budget level ($MtCO_2e$)		3018	2782	2544
Equivalent average annual emissions ($MtCO_2e$)	783.1	603.6	556.4	508.8
Percentage reduction below base year levels		23%	29%	35%

The level of the third carbon budget has previously been referred to as a 34% reduction below base year levels. However, due to the revision to base year emissions, the correct figure is now around 35%.

Emissions Trading

Emissions trading results, including those from the European Union Emissions Trading System (EU ETS), are not published as National Statistics, and any results which incorporate emissions trading figures should therefore not be treated as National Statistics.

Under the UNFCCC and Kyoto Protocol, three *flexible mechanisms* were established to provide for trading of national allowances and project-based credits by Governments and emitters. These are *International Emissions Trading*, the *Clean Development Mechanism* (CDM) and *Joint Implementation* (JI). International Emissions Trading allows Government-to-Government trading of Assigned Amount Units (AAUs) between developed (*Annex I*) countries. The CDM allows Annex I countries with a target under the Kyoto Protocol to fund carbon reduction projects in developing (*non-Annex I*) countries and earn carbon credits for the avoided emissions. JI allows Annex I countries to implement emissions reduction projects in other Annex I countries, generating carbon credits which can be used for compliance with targets by the investor country.

In reporting emissions reductions against all of its targets, the UK needs to take account of emissions trading through these flexible mechanisms. At the present time, the scope of the UK's emissions trading does not extend beyond the European Union Emissions Trading System (EU ETS), although it should be noted that EU ETS participants may also use credits generated under CDM and JI projects, subject to certain limits, in order to comply with their obligations.

However, the Government will be able to include any units or credits generated through any of the Kyoto Protocol's flexible mechanisms in its future assessment of the UK's progress towards its emissions reduction targets.

The EU ETS operates as a *cap and trade* system, which means that, currently, any installation within the System in the EU is given an allocation of emissions allowances each year. If the installation's actual emissions are above this initial allocation for the year in question, then the installation must either purchase allowances through the System, or bring forward some allowances from the following year's allocation, so as to cover the deficit. Conversely, installations with a surplus of emissions compared with their cap are allowed to either sell allowances or carry them over into the following year's allocation, thus providing a financial incentive to reduce emissions. As there is a finite limit of allowances in the System (i.e. the cap), any allowances purchased should come from installations which have reduced emissions.

The System is now in the fourth year of Phase II, covering the five year period 2008-2012. Final results are currently available for each year of Phase I, which covered the three year period 2005-2007, and also for the first two years (2008 and 2009) of Phase II. Phase III, which begins in 2013, will change some of the parameters of the system, but will not change the ultimate cap and trade basis of the EU ETS.

In 2009, for the first time, the UK has been a net seller of allowances. This effectively means that installations between them either sold or carried over more emissions allowances than they purchased or brought forward. Taking emissions trading into account within the context of the UK's reported emissions, this will affect the results by increasing the level of emissions by the amount of EU ETS allowances sold in the year.

It should be noted that at the end of Phase I, the UK Government sold a small number of unallocated allowances from the new entrant reserve on the open market. Since it would not have been appropriate to incorporate these sales in the 2007 results alone, they were spread equally over each of the three years in Phase I.

In October 2010, DECC published an Environment Agency report summarising the 2009 EU ETS results. Further details of the System can also be found at the EU ETS section of the DECC website.

Table 8 below shows the UK's net trading position in each year since the System commenced in 2005. For example, in 2009 the UK sold allowances totalling 13.7 $MtCO_2e$, which should be taken into account when reporting emissions against targets.

Table 8: EU ETS net trading position, 2005-2009 ($MtCO_2e$)

	2005	2006	2007	2008	2009
Net purchases/(sales) by UK installations	27.1	33.2	27.5	19.9	(13.7)
Net purchases/(sales) by UK Government	(1.9)	(1.9)	(1.9)	-	-
Net UK purchases/(sales)	25.2	31.3	25.6	19.9	(13.7)

It should be noted that, for the purposes of reporting for UK Carbon Budgets under the Climate Change Act, the figure for Net UK purchases/(sales) in 2009 will be slightly lower, at 13.5 $MtCO_2e$. This is due to differences in both the coverage of the Act and the way in which the annual cap in 2009 has been calculated.

Further details of progress towards the UK carbon budgets will be included in the annual statement of emissions, required under section 16 of the Climate Change Act. In respect of 2009, this must be laid before Parliament no later than 31st March 2011.

The statement will provide a clear and thorough explanation of how the "net UK carbon account" – which is what we use to determine compliance with the carbon budgets – was calculated, and what it amounts to. It will contain details of UK emissions and removals on a carbon budgets (i.e. UK only) basis, and the details of where carbon units have been used, in accordance with the

methodologies contained in the Carbon Accounting Regulations 2009 and Carbon Accounting (Amendment) Regulations 2009.

UK performance against emissions reduction targets

Performance measured against targets, *incorporating the net EU ETS trading position*, can be summarised as follows:

- UK emissions of the basket of six greenhouse gases covered by the Kyoto Protocol were 25.6 per cent lower in 2009 than in the base year, down from 779.9 to 580.0 million tonnes carbon dioxide equivalent.

- For the purposes of carbon budgets reporting, UK greenhouse gas emissions were 26.5 per cent lower in 2009 than in the base year, down from 783.1 to 575.3 million tonnes carbon dioxide equivalent.

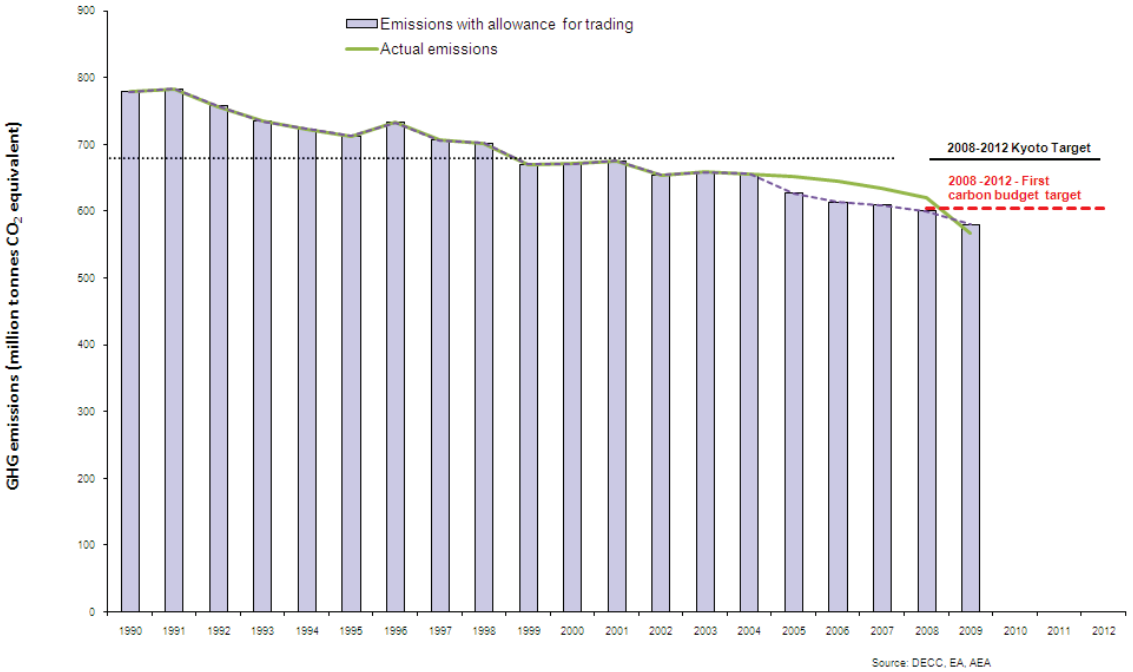
These results are shown in the context of the headline results in Table 9 and Figure 7 below. A more detailed summary of the results can also be found in Table 11 at the end of this release.

Table 9: Performance against emissions reduction targets

		Base year emissions	2009	
			Emissions	Change from base year
All greenhouse gases – Kyoto Protocol coverage (UK, Crown Dependencies & Overseas Territories)	Actual emissions (no allowance for trading)	779.9	566.3	-27.4%
	Emissions with allowance for trading	*779. 9*	*580.0*	*-25.6%*
All greenhouse gases – UK Carbon Budgets coverage (UK only)	Actual emissions (no allowance for trading)	783.1	561.8	-28.3%
	Emissions with allowance for trading	*783.1*	*575.3*	*-26.5%*

Emissions are in million tonnes carbon dioxide equivalent.

Figure 7: UK's progress towards meeting each of its targets



Future updates to emissions estimates

On Thursday 31st March 2011 we will be publishing a breakdown of 2009 UK emissions by end-user sector and fuel type, to supplement the source sector breakdown published today.

On the same date we will also be publishing provisional estimates of UK greenhouse gas emissions for 2010 as National Statistics. This will coincide with the publication of *Energy Trends*, which will include the first estimates of 2010 UK energy consumption.

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 the following address:

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 DECC website at:

http://www.decc.gov.uk/en/content/cms/statistics/climate_change/climate_change.aspx

Notes for Editors

1. A full set of data tables can be accessed via the Climate Change Statistics pages of the DECC website.

2. This Statistical Release and the related data tables are the first release of data from the National Atmospheric Emissions Inventory (NAEI) for 1970-2009, produced for DECC and the Devolved Administrations by AEA. Additional results will be released as they become available, including a full report published later in the year. For further information on the UK Greenhouse Gas Inventory, see the NAEI web site.

3. Further information about the Kyoto Protocol can be found on the UNFCCC's website.

4. Results from the EU ETS are not currently published as National Statistics. They have therefore not been incorporated in the headline results.

5. There are uncertainties associated with all estimates of greenhouse gas emissions. However, 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. For more information on these uncertainties see the page on *"How UK emissions of greenhouse gases are measured"* on the DECC website.

6. Under the Climate Change Act, the annual statement of emissions for 2009 must be laid before Parliament and published no later than 31st March 2011. This will give details of the net UK carbon account for 2009, which is used to determine compliance with the targets and budgets under the Act.

7. The climate change indicator, and the additional aviation and shipping indicator, are two of the 68 indicators supporting the Government's Sustainable Development Strategy.

8. Revisions were made to previously published figures in the 2009 greenhouse gas inventory for a number of reasons, including the following:

   Details of the study which has led to revisions of our estimates of methane emissions from landfill waste can be found on the Publications sections of the DECC website.

   Details of the study which has led to improvements in our estimates of shipping emissions can be found on the UK Air Quality Archive.

   Details of the 2007 Countryside Survey can be found on the Countryside Survey website.

   The latest UK energy statistics, including revisions to earlier years' data, can be found in the 2010 Digest of UK Energy Statistics.

9. Similar results for non-greenhouse gas atmospheric pollutants, covering the period 1970-2009, were published in December 2010.

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Table 10: UK Greenhouse Gas Emissions 1990-2009, headline results

Greenhouse gas emissions: actual emissions in tonnes

	Units (tonnes)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Net CO_2 emissions (emissions minus removals)	Million	589.7	550.8	549.4	561.3	543.7	553.4	552.6	549.7	546.3	537.8	525.1	473.7
Methane (CH_4)	Million	5.3	4.3	3.2	2.9	2.8	2.5	2.4	2.3	2.2	2.2	2.1	2.1
Nitrous Oxide (N_2O)	Million	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Hydrofluorocarbons (HFC)	Thousand	0.98	2.11	3.94	4.49	5.20	5.62	5.95	6.35	6.54	6.52	6.64	6.60
Perfluorocarbons (PFC)	Thousand	0.20	0.06	0.06	0.05	0.04	0.04	0.05	0.04	0.04	0.03	0.03	0.02
Sulphur hexafluoride (SF_6)	Thousand	0.04	0.05	0.08	0.06	0.06	0.06	0.05	0.05	0.04	0.03	0.03	0.03

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

	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Net CO_2 emissions (emissions minus removals)	589.7	550.8	549.4	561.3	543.7	553.4	552.6	549.7	546.3	537.8	525.1	473.7
Methane (CH_4)	110.4	90.1	66.7	60.9	57.9	52.0	50.2	48.6	47.2	45.7	44.5	43.6
Nitrous Oxide (N_2O)	67.7	56.3	44.9	42.4	40.7	40.1	40.7	39.5	37.7	37.2	36.4	34.6
Hydrofluorocarbons (HFC)	11.4	15.5	8.7	9.4	9.5	10.4	9.5	10.2	10.6	10.5	10.8	10.9
Perfluorocarbons (PFC)	1.4	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1
Sulphur hexafluoride (SF_6)	1.0	1.2	1.8	1.4	1.5	1.3	1.1	1.1	0.9	0.8	0.7	0.7
Kyoto greenhouse gas basket	778.3	712.3	671.2	675.5	654.2	658.2	656.0	651.4	645.0	634.7	620.5	566.3

Notes

1. Figures for each individual gas include the Land Use, Land-Use Change and Forestry sector (LULUCF), but exclude emissions from UK Overseas Territories.
2. 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, as well as emissions from direct flights between the UK and these Territories.
3. The entire time series is revised each year to take account of methodological improvements in the UK emissions inventory.
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. Figures shown do not include any adjustment for the effect of the EU Emissions Trading System (EUETS), which was introduced in 2005.
6. Carbon dioxide emissions are reported as net emissions, to include removals from the atmosphere by carbon sinks. This also affects some of the other greenhouse gases, but to a lesser extent.

Table 11: UK Greenhouse Gas Emissions 1990-2009, progress towards the Kyoto Protocol and Carbon Budgets Targets

		Baseline	1990	1995	2000	2005	2006	2007	2008	2009
Kyoto Protocol greenhouse gas target										
No allowance for emission trading	All greenhouse gases (*including* net emissions/removals from LULUCF)	779.9	778.3	712.3	671.2	651.4	645.0	634.7	620.5	566.3
	Percentage change from baseline			-8.7%	-13.9%	-16.5%	-17.3%	-18.6%	-20.4%	-27.4%
EU ETS	Net purchases/(sales) by UK installations					27.1	33.2	27.5	19.9	-13.7
	Net purchases/(sales) by UK Government					-1.9	-1.9	-1.9	-	-
	Net UK purchases/(sales)					25.2	31.3	25.6	19.9	-13.7
With allowance for emissions trading	*All greenhouse gases (including net emissions/removals from LULUCF)*	*779.9*	*778.3*	*712.3*	*671.2*	*626.2*	*613.7*	*609.1*	*600.6*	*580.0*
	Percentage change from baseline			*-8.7%*	*-13.9%*	*-19.7%*	*-21.3%*	*-21.9%*	*-23.0%*	*-25.6%*
United Kingdom Carbon Budgets										
No allowance for emissions trading	All greenhouse gases (*including* net emissions/removals from LULUCF)	783.1							616.0	561.8
	Percentage change from baseline								-21.3%	-28.3%
EU ETS	Net purchases/(sales) by UK installations								19.3	-13.5
	Net purchases/(sales) by UK Government								-	-
	Net UK purchases/(sales)								19.3	-13.5
With allowance for emissions trading	*All greenhouse gases (including net emissions/removals from LULUCF)*	*783.1*							596.7	*575.3*
	Percentage change from baseline								-23.8%	*-26.5%*

Notes

1. Kyoto base year consists of emissions of CO_2, CH_4 and N_2O in 1990, and of HFCs, PFCs and SF_6 in 1995. Includes an allowance for net emissions from LULUCF in 1990.
2. Emissions are presented as carbon dioxide equivalent in line with international reporting and carbon trading. To convert carbon dioxide into carbon equivalent, divide figures by 44/12.
3. UK Carbon Budgets were introduced in 2008. Figures include emissions solely from the UK and exclude emissions from Crown Dependencies and UK Overseas Territories. Figures include the Land Use, Land-Use Change and Forestry sector (LULUCF).
4. The Kyoto Protocol target includes emissions from the UK, Crown Dependencies and UK Overseas Territories. The target uses a narrower definition for the LULUCF sector.
5. The entire time series is revised each year to take account of methodological improvements in the UK emissions Inventory. However, the baseline used for the Kyoto Protocol is fixed and therefore does not change when methodological changes are made to the Inventory.