DEPARTMENT OF ENERGY & CLIMATE CHANGE

31st March 2011

STATISTICAL RELEASE

UK CLIMATE CHANGE SUSTAINABLE DEVELOPMENT INDICATOR: 2010 GREENHOUSE GAS EMISSIONS, PROVISIONAL FIGURES AND 2009 GREENHOUSE GAS EMISSIONS, FINAL FIGURES BY FUEL TYPE AND END-USER

DECC today publishes provisional 2010 estimates of UK greenhouse gas emissions, together with final estimates of 2009 UK greenhouse gas emissions by fuel type and end-user.

Greenhouse gas emissions – 2010 headline results

- In 2010, UK emissions of the basket of six greenhouse gases covered by the Kyoto Protocol were provisionally estimated to be 582.4 million tonnes carbon dioxide equivalent. This was 2.8 per cent higher than the 2009 figure of 566.3 million tonnes.

- Carbon dioxide (CO_2) is the main greenhouse gas, accounting for about 84 per cent of total UK greenhouse gas emissions in 2009, the latest year for which final results are available. In 2010, UK net emissions of carbon dioxide were provisionally estimated to be 491.7 million tonnes (Mt). This was 3.8 per cent higher than the 2009 figure of 473.7 Mt.

- Between 2009 and 2010, there were increases in CO_2 emissions from most of the main sectors. The provisional estimates show increases in emissions of 13.4 per cent (10.1 Mt) from the residential sector, 3.3 per cent (6.0 Mt) from the energy supply sector, and 2.4 per cent (1.8 Mt) from the business sector. Emissions from the transport sector were relatively stable, down by just 0.1 per cent (0.2 Mt). 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_2 emissions between 2009 and 2010 resulted primarily from a rise in residential gas use, combined with fuel switching away from nuclear power to coal and gas for electricity generation.

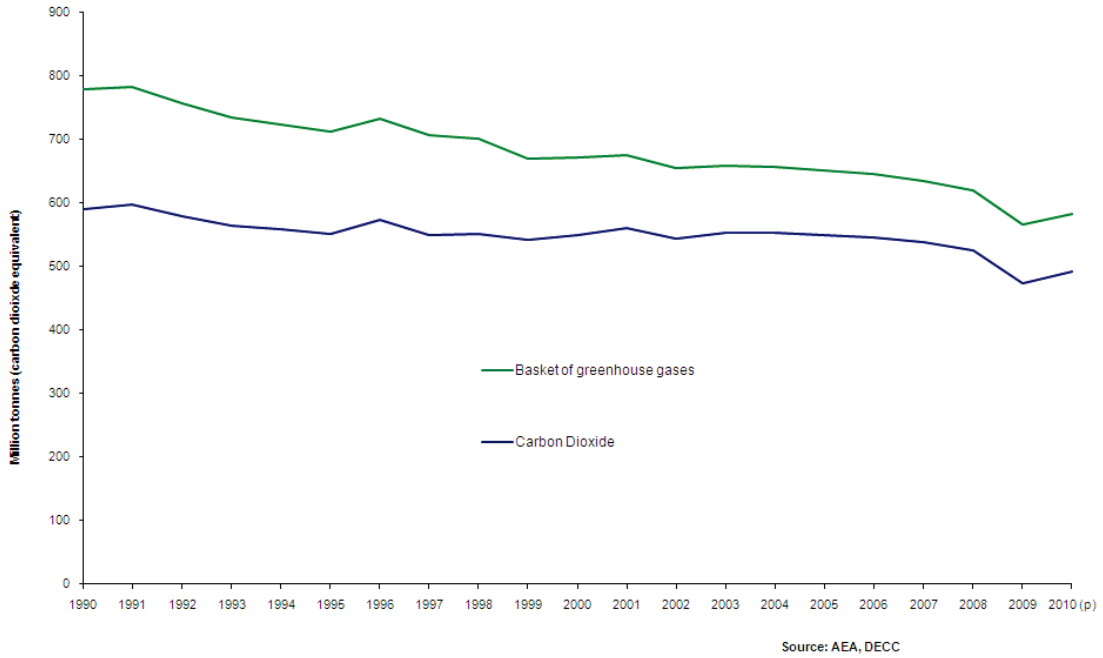
These results are shown in Table 1 and Figure 1 below. The time series since 1990 is shown in Table 7 towards the end of this statistical release.

Table 1: Emissions of greenhouse gases

	2009	2010(p)	Change
Total greenhouse gas emissions	566.3	582.4	+2.8%
Net carbon dioxide emissions	473.7	491.7	+3.8%

(p) 2010 estimates are provisional
Greenhouse gas emissions are in million tonnes carbon dioxide equivalent. Carbon dioxide emissions are in million tonnes.
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.

Figure 1: Emissions of greenhouse gases, 1990-2010 (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_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. 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.

Basis of the provisional 2010 estimates

Provisional estimates of carbon dioxide emissions are produced by DECC, 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 greenhouse gas emissions (84 per cent in 2009). 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 2009 and a repeat of the trend indicated by the last 10 years’ data (2000-2009).

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 2012; 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 National Communication sectors.

Carbon dioxide emissions by source sector

Carbon dioxide (CO_2) accounted for about 84 per cent of the UK's man-made greenhouse gas emissions in 2009.

In 2010, an estimated 39 per cent of carbon dioxide emissions were from the energy supply sector, 25 per cent from transport, 17 per cent from residential fossil fuel use and 16 per cent from business.

Between 2009 and 2010, provisional estimates indicate that CO_2 emissions from the energy supply sector increased by 3 per cent (6 Mt), emissions from transport were stable, residential emissions increased by 13 per cent (10 Mt) and business emissions increased by 2 per cent (2 Mt). All these sectoral breakdowns are based on the source of the emissions, as opposed to where the end-user activity occurred, meaning that the emissions are a result of fossil fuel consumption in the sector in question.

Since 1990, emissions from energy supply have reduced by 21 per cent and business emissions have reduced by 29 per cent, although emissions from transport have increased slightly, by 1 per cent. Emissions from the transport sector showed a general increase throughout the period up to 2007. Emissions from the residential sector have fluctuated over this period, but in 2010 were 8 per cent higher than in 1990. Within the energy supply sector, the most significant contribution to the decrease in emissions has come from power stations, emissions from which fell by 23 per cent (47 Mt) between 1990 and 2010.

The fall in UK emissions since 1990 has been accompanied by a small increase in overall energy consumption over the period, of around 2 per cent. On a temperature corrected basis however, energy consumption has fallen by around 5 per cent between 1990 and 2010. 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.

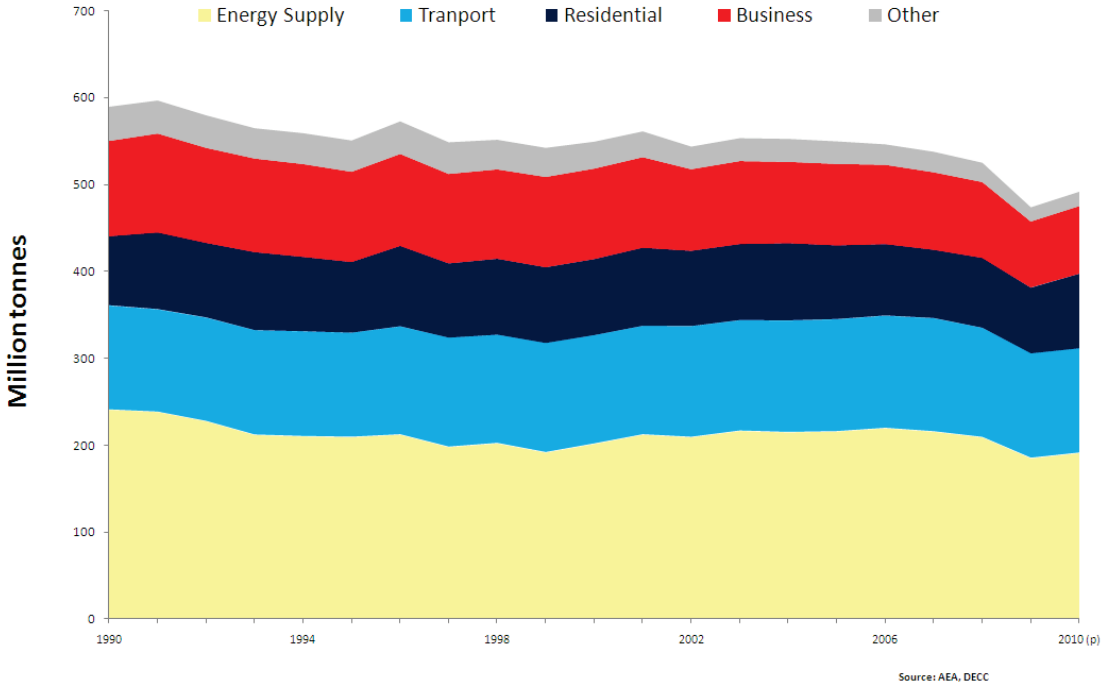
Table 2 and Figure 2 below show the breakdown of carbon dioxide emissions into the main source sectors.

Table 2: Sources of carbon dioxide emissions, 1990-2010 (provisional) (Mt)

	1990	1995	2000	2005	2006	2007	2008	2009	2010 (p)
Energy Supply	241	210	202	216	220	216	209	185	191
Transport	120	120	125	129	130	131	126	121	121
Residential	79	81	87	84	82	78	80	75	85
Business	110	104	104	94	91	89	87	76	78
Other	40	36	31	26	24	24	22	17	17
Total	590	551	549	550	546	538	525	474	492

(p) 2010 estimates are provisional.
All figures are for the UK and Crown Dependencies only, and exclude Overseas Territories.

Figure 2: Carbon dioxide emissions by source, 1990-2010 (provisional)



Energy supply

The energy supply sector was the second biggest contributor to the increase in CO_2 emissions between 2009 and 2010. Emissions from this sector were provisionally estimated to be 191.3 Mt in 2010, an increase of around 3 per cent compared to 2009.

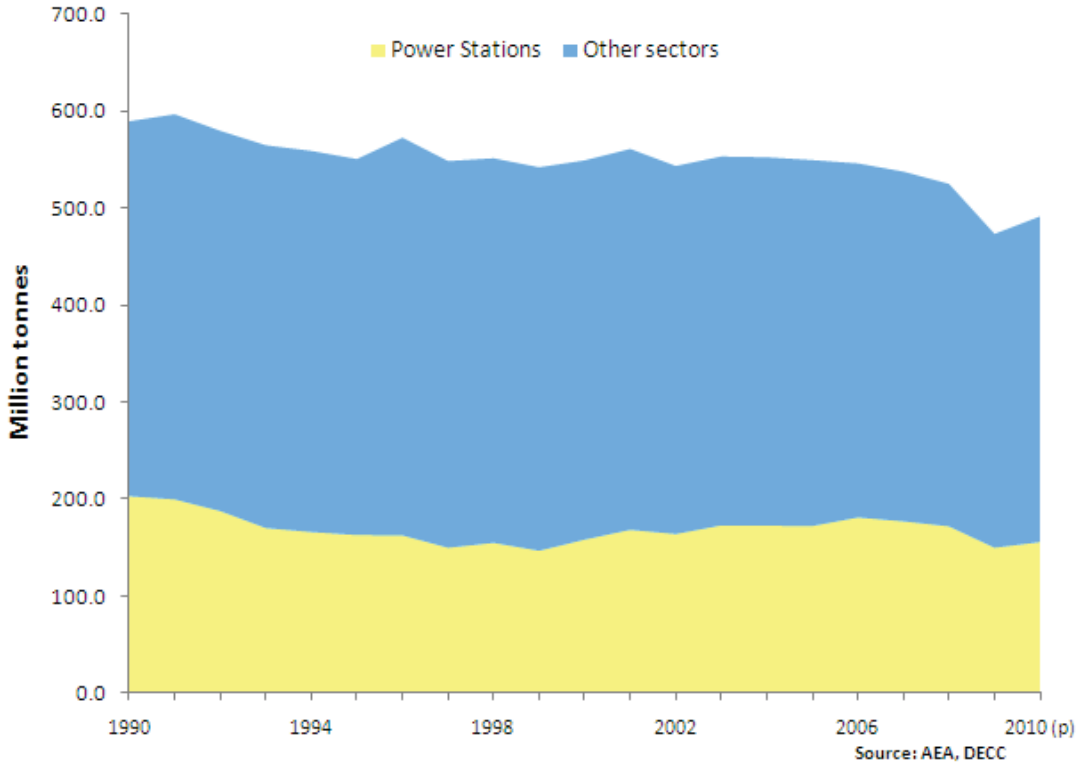
The increase in emissions from this sector since 2009 can almost entirely be attributed to power stations. Demand for electricity was slightly higher in 2010 than in 2009. Due to technical problems at some nuclear power stations, there was less nuclear power available for electricity generation, and more coal and gas were used instead. This resulted in an increase of around 4 per cent in emissions from electricity generation between 2009 and 2010. In 2010, CO_2 emissions from power stations, at 156.2 Mt, accounted for just under a third of all CO_2 emissions.

Emissions from the energy supply sector were estimated to be around 21 per cent lower in 2010 than they were in 1990. Between 1990 and 2010, final consumption of electricity increased by around 18 per cent; domestic electricity consumption in particular was almost 27 per cent higher in 2010 than in 1990. However, emissions from electricity generation have decreased by 23 per cent over the same period. In 2010, gas usage for generation remains at historically high levels, whilst use of coal in generation has roughly halved since 1990.

Figure 3 below shows the actual level of CO_2 emissions from electricity generation at power stations, together with the relative impact on total CO_2 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.

Figure 3: Carbon dioxide emissions from electricity generated at power stations, 1990-2010 (provisional)



Transport

In 2010, CO_2 emissions from the transport sector, at 121 Mt, accounted for around a quarter of all CO_2 emissions. Between 2009 and 2010, transport emissions were relatively stable; lower petrol consumption was offset by higher diesel consumption. Emissions from this sector are now slightly higher than 1990 levels.

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 2010, the residential sector, with emissions of 85 Mt, accounted for around 17 per cent of all CO_2 emissions. Between 2009 and 2010 there was a 13 per cent increase in emissions from this sector, the highest increase for any single sector, resulting from an increase in the use of all fossil fuels, gas in particular. Residential emissions are heavily influenced by external temperatures, and 2010 was, on average, the coldest year since 1986. In particular, temperatures in both the first and last quarter of the year were very low; the first quarter was the coldest since 1987, and the last quarter was the coldest since at least 1970. This was reflected in an increase in demand for space heating in 2010, which resulted in a significant increase in emissions from domestic gas use.

In 2010, emissions from this sector were estimated to be around 8 per cent higher than in 1990.

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 78 Mt, accounted for around 16 per cent of all CO_2 emissions in 2010. This was 2 per cent higher than in 2009, interrupting the downward trend in emissions from this sector experienced in recent years. Emissions from this sector were provisionally estimated to be 29 per cent below 1990 levels in 2010.

Industrial process

In 2010, CO_2 emissions from the industrial process sector were estimated to be 9 Mt, a reduction of around 2 per cent compared with 2009. Between 1990 and 2010, emissions from this sector are provisionally estimated to have decreased by around 47 per cent.

Public sector

Carbon dioxide emissions from the public sector, at 9 Mt, increased by around 5 per cent between 2009 and 2010. However, it has been provisionally estimated that there has been an overall reduction of 39 per cent in emissions from this sector between 1990 and 2010.

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

Emissions estimates for these sectors are not yet available for 2010, so the 2009 estimate has been used for this component of total UK CO_2 emissions in 2010.

On this basis, 2010 emissions from the agriculture sector, at 4 Mt, are estimated to have been 22 per cent (1 Mt) lower than in 1990. Emissions from waste management were estimated to be 0.3 Mt in 2010, while in 1990 they were estimated to be 1.2 Mt. Net land use, land use change and forestry emissions have changed from emissions of 3 Mt in 1990 to removals of 5 Mt in 2010.

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, more CO_2 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 555 tonnes of carbon dioxide per GWh in 2010 overall; within this, emissions from electricity generated from coal (872 tonnes of carbon dioxide per GWh electricity supplied) were over two times higher than for electricity supplied by gas (364 tonnes of carbon dioxide per GWh). For all sources of electricity, (including nuclear, renewables and autogeneration) the average amount of carbon dioxide emitted in 2010

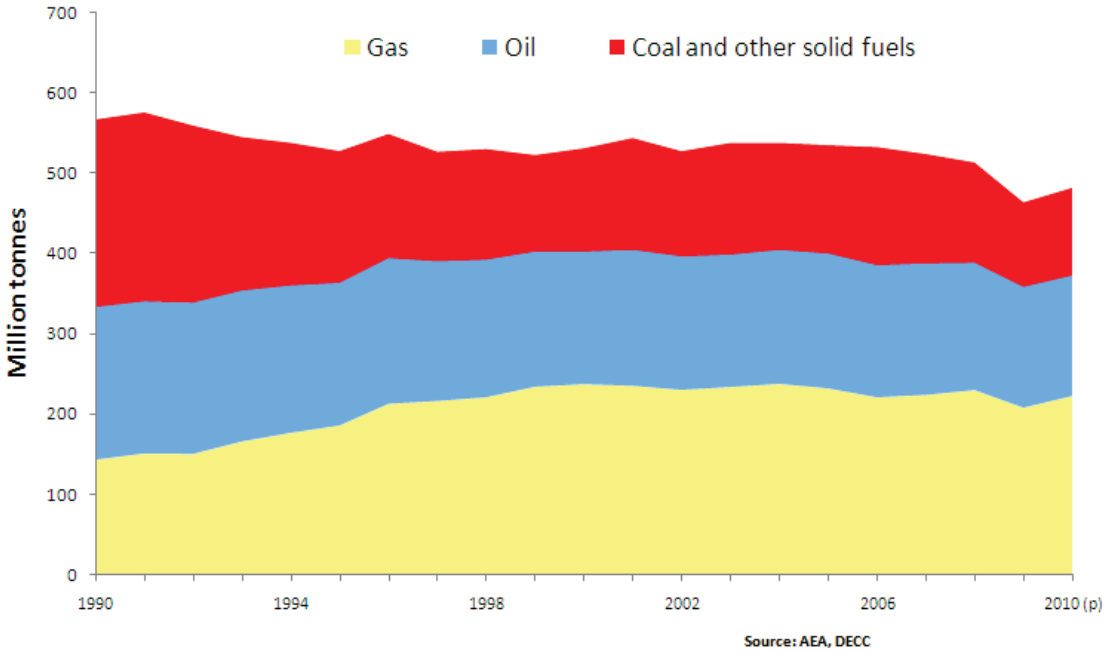
amounted to 434 tonnes per GWh of electricity supplied, compared to 424 tonnes per GWh in 2009.

In 2010, carbon dioxide emissions from the use of fossil fuels, including fuel used for generating electricity, were estimated at 482 Mt. This was 4 per cent higher than the 2009 figure of 464 Mt. The biggest increase was in emissions from the use of gas, up 7 per cent (15 Mt) from 208 Mt in 2009 to 222 Mt in 2010.

Over the period 1990 to 2010, CO_2 emissions from fossil fuels decreased by 15 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 use as a proportion of all fossil fuels has increased from 26 per cent in 1990 to 48 per cent in 2010, whilst the proportion used of coal and other solid fuels has decreased from 34 per cent to 17 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 36 per cent in 2010.

Figure 4 below shows CO_2 emissions by fossil fuel between 1990 and 2010. The time series since 1990 is shown in Table 8 towards the end of this statistical release.

Figure 4: Carbon dioxide emissions by fossil fuels: 1990-2010 (provisional)

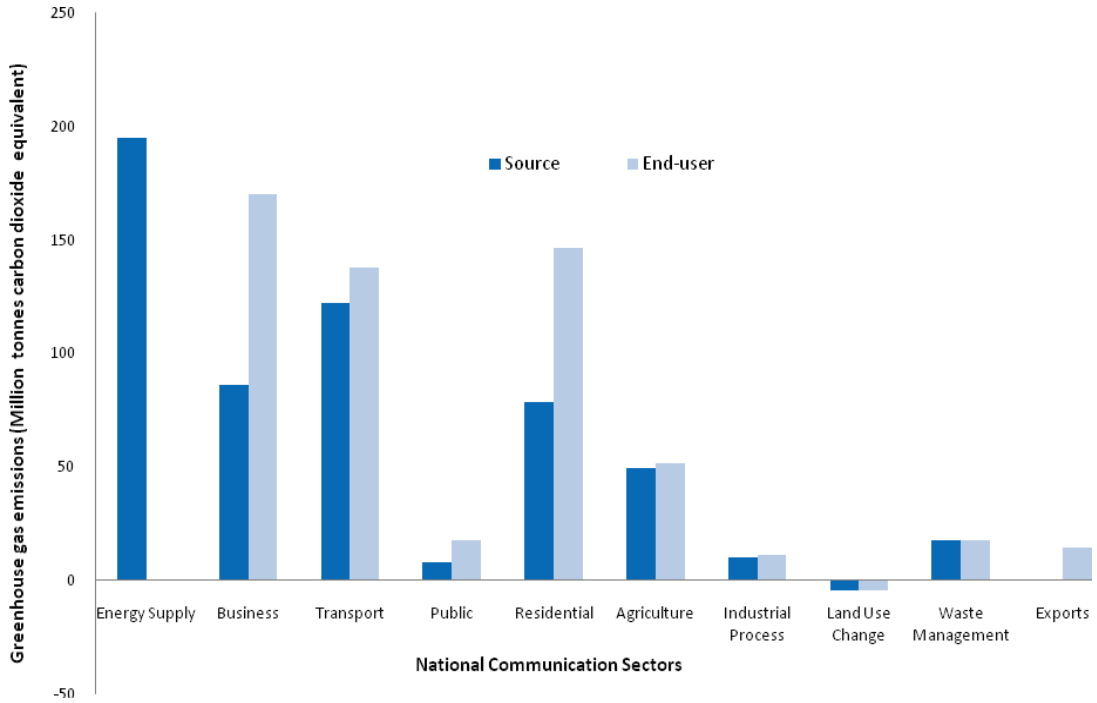


Other results published today:
2009 greenhouse gas emissions by end-user sector

Also published today is the breakdown of 2009 greenhouse gas emissions by end-user. These results are based on, and consistent with, the breakdown of 2009 emissions by source which was published on 1st February 2011. The end-user breakdown reallocates the emissions by source in accordance with where the end-use occurred. The results shown in 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 by source.

The affect across all sectors of reallocating 2009 greenhouse gas emissions from source to end-user is shown in Figure 5 below.

Figure 5: Allocation of 2009 greenhouse gas emissions from source sectors to end-user sectors



A summary of the changes in the end-user breakdown for each gas between 2008 and 2009 can be found in Table 9 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.

The full end-user breakdown by National Communications category, from 1990 to 2009, can be found on the Climate Change Statistics section of the DECC website.

Emissions by gas and end-user sector

Total greenhouse gases

In 2009, three main sectors accounted for 81 per cent of all end-user greenhouse gas emissions; the business sector (30 per cent), the residential

sector (26 per cent), and the transport sector (24 per cent). The largest decreases in end-user emissions between 2008 and 2009 were found in the industrial process, business, residential, and transport sectors (down 34, 14, 8 and 4 per cent respectively).

Since 1990, emissions from all the main sectors have decreased; business by 31 per cent, residential by 14 per cent, and agriculture by 22 per cent. Emissions from the transport sector have only decreased very slightly though, by 1 per cent, over this period.

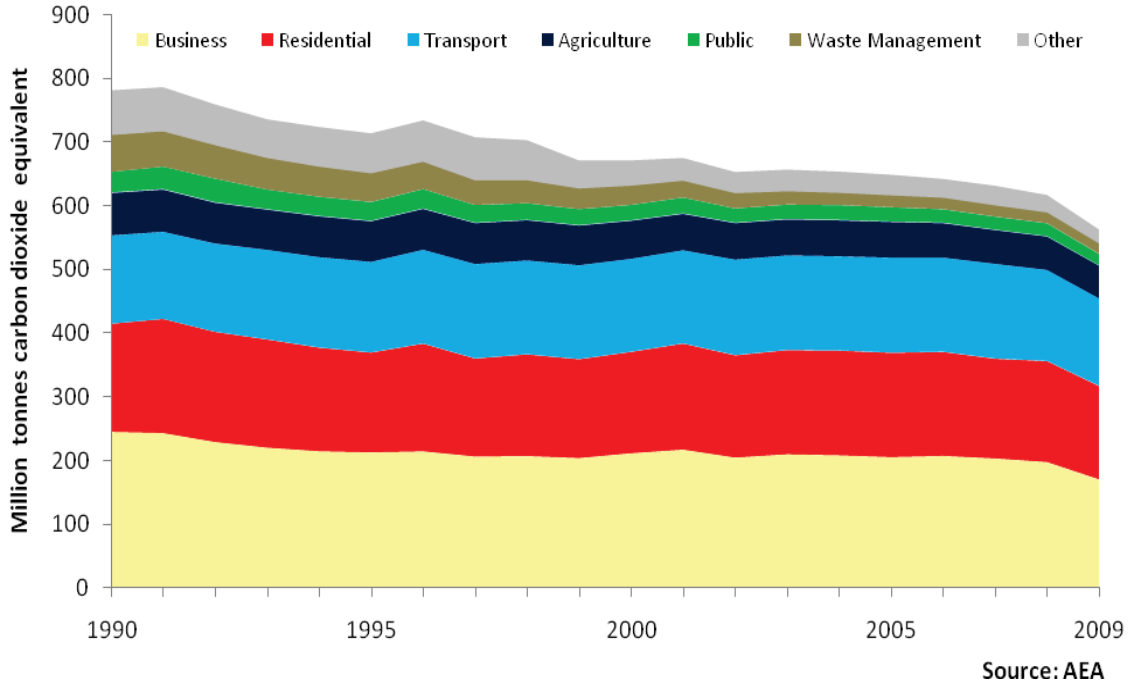
Table 3 and Figure 6 below show the breakdown of greenhouse gas emissions into the main source sectors.

Table 3: Greenhouse gas emissions by end-user, 1990-2009 ($MtCO_2e$)

	1990	1995	2000	2006	2007	2008	2009
Energy Supply	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Business	244.9	212.7	211.2	207.1	203.1	197.4	170.1
Residential	169.8	156.7	159.2	163.4	156.6	158.5	146.5
Transport	139.1	142.8	146.4	148.3	149.2	143.4	137.6
Agriculture	66.8	64.0	60.0	54.3	53.3	52.7	51.9
Waste Management	59.0	46.1	31.5	19.5	19.1	18.5	17.9
Public	31.9	29.2	23.9	20.8	20.1	19.9	17.7
Exports	9.2	13.3	13.0	15.2	15.7	14.2	14.5
Industrial Process	56.9	47.1	26.3	17.5	18.7	17.2	11.4
LULUCF	3.9	2.4	0.4	-3.2	-3.6	-4.0	-4.1
Total	781.6	714.3	672.0	642.9	632.2	617.7	563.6

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

Figure 6: Greenhouse gas emissions by end-user, 1990-2009



Carbon dioxide

Total carbon dioxide (CO_2) emissions in 2009 were 473.7 million tonnes, a decrease of 10 per cent from 2008 (525.1 million tonnes). On an end-user basis, 91 per cent of this total was accounted for by three sectors: business, transport and residential, which represented 33 per cent, 29 per cent and 29 per cent of the total respectively.

Since 2008, there have been large decreases in emissions from the industrial process, business, residential and transport sectors (of 31, 15, 8 and 4 per cent respectively).

Since 1990, there have been notable reductions in emissions from both the business and residential sectors (down 32 and 11 per cent respectively). Emissions from transport were estimated to be around the same level in 2009 as they were in 1990.

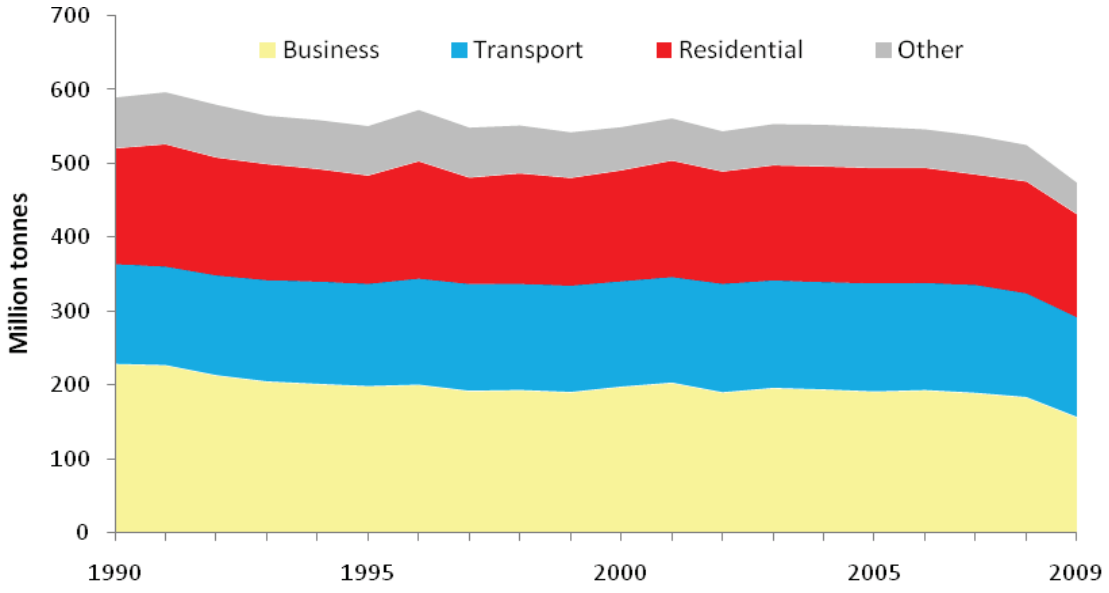
Table 4 and Figure 7 below show the breakdown of carbon dioxide emissions into the main end-user sectors.

Table 4: Carbon dioxide emissions by end-user, 1990-2009 (Mt)

	1990	1995	2000	2005	2006	2007	2008	2009
Business	228	198	198	191	193	189	183	156
Residential	157	146	150	156	156	149	151	140
Transport	136	139	143	147	146	147	141	136
Other	69	67	58	56	52	52	49	42
Grand Total	590	551	549	550	546	538	525	474

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

Figure 7: Carbon dioxide emissions by end-user, 1990-2009



Source: AEA

Methane

Weighted by global warming potential, methane (CH_4) emissions in 2009 totalled 43.6 Mt carbon dioxide equivalent ($MtCO_2e$), a 2 per cent decrease from 2008 (44.5 $MtCO_2e$). On an end-user basis, 37 per cent of these emissions were from landfill waste and 42 per cent from agriculture. Of these two largest contributing sectors, there were decreases in emissions of 3 per cent and 2 per cent respectively between 2008 and 2009.

Since 1990, emissions from landfill waste have reduced by 72 per cent and emissions from agriculture by 20 per cent.

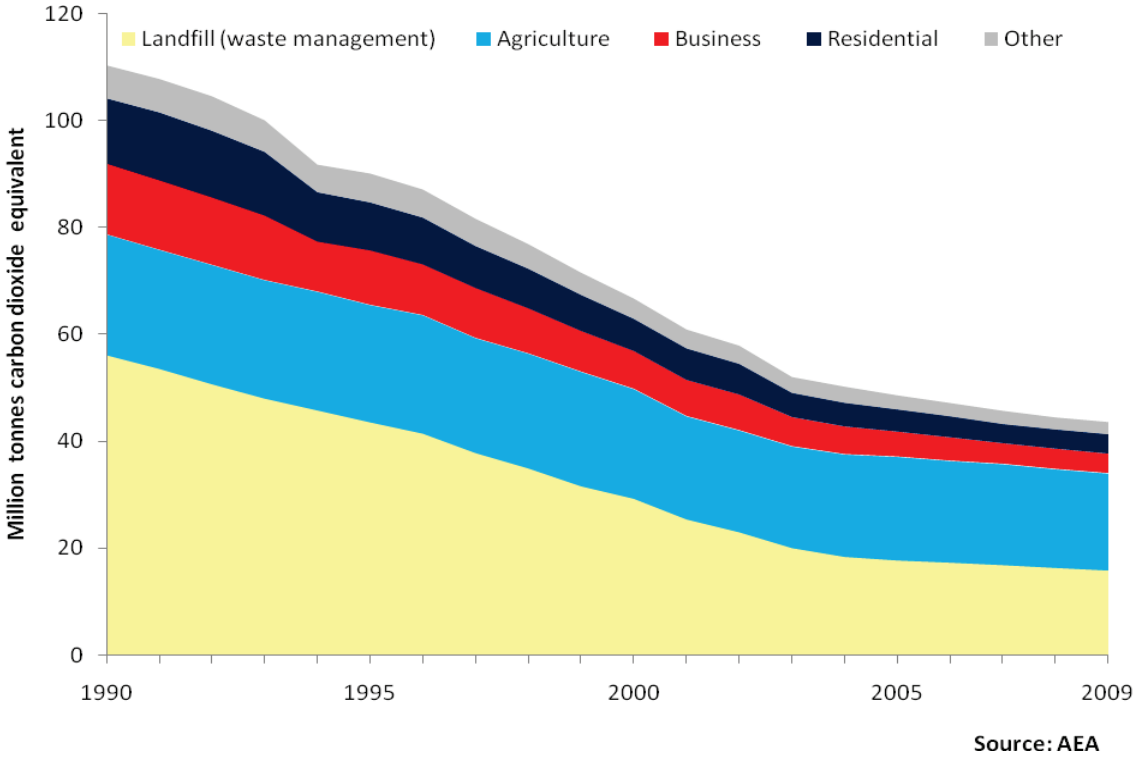
Table 5 and Figure 8 below show the breakdown of methane emissions into the main end-user sectors.

Table 5: Methane emissions by end-user, 1990-2009 ($MtCO_2e$)

	1990	1995	2000	2005	2006	2007	2008	2009
Agriculture	22.5	21.9	20.5	19.3	19.0	18.8	18.4	18.1
Landfill	56.1	43.6	29.3	17.8	17.4	16.9	16.4	15.9
Residential	12.2	9.0	6.1	4.2	4.0	3.7	3.7	3.7
Business	13.3	10.2	7.0	4.6	4.3	3.8	3.7	3.6
Other	6.2	5.4	3.8	2.7	2.5	2.5	2.3	2.3
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.

Figure 8: Methane emissions by end-user, 1990-2009



Nitrous oxide

Weighted by global warming potential, emissions of nitrous oxide (N_2O) were 34.6 $MtCO_2e$ in 2009, a 5 per cent decrease from 2008 (36.4 $MtCO_2e$). On an end-user basis, emissions from agriculture, which accounted for 79 per cent of the total, fell slightly (by 1 per cent) compared with the previous year, although they were 23 per cent lower than in 1990.

Emissions from industrial process, which made up around 4 per cent of the total, were 51 per cent lower than in 2008, and 95 per cent lower than in 1990. This reduction in the industrial process sector is largely due to the effect of adipic acid production, emissions from which fell by 95 per cent between 1998 and 1999 alone.

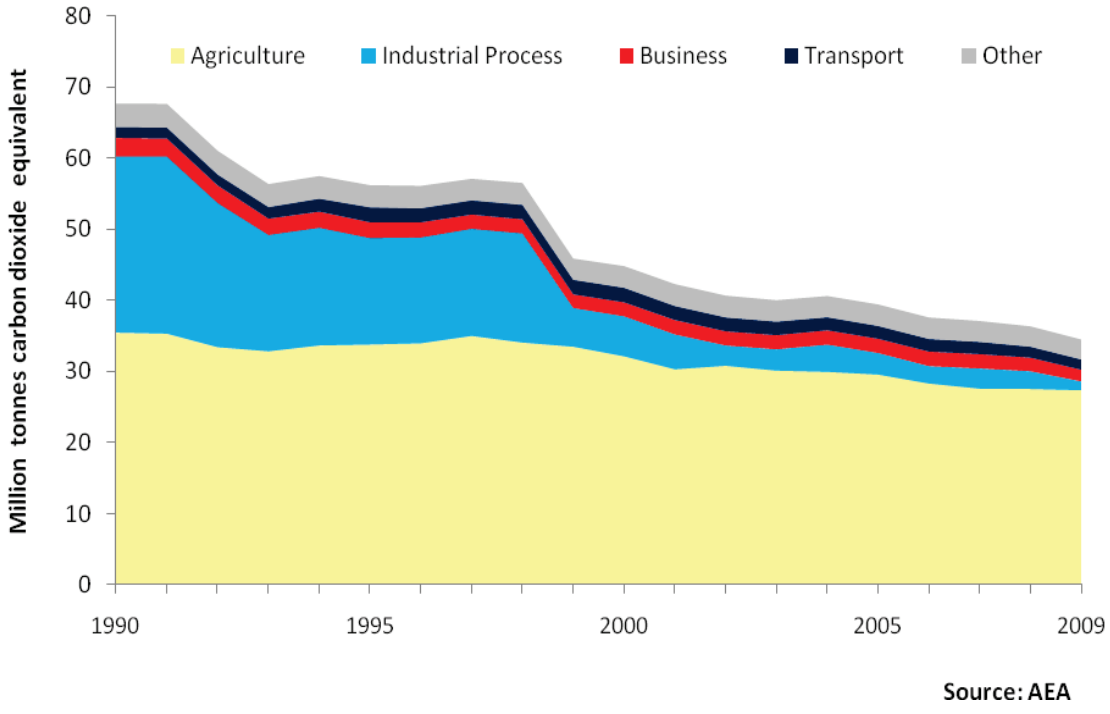
Table 6 and Figure 9 below show the breakdown of nitrous oxide emissions into the main source sectors.

Table 6: Nitrous oxide emissions by end-user, 1990-2009 ($MtCO_2e$)

	1990	1995	2000	2005	2006	2007	2008	2009
Agriculture	35.5	33.8	32.2	29.6	28.4	27.6	27.6	27.4
Business	2.6	2.2	1.9	2.0	2.0	2.0	1.9	1.6
Transport	1.6	2.2	2.1	1.8	1.8	1.8	1.6	1.5
Industrial Process	24.7	14.9	5.6	3.0	2.4	2.8	2.5	1.2
Other	3.3	3.1	3.1	3.0	3.0	3.0	2.9	2.8
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 9: Nitrous oxide emissions by end-user, 1990-2009



Source: AEA

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 2008. Further details of these revisions can be found in the National Statistics release of 1st February 2011, which covered 2009 UK greenhouse gas emissions by source.

UK performance against emissions reduction targets

The UK has a number of targets, both international and domestic, for reducing greenhouse gas emissions. These are essentially the Kyoto Protocol target and the Carbon Budgets set out under the UK Climate Change Act.

In reporting emissions reductions against these targets, the UK is able to take account of emissions trading through the European Union Emissions Trading System (EU ETS).

DECC reported on performance against these targets in detail in the National Statistics release of 1st February 2011, which covered 2009 UK greenhouse gas emissions final figures. Performance was reported so as to take account of the latest available EU ETS results, also covering the 2009 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 2010 emissions estimates – we will not be able to do so until the 2010 EU ETS results become available in May 2011.

Future updates to emissions estimates

Final estimates of UK greenhouse gas emissions for 2010 will be published as National Statistics in early February 2012. These estimates will be based on the UK's National Atmospheric Emissions Inventory for 2010, to be produced for DECC and the Devolved Administrations by 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

Contact telephone: 0300 068 5583

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. The figures for 1990 to 2009 in this statistics release are from the National Atmospheric Emissions Inventory (NAEI), produced for DECC and the Devolved Administrations by 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.

2. The climate change indicator is one of the 68 indicators supporting the Government's Sustainable Development Strategy.

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 2010 estimates are subject to a greater range of uncertainty than the final figures for earlier years. For more information on these uncertainties see the Climate Change Statistics section of the DECC website.

4. Further details of the European Union Emissions Trading System can be found at the EU ETS section of the DECC website.

5. Detailed UK temperature data can be found on both the Met Office website and the Energy Statistics section of the DECC website.

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A National Statistics publication

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Table 7: UK Greenhouse Gas Emissions 1990-2010 (provisional), headline results

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	2010(p)
Net CO_2 emissions (emissions minus removals)	Energy supply	241.2	209.6	201.8	212.4	209.5	216.8	215.1	216.1	219.9	215.9	209.4	185.3	191.3
	Business	109.8	103.9	104.1	104.2	93.9	95.6	93.6	93.8	91.3	89.2	87.4	75.9	77.7
	Transport	120.0	120.2	125.2	125.3	127.9	127.5	128.8	129.3	129.6	130.7	126.0	120.8	120.6
	Public	14.0	13.6	11.7	12.1	10.3	10.1	11.1	11.0	10.0	9.3	9.3	8.2	8.6
	Residential	79.0	80.8	87.0	89.3	86.1	86.9	88.4	84.3	81.7	78.1	79.9	75.2	85.3
	Agriculture	5.2	5.3	4.8	4.8	4.8	4.8	4.6	4.5	4.3	4.1	4.1	4.1	4.1
	Industrial process	16.2	14.9	14.7	13.4	12.5	13.4	13.8	14.0	13.2	14.5	13.4	8.8	8.6
	Waste Management	1.2	0.9	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3
	LULUCF	3.1	1.6	-0.4	-0.9	-1.8	-2.1	-3.2	-3.7	-3.9	-4.3	-4.7	-4.8	-4.8
	Total CO_2	589.7	550.8	549.4	561.3	543.7	553.4	552.6	549.7	546.3	537.8	525.1	473.7	491.7
Other greenhouse gases	Total	191.9	163.5	122.6	114.5	110.0	104.1	101.8	99.7	96.6	94.4	92.6	89.9	88.0
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	582.4

Notes

1. Figures shown for 2010 are provisional.
2. Provisional 2010 CO_2 emissions for the agriculture, waste and LULUCF sectors have not been estimated; 2009 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 8: UK Carbon Dioxide Emissions by fuel, 1990-2010 (provisional)

Million tonnes carbon dioxide

	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010(p)
Gas	143.0	185.6	237.1	235.0	229.9	233.5	237.3	231.7	220.7	223.7	229.6	207.7	222.3
Oil	190.7	178.2	165.6	169.9	167.0	165.4	167.4	168.7	165.3	164.4	159.2	151.0	150.6
Coal	217.7	151.4	116.7	129.0	120.5	129.7	124.4	124.7	136.5	126.0	115.4	96.3	100.5
Other solid fuels	15.6	12.5	11.7	10.0	10.2	9.3	8.8	10.0	10.2	9.8	9.2	8.8	8.4
Non-fuel	22.6	23.1	18.3	17.3	16.1	15.6	14.6	14.7	13.7	13.8	11.6	9.9	9.8
Total	589.7	550.8	549.4	561.3	543.7	553.4	552.6	549.7	546.3	537.8	525.1	473.7	491.7

Notes

1. Figures shown for 2010 are provisional.

Table 9: UK emissions of all greenhouse gases, carbon dioxide, methane and nitrous oxide, 2008-09, by source and end-user, National Communication categories

		Source			End User		
Greenhouse Gas	**NC Category**	**2008**	**2009**	**% change**	**2008**	**2009**	**% change**
All Greenhouse gases (million tonnes carbon dioxide equivalent)	Energy Supply	219.2	195.0	-11.0	-	-	-
	Business	97.4	85.9	-11.8	197.4	170.1	-13.8
	Transport	127.6	122.2	-4.2	143.4	137.6	-4.0
	Public	9.3	8.2	-12.3	19.9	17.7	-11.0
	Residential	83.4	78.6	-5.8	158.5	146.5	-7.6
	Agriculture	50.0	49.5	-1.1	52.7	51.9	-1.6
	Industrial Process	16.4	10.4	-36.5	17.2	11.4	-33.5
	Land Use Change	-4.0	-4.1	2.9	-4.0	-4.1	2.9
	Waste Management	18.5	17.9	-2.7	18.5	17.9	-2.7
	Exports	-	-	-	14.2	14.5	2.5
	Total	**617.7**	**563.6**	**-8.8**	**617.7**	**563.6**	**-8.8**
Carbon dioxide (million tonnes)	Energy Supply	209.4	185.3	-11.5	-	-	-
	Business	87.4	75.9	-13.1	183.3	156.2	-14.8
	Transport	126.0	120.8	-4.2	141.2	135.5	-4.0
	Public	9.3	8.2	-12.3	19.4	17.2	-11.2
	Residential	79.9	75.2	-5.9	151.4	139.5	-7.9
	Agriculture	4.1	4.1	-1.1	6.7	6.3	-5.4
	Industrial Process	13.4	8.8	-34.4	13.9	9.5	-31.5
	Land Use Change	-4.7	-4.8	2.1	-4.7	-4.8	2.1
	Waste Management	0.3	0.3	-0.5	0.3	0.3	-0.5
	Exports	-	-	-	13.6	13.9	2.1
	Total	**525.1**	**473.7**	**-9.8**	**525.1**	**473.7**	**-9.8**
Methane (thousand tonnes)	Energy Supply	395.4	399.2	1.0	-	-	-
	Business	12.8	10.9	-15.0	177.1	170.1	-3.9
	Transport	6.5	4.6	-29.4	28.2	28.8	2.3
	Public	0.9	0.8	-13.0	21.3	21.2	-0.7
	Residential	22.7	21.6	-4.7	174.0	176.5	1.4
	Agriculture	872.7	858.4	-1.6	876.0	861.7	-1.6
	Industrial Process	5.8	5.0	-15.1	20.1	19.0	-5.5
	Land Use Change	1.7	1.4	-15.9	1.7	1.4	-15.9
	Waste Management	798.2	773.9	-3.0	798.2	773.9	-3.0
	Exports	-	-	-	20.1	23.0	14.5
	Total	**2116.7**	**2075.7**	**-1.9**	**2116.7**	**2075.7**	**-1.9**
Nitrous oxide (thousand tonnes)	Energy Supply	4.8	4.4	-9.5	-	-	-
	Business	4.1	3.5	-13.1	6.0	5.2	-14.0
	Transport	4.5	4.2	-7.0	5.1	4.8	-6.0
	Public	0.0	0.0	-3.9	0.2	0.2	-9.7
	Residential	0.4	0.4	-2.0	1.9	1.7	-8.2
	Agriculture	89.0	88.4	-0.7	89.0	88.4	-0.7
	Industrial Process	8.0	3.9	-50.7	8.0	3.9	-50.6
	Land Use Change	2.1	2.1	-2.0	2.1	2.1	-2.0
	Waste Management	4.5	4.6	0.5	4.5	4.6	0.5
	Exports	-	-	-	0.5	0.5	3.1
	Total	**117.5**	**111.5**	**-5.1**	**117.5**	**111.5**	**-5.1**