Office for National Statistics

Statistical Bulletin

Greenhouse gas emissions intensity falls in 2007

Environmental Accounts 2009

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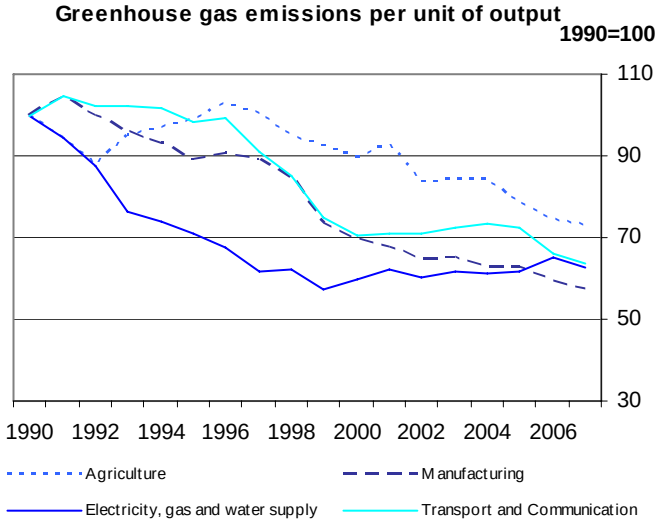
The level of greenhouse gas emissions[1] created per unit of output[2] (emissions intensity) by the UK economy (excluding households) fell 4.4 per cent between 2006 and 2007.

Emissions intensity in the electricity, gas and water supply industry decreased 3.0 per cent in 2007 with emissions falling despite growth in the sector. This mainly reflects the continuing switch away from coal to other forms of electricity generation such as the combustion of natural gas. Emissions intensity fell by 3.7 per cent in transport and communications, 2.7 per cent in manufacturing and 2.1 per cent in agriculture.



These four industry sectors accounted for over 80 per cent of the emissions of greenhouse gases by the UK economy (excluding households) in 2007 and represented approximately one quarter of economic output[2].

Much of the period 1990 to 2007 has seen strong economic growth in the UK. Allowing for this growth, there have been substantial improvements in emissions intensity across the non-household sector with levels of emissions per unit of output in 2007 46.9 per cent below those in 1990. Greenhouse gas emissions per unit of output over this period fell 37.1 per cent in electricity, gas and water supply, 42.5 per cent in manufacturing, 36.5 per cent in transport and communications and 27.1 per cent in agriculture. Overall, falls in emissions intensity have more than offset growth so overall emissions dropped.

[1] The ONS Environmental Accounts measure greenhouse gas emissions on a UK residents basis. See note 6.

[2] Output is based on calculations using the chained volume measure of Gross Value Added, the contribution of individual industries to Gross Domestic Product.

Also updated in the Environmental Accounts are energy consumption, environmental taxes and general waste arisings.

Energy consumption (Tables A and B)
In 2007, total energy consumption, including nuclear and hydroelectric power and imports of electricity, fell 2.8 per cent from 236.0 million tonnes of oil equivalent (mtoes) a year earlier to 229.4 mtoes. Since 1990, total energy consumption has risen 4.7 per cent.

Between 1990 and 2007, the consumption of fossil fuels rose 6.3 per cent while greenhouse gas emissions fell 12.6 per cent. This was due to changes in fuel use - the combustion of natural gas rather than coal - and the introduction of integrated pollution prevention and control measures.

The use of fossil fuels such as coal, oil and gas fell from 217.4 mtoes in 2006 to 214.0 mtoes in 2007, a decrease of 1.6 per cent on the previous year. The largest direct users of fossil fuels were the electricity, gas and water supply industries which accounted for 28.7 per cent of fossil fuel consumption in 2007, consuming 61.5 mtoes, up 0.3 per cent on 2006.

The next largest consumer was the UK household sector (26.9 per cent) which consumed 57.6 mtoes in 2007. This was 3.0 per cent lower than in 2006 and together with a fall in the manufacturing sector (3.7 per cent) helped to drive energy use down in 2007.

Energy from other sources such as nuclear power, hydroelectric power, and imported electricity fell by 16.8 per cent between 2006 and 2007, for the first time falling below 1990 levels. Generation from nuclear sources fell due to a high level of outages for repairs and maintenance and the closure of two Magnox stations.

The total amount of energy derived from renewable sources rose 8.1 per cent between 2006 and 2007 with 1.7 per cent of all UK energy in 2007 coming from renewable sources.

Atmospheric emissions (Tables C, D and E)

Greenhouse gas emissions
Greenhouse gas emissions, on a UK residents basis, fell 1.7 per cent between 2006 and 2007 to 707.1 million tonnes of carbon dioxide (CO_2) equivalent. Greenhouse gas emissions in 2007 were down 12.6 per cent compared with the Kyoto base year of 1990.

Household sector
Emissions from the household sector reduced by 2.6 per cent (4.1 million tonnes of CO_2 equivalent) in 2007. These were almost wholly reductions in carbon dioxide emissions, with a 4.2

per cent (3.6 million tonnes of CO_2 equivalent) reduction in greenhouse gas emissions from domestic heating and a 0.7 per cent reduction in travel related emissions. Emissions from the household sector (which accounts for approximately one fifth of total greenhouse gas emissions) have increased 6.3 per cent since 1990 but the trend has started to reverse in the last three years.

UK companies and public sector

Between 2006 and 2007, greenhouse gas emissions from UK companies and the public sector decreased by 7.9 million tonnes of CO_2 equivalent (1.4 per cent) to 555.9 million tonnes of CO_2 equivalent. The largest reductions were in carbon dioxide (5.2 million tonnes) and methane (1.5 million tonnes CO_2 equivalent).

Fuel combustion is the main source of carbon dioxide emissions and there were falls in the electricity, gas and water supply sector (-3.6 million tonnes, -1.9 per cent), manufacturing (-2.4 million tonnes, -2.3 per cent) and transport and communications (-0.7 million tonnes, -0.7 per cent)

The methane reductions were predominantly in mining and quarrying (-0.9 million tonnes, -19.3 per cent), agriculture (0.4 million tonnes, -1.9 per cent) and energy, gas and water supply (0.2 million tonnes, 4.3 per cent). Emissions from these sources have been declining since 1990 due to reduced coal mining activity, improvements to the gas distribution network and decreasing livestock numbers. A significant factor in the 1990s was also the implementation of methane recovery systems in the waste sector.

Between 1990 and 2007, greenhouse gas emissions from UK companies and the public sector fell 16.7 per cent. The largest falls were in manufacturing (63.8 million tonnes of CO_2 equivalent, 36.8 per cent), other services (30.5 million tonnes of CO_2 equivalent, 52.3 per cent) and electricity, gas and water supply (21.1 million tonnes of CO_2 equivalent, 9.7 per cent). Over the same period, the largest increase in emissions came from the transport and communications sector (28.0 million tonnes of CO_2 equivalent, 43.6 per cent).

The reductions in manufacturing were mainly in carbon dioxide (29.9 million tonnes CO_2 equivalent) and nitrous oxide emissions (22.2 million tonnes of CO_2 equivalent). The reduction in nitrous oxide emissions reflects mainly plant closures in the organic base chemicals industry and the installation of emissions abatement equipment at nitric acid plants in 1998. The reductions in carbon dioxide have occurred more steadily over the 17 years.

The reduction in other services almost wholly reflects the reduction in methane emissions from the waste industry due to the implementation of methane recovery systems in the sector. There was a reduction of 58.8 per cent in the period up to 2004, after which the time series has been fairly flat.

The increase in the transport and communications sector is driven mainly by emissions from UK owned air transport operating domestically and between the UK and the rest of the world, with greenhouse emissions more than doubling since 1990 to represent 6.2 per cent of all UK greenhouse gas emissions in 2007.

Overall, most of the reduction in greenhouse gas emissions since 1990 has occurred in the period between 1990 and 1999, with 10.1 per cent of the 12.6 per cent decrease occurring in those years.

Acid rain precursors

Since 1990, total emissions of the chemicals that cause acid rain have fallen by 61.2 per cent. Over this period there have been reductions in all industries. In 2007, the transport and communications sector represented the largest contributor of these emissions at 26.9 per cent of the total, the next largest contributor was the electricity, gas and water supply industry at 20.6 per cent followed by the agricultural sector at 19.3 per cent. In 2007 emissions from households (which account for 8.0 per cent of emissions) were 67.1 per cent lower than in 1990 mainly reflecting falling emissions from the use of vehicles as a result of cleaner technology.

Environmental taxes (Table F)

In 2008, environmental tax receipts amounted to £38.5 billion, an increase of £0.5 billion (1.4 per cent) compared with the previous year. Environmental taxes were 2.7 per cent as a percentage of Gross Domestic Product (GDP) in 2008. The percentage increased steadily from 3.0 per cent in 1993 to 3.5 per cent in 1999 before the trend reversed, with growth in the economy outstripping revenues from environmental taxes.

Background Notes

Basic quality information

1. Key Issues specific to this release

Energy consumption - For the first time, this publication includes a bridging table (B) to present, in a transparent way, the differences between the energy statistics presented by the Department for Energy and Climate Change (DECC) in the Digest of UK Energy Statistics (DUKES) and the National Accounts measure presented in table A.

2006 statistics on general waste arisings already published by Defra are also included for the first time in the Environmental Accounts publication today. http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=3698&Pos=6&ColRank=1&Rank=272

For general issues regarding the interpreting of the series, please see the 'Common pitfalls in interpreting the series' section below.

2. Link to Summary Quality Report

Summary Quality Reports for air emissions, energy consumption and environmental taxes can be found at http://www.ons.gov.uk/about-statistics/methodology-and-quality/quality/qual-info-economic-social-and-bus-stats/quality-reports-for-economic-statistics/index.html. These reports describe, in detail, the intended uses of the statistics presented in this publication, their general quality and the methods used to produce them.

Relevance to users

3. Environmental accounts provide data on the environmental impact of UK economic activity, on the use of resources from the environment in the economy, and on associated taxes and subsidies. There are three dimensions:

- Natural resource accounts
- Physical flow accounts
- Monetary accounts

The environmental accounts are used to inform sustainable development policy, to model impacts of fiscal or monetary measures and to evaluate the environmental performance of different industrial sectors.

4. The Environmental Accounts are 'satellite accounts' to the main National Accounts. They provide information on atmospheric emissions, energy consumption, oil and gas reserves, trade in basic materials, environmental taxation and spending on environmental protection. These are related to the different industrial, commercial and domestic sectors. Environmental Accounts use similar concepts and classifications of industries to those employed in the National Accounts, and they reflect the recommended European Union and United Nations framework for developing such accounts. The Environmental Accounts are compiled in accordance with System of Integrated Environmental and Economic Accounting 2003 (SEEA) which closely follows the UN System of National Accounts 1993 (SNA).

5. The maximum resolution of industrial disaggregation is 93 industries for the atmospheric emissions and energy consumption statistics. There is a direct correspondence between the Environmental Accounts industry classifications and the system of Standard Industrial Classification 1992 (SIC92). It is planned to dispense with the Environmental Accounts system of coding with the introduction of SIC2007. In the meantime, a look-up table is provided as an annex to the publication.

Common pitfalls in interpreting series

Coherence with other published sources of energy and greenhouse gas emissions

6. To facilitate environmental-economic analyses (for example, examining trends in emissions within the context of economic growth) the Environmental Accounts estimates for atmospheric emissions are published on a National Accounts basis. The definitions therefore differ from those used for reporting under the Kyoto Protocol and United Nations Framework Convention on Climate Change (UNFCCC). The National Accounts measure includes emissions from international aviation and from fuels purchased abroad by UK residents, including those purchased by international shipping and aircraft on international flights. They exclude emissions from fuels purchased in the UK by non-UK residents. Differences between the National Accounts measure and those used for reporting under the United Nations Framework Convention on Climate Change, following the guidance of the Intergovernmental Panel on Climate Change (IPCC), are shown in table E.

7. Similarly, the National Accounts measures of energy consumption presented in table A differ from those given in the Digest of UK Energy Statistics (DUKES) in a number of respects. Table B provides a transparent presentation of these differences and how the measures reconcile.

Industry classifications

8. The UK transport sector, as defined on an SIC basis, comprise those enterprises whose dominant activity is the provision of transport services - railways, tubes and trams, buses and coaches, taxis and mini cabs, road freight, air transport, water transport and transport via pipelines. The road freight industry covers road haulage companies as opposed to all types of road freight. Lorries owned by retailers, for instance, are allocated to the retail industry. The use of private cars by households is allocated to the domestic sector.

Accuracy and reliability

9. ONS atmospheric emissions and energy consumption data are produced by contractors (AEA Energy and Environment) based on the National Atmospheric Emissions and Greenhouse Gas Emissions Inventories (NAEI, GHGI) and the latest available National Accounts and official statistics sources, for example, supply-use tables. Other elements of the environmental accounts also draw on National Accounts data and administrative sources. Factors impacting the accuracy of the Environmental Accounts include the allocation of emissions to industries and the accuracy of emissions factors. No work has been done at this time to assess the impact of these factors but a continuous development programme is in place to support the Environmental Accounts, implemented by both the contractors and ONS.

10. Reliability can be estimated by measuring revisions to previously published statistics. Very few statistical revisions arise as a result of 'errors' in the popular sense of the word. All estimates, by definition, are subject to statistical 'error' but, in this context, the word refers to the uncertainty in any process or calculation that uses sampling, estimation or modelling. Most revisions reflect either the adoption of new methodology or the incorporation of new information. Only rarely are there avoidable 'errors' such as human or system 'errors' and such mistakes are made clear when they are discovered and corrected.

Revisions to greenhouse gas emissions, percentage change when compared with 2009 publication					
%	**1990**	**1995**	**2000**	**2005**	**2006**
Autumn 2008	**0.1**	**0.4**	**0.1**	**-0.5**	**-0.7**

Revisions to energy consumption, direct use of energy, percentage change when compared with 2009 publication					
%	**1990**	**1995**	**2000**	**2005**	**2006**
Autumn 2008	**-1.0**	**-1.2**	**-1.2**	**-1.5**	**-1.5**

Revisions to total environmental taxes, percentage change when compared with 2009 publication					
%	1990	1995	2000	2005	2006
Autumn 2008	-	-	-	-	-

11. The reasons for the revisions are as follows:

Greenhouse gas emissions and electricity consumption - In 2006 there was a downward revision to electricity consumption of 3.6 million tonnes of oil equivalent (1.5 per cent) and to greenhouse gas emissions of 5.4 million tonnes CO2 equivalent (0.7 per cent).

The revisions were mainly to emissions from road transport which affect the whole time series for all industries but primarily the transport and communications sector (-3.4 million tonnes CO2 equivalent) and the households (+3.6 million tonnes CO2 equivalent). The revisions are due to a major methodology change resulting in the reallocation of emissions within the road transport sector. Changes include the review of speed data for different road and area types, vehicle km data and fleet composition data. Also notable in 2006 (and also affecting 2005) was the 1.7 million tonnes CO2 equivalent downward revision to the electricity, gas and water supply sector due to new data on fossil fuels use by power stations, autogenerators and refineries.

Notes on tables

12. Rounding The sum of constituent items in tables may not always agree exactly with the totals shown due to rounding.

13. Symbols

†	Indicates earliest revision.
-	Nil or less than half the final digit shown.

Publication policy

14. This statistical bulletin provides a snapshot of the key Environmental Accounts statistics updated today. The full Environmental Accounts 2009 publication is also released on-line today and can be accessed via the Focus on Environmental Accounts. http://www.statistics.gov.uk/focuson/environmental/

15. The complete run of data in the tables of this Statistical Bulletin, together with more detailed industry datasets, is also available to view and download in other electronic formats free of charge from the National Statistics website.

http://www.statistics.gov.uk/statbase/explorer.asp?CTG=3&SL=&D=4261&DCT=32&DT=32#4261

16. Details of the policy governing the release of new data are available from the press office. Also available is a list of the names of those given pre-publication access to the contents of this release.

17. National Statistics are produced to high professional standards set out in the Code of Practice for Official Statistics. They undergo regular quality assurance reviews to ensure that they meet customer needs. They are produced free from political interference.

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A Energy Consumption

Million tonnes of oil equivalent

		1990	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Direct use of energy from fossil fuels														
Agriculture	JKPO	2.3	2.5†	2.4	2.3	2.3	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.0
Mining and quarrying	JKPP	4.7	6.2	6.4†	6.8	6.7	6.9	8.0	7.8	7.9	7.8	7.6	7.3	7.0
Manufacturing	JKPQ	41.4†	41.5†	41.5	40.7	40.6	40.2	39.0	36.9	37.3	36.5	37.1	35.3	34.0
Electricity, gas and water supply	JKPR	56.6†	51.9†	49.3	51.4	51.2	54.9	57.2	56.2	58.5	59.1	59.4	61.3	61.5
Construction	JKPS	2.8†	3.2†	3.2	3.2	3.2	3.1	3.1	3.2	3.2	3.3	3.5	3.4	3.5
Wholesale and retail trade	JKPT	5.5	6.2†	6.0	6.2	6.5	6.5	6.1	5.8	6.0	6.2	6.0	5.8	6.0
Transport and communication	JKPU	21.9†	25.9†	26.4	27.7	27.6	28.6	30.0	30.1	31.1	32.8	33.8	31.6	31.4
Other business services	JKPV	2.6	3.0†	2.8	2.8	2.9	2.9	3.0	2.5	2.6	2.5	2.6	2.5	2.5
Public administration	JKPW	3.8	4.0	3.9	3.6	3.5	3.3	3.5	3.6	3.4	3.4†	3.4	3.3	3.4
Education, health and social work	JKPX	4.0	4.3	4.4	4.3	4.4	4.3†	4.3	3.5	3.6	3.9	3.8	3.7	3.5
Other services	JKPY	1.9†	2.0†	1.9	1.9	1.9	1.9	2.0	1.7	1.8	1.8	1.8	1.8	1.7
Total non-household	IGJ9	147.5†	150.6†	148.2	150.9	150.8	154.8	158.4	153.6	157.6	159.5	160.8	158.0	156.4
Households	JKPZ	53.9	61.0†	58.3	59.1	59.4	59.9	61.4	61.1	61.4	62.7	61.0	59.4	57.6
Total use of energy from fossil fuels	JKQA	**201.4†**	**211.6†**	**206.4**	**210.0**	**210.1**	**214.8**	**219.8**	**214.7**	**219.0**	**222.2**	**221.8**	**217.4**	**214.0**
Energy from other sources[1]	JKQB	17.7	24.0	23.8	25.0	24.0	21.4	22.1	21.3	20.6	19.4	19.8	18.5	15.4
Total energy consumption of primary fuels and equivalents	JKQC	**219.1†**	**235.5†**	**230.3**	**235.0**	**234.1**	**236.2**	**241.9**	**236.0**	**239.6**	**241.6**	**241.6**	**236.0**	**229.4**
Direct use of energy including electricity														
Agriculture	JKQD	2.7†	2.8†	2.7	2.7	2.7	2.6	2.5	2.5	2.6	2.5	2.5	2.4	2.3
Mining and quarrying	JKQE	4.9	6.4	6.5	7.0	6.9	7.1	8.2	8.0	8.1	8.0	7.8	7.6	7.2
Manufacturing	JKQF	48.8†	49.1†	48.9	48.0	48.1	47.5	46.0	44.4	44.9	44.0	44.5	42.8	41.4
Electricity, gas and water supply	JKQG	51.4†	50.8†	48.2	51.3	49.7	50.6	53.3	51.3	52.4	52.0	52.3	53.0	50.5
of which - transformation losses by major producers	JKQH	46.5	45.2	44.0	45.3	43.7	44.0	46.3	44.9	46.4	45.6	46.6†	47.4	44.8
distribution losses of electricity supply	JKQI	2.1	2.4	2.5	2.4	2.4	2.5	2.7	2.6	2.6	2.6	2.4†	2.4	2.3
Construction	JKQJ	2.9†	3.3†	3.3	3.3	3.3	3.3	3.3	3.3	3.4	3.5	3.6	3.6	3.7
Wholesale and retail trade	JKQK	7.4	8.6	8.6†	8.7	9.1	9.2	8.9	8.7	8.9	9.2	9.0	8.8	9.0
Transport and communication	JKQL	22.5†	26.9†	27.4	28.7	28.6	29.6	31.0	31.1	32.3	33.8	35.0	32.7	32.5
Other business services	JKQM	4.4†	4.9†	4.8	4.9	5.1	5.2	5.4	4.9	5.0	4.8	4.9	4.8	4.8
Public administration	JKQN	4.7	4.5	4.3	3.9	3.8	3.6	3.8	3.8	3.7	3.7†	3.6	3.6	3.6
Education, health and social work	JKQO	5.1	5.6	5.6	5.6	5.6†	5.5	5.6	4.7	4.7	5.0	4.8	4.9	4.6
Other services	JKQP	2.4†	2.5†	2.5	2.4	2.4	2.4	2.5	2.3	2.4	2.3	2.3	2.4	2.3
Total non-household	IGK2	157.2†	165.3†	163.0	166.5	165.2	166.6	170.6	165.1	168.2	168.9	170.5	166.5	161.9
Households	JKQQ	62.0†	70.2†	67.2	68.5	68.8	69.6	71.3	71.0	71.4	72.6	71.1	69.4	67.5
Total energy consumption of primary fuels and equivalents	JKQR	**219.1†**	**235.5†**	**230.3**	**235.0**	**234.1**	**236.2**	**241.9**	**236.0**	**239.6**	**241.6**	**241.6**	**236.0**	**229.4**
Reallocated use of energy														
Energy industry electricity tranformation losses and distribution losses and allocated to final consumer														
Agriculture	JKQS	3.3	3.4†	3.3	3.3	3.3	3.2	3.1	3.1	3.2	3.1	3.1	3.1	2.9
Mining and quarying	JKQT	5.2	6.7	6.8	7.3	7.1	7.5	8.5	8.3	8.4	8.4	8.3	8.0†	7.7
Manufacturing	JKQU	63.2†	62.3†	61.7	61.0	60.6	59.7	58.2	56.9	58.1	56.4	57.1	55.5	53.4
Electricity, gas and water supply	JKQV	6.7†	6.8†	5.2	7.1	7.2	7.7	8.5	7.6	6.6	7.5	7.3	7.5	7.4
Construction	JKQW	3.1†	3.6†	3.6	3.6	3.5	3.5	3.5	3.6	3.6	3.7	3.9	3.8	3.9
Wholesale and retail trade	JKQX	11.2	12.7	13.1†	13.2	13.5	13.8	13.8	13.6	13.9	14.3	14.2	14.0	14.0
Transport and communication	JKQY	23.7†	28.6†	29.1	30.4	30.2	31.2	32.9	32.8	34.2	35.7	37.0	34.6	34.3
Other business services	JKQZ	7.7	8.2	8.4	8.6	8.8	9.2†	9.5	8.8	9.0	8.7	8.8	8.8	8.6
Public administration	JKRA	6.4†	5.4	5.1	4.5	4.2	4.1	4.3	4.1	4.3	4.2†	4.1	4.0	3.9
Education, health and social work	JKRB	7.3	7.9	7.8	7.9	7.8	7.5†	7.7	6.7	6.5	6.8	6.7	6.8	6.5
Other services	JKRC	3.4†	3.5†	3.4	3.3	3.2	3.2	3.4	3.2	3.4	3.3	3.3	3.3	3.2
Total non-household	IGK3	141.4†	149.0†	147.6	150.0	149.4	150.5	153.5	148.7	151.2	152.2	153.6	149.6	145.8
Households	JKRD	77.7	86.5†	82.7	85.1	84.7	85.6	88.4	87.4	88.4	89.4	88.0	86.4	83.6
Total energy consumption of primary fuels and equivalents	JKRE	**219.1†**	**235.5†**	**230.3**	**235.0**	**234.1**	**236.2**	**241.9**	**236.0**	**239.6**	**241.6**	**241.6**	**236.0**	**229.4**
Energy from renewable sources[2]	JKRF	1.8†	2.3†	2.3	2.5	2.7	2.7	2.7	2.9	3.0	3.4	3.5	3.7	4.0
Percentage from renewable sources	JKRG	0.8†	1.0	1.0	1.1	1.1†	1.1	1.1	1.2	1.3	1.4	1.4	1.6	1.7

1 Nuclear power, hydroelectric power and imports of electricty.

2 Renewable sources include solar power and energy from wind, wave and tide, hydroelectricity, wood, straw and sewage gas. Landfill gas and municipal solid waste combustion have also been included within this definition.

Source: AEA Energy & Environment, DECC, ONS

B Energy consumption bridging table National Accounts measure to DUKES [1] measure

Million tonnes of oil equivalent

		2006	2007
Total use of energy from fossil fuels			
National Accounts Measure	JKQA	217.4†	214.0
less			
Cross boundary energy[2]	J96L	5.8	5.6
Marine bunkers[3]	J96M	2.5	2.5
Fuels not included in DUKES energy balances [4]	J96N	1.1	0.9
plus			
Crown Dependencies fuel use[5]	JHC5	0.4	0.5
Transformed energy[6]	J96P	5.9	5.8
Energy in benzoles and tars [7]	J96Q	0.2	0.2
Non energy use[8]	J96R	5.8	5.4
Additional energy included in DUKES [9]	J96S	–	–
Losses [10]	J96T	1.0	1.0
Conversion factor differences [11]	J96U	–0.1	–0.1
Differences not elsewhere classified[12]	JHE8	–0.1	–0.1
DUKES demand	J96V	221.2	217.8

Source: AEA Energy & Environment, DECC, ONS

1 Digest of UK Energy Statistics (Tables 1.1, 2.4 & 3.2)
2 Energy generated by UK households and businesses transport and travel abroad, net of emissions generated by non-residents travel and transport in the UK
3 Energy Account figures include marine bunker fuel use. These are not included in the demand figures given by DUKES
4 The Energy Account includes some fuels which are not treated as fuels by DUKES (this includes gases used by the offshore industry, waste solvents, waste lubricants, orimulsion and petroleum coke).
5 Includes Crown Dependencies: Guernsey, Jersey, Isle of Man.
6 The Energy Account does not include that energy in fuels which is transformed into another fuel type, whereas both the primary fuel and the transformed fuel are shown in DUKES commodity balances
7 Tars and benzoles created as a by-product of coke ovens are treated as energy in DUKES but not in the greenhouse gas inventory or Energy Account
8 The demand figures in DUKES include non-energy uses which are not included in the Energy Account
9 Some energy given in the DUKES commodity tables is not included in the Energy Account (these include geothermal, solar etc)
10 The demand figures in DUKES include losses of natural gas not included in the Energy Account
11 In the Energy Account a single gross calorific value is used for coke and coke breeze. Separate values are applied in DUKES
12 Elements of energy consumption (for some renewables and waste) are estimated separately for DUKES and the Environmental Accounts. Independent sources result in small differences.

C Atmospheric emissions 2007

	Total greenhouse gas emissions	Carbon Dioxide (CO2)	Methane (CH4)	Nitrous Oxide (N2O)	Hydrofluoro-carbons (HFCs)	Perfluoro-carbons (PFCs)	Sulphur hexafluoride (SF6)
Thousand tonnes CO2 equivalent							
Agriculture	49 769	6 006	18 276	25 434	52	–	–
Mining and quarrying	27 377	23 028	3 830	455	64	–	–
Manufacturing	109 522	103 646	419	3 524	1 459	216	259
Electricity, gas and water supply	195 810	189 690	4 460	1 140	108	–	412
Construction	10 785	10 190	8	471	117	–	–
Wholesale and retail trade	18 738	15 646	21	217	2 854	–	–
Transport and communication	92 171	90 673	50	1 208	241	–	–
Other business services	7 002	6 469	9	71	453	–	–
Public administration	8 862	8 679	11	77	95	–	–
Education, health and social work	8 083	7 787	15	31	250	–	–
Other services	27 807	5 127	21 046	1 341	171	–	121
Households	151 181	146 158	556	778	3 688	–	–
Total	**707 106**	613 100	48 700	34 746	9 552	216	792
of which, emissions from road transport	125 093	123 673	147	1 273	–	–	–

	Total acid rain precursors	Sulphur Dioxide (SO2)	Nitrogen Oxides (NOx)	Ammonia (NH3)
Thousand tonnes SO2 equivalent				
Agriculture	508	6	38	464
Mining and quarrying	86	16	69	–
Manufacturing	384	205	168	11
Electricity, gas and water supply	543	285	256	1
Construction	45	3	42	–
Wholesale and retail trade	48	1	47	–
Transport and communication	707	256	451	1
Other business services	13	1	12	–
Public administration	38	8	24	6
Education, health and social work	11	3	8	–
Other services	35	1	11	22
Households	210	23	151	36
Total	2 629	810	1 277	542
of which, emissions from road transport	330	2	316	12

	Thousand tonnes					**Tonnes**		
	PM10[1]	CO	NMVOC[2]	Benzene	Butadiene	Lead	Cadmium	Mercury
Agriculture	19.95	44.98	82.05	0.21	0.08	0.46	0.04	0.02
Mining and quarrying	12.85	36.94	126.51	0.38	0.02	0.33	0.06	0.02
Manufacturing	29.82	613.08	321.90	2.28	0.46	57.47	1.76	3.07
Electricity, gas and water supply	9.92	87.78	44.86	0.47	0.01	2.64	0.20	2.49
Construction	6.99	52.83	61.88	0.22	0.11	0.43	0.05	0.01
Wholesale and retail trade	4.29	66.21	58.14	0.26	0.16	1.91	0.05	0.01
Transport and communication	45.65	132.07	46.78	2.92	0.79	3.39	1.44	0.10
Other business services	1.36	30.29	3.83	0.09	0.03	0.10	0.03	–
Public administration	1.58	30.73	4.42	0.25	0.05	0.53	0.03	0.04
Education, health and social work	0.66	10.98	2.00	0.05	0.01	0.40	0.01	0.04
Other services	1.19	81.23	26.34	1.60	0.16	0.13	0.05	1.30
Households	34.86	949.13	247.52	10.03	0.54	4.67	0.37	0.14
Total	169.12	2 136.25	1 026.23	18.76	2.42	72.47	4.09	7.23
of which, emissions from road transport	25.08	794.94	89.20	2.25	1.30	1.75	0.42	–

1 PM10 is particulate matter arising from various sources including fuel combustion quarrying and construction, and formation of 'secondary' particles in the atmosphere from reactions involving other pollutants sulphur dioxide, nitrogen oxides, ammonia and NMVOCs

2 Non-methane Volatile Compounds, including benzene and 1,3-butadiene.

Source: AEA Energy & Environment, ONS

D Greenhouse gas and acid rain precursor emissions

		1990	2000	2001	2002	2003	2004	2005	2006	2007
Thousand tonnes CO2 equivalent										
Greenhouse gases - CO2,CH4,N2O,HFC,PFCs and SF6[1]										
Agriculture	JKRH	62 389†	57 034†	54 016	54 198	53 805	53 549	52 518	51 306	49 769
Mining and quarrying	JKRJ	40 826†	34 352†	34 660	34 028	32 688	31 341	30 269	27 220	27 377
Manufacturing	JKRK	173 348†	131 468†	126 201	117 911	119 113	116 473	116 714	111 850	109 522
Electricity, gas and water supply	JKRL	216 941†	174 782†	186 722	181 709	189 661	190 000	191 352	199 676	195 810
Construction	JKRM	8 573†	9 547†	9 594	9 743	9 832	10 155	10 523	10 518	10 785
Wholesale and retail trade	JKRN	14 691†	20 761†	20 091	19 610	19 655	20 185	19 326	18 531	18 738
Transport and communication	JKRO	64 196†	83 530†	87 667	88 374	91 640	96 647	99 766	92 822	92 171
Other business services	JKRP	6 920†	7 606†	7 919	6 832	7 047	6 877	7 015	6 881	7 002
Public administration	JKRQ	10 604†	8 684†	9 101	9 250	8 580	8 732	8 575	8 392	8 862
Education, health and social work	JKRR	10 449†	10 076†	10 031	8 175	8 434	8 985	8 704	8 553	8 083
Other services	JKRS	58 261†	39 138†	35 674	32 574	29 699	28 223	28 119	28 079	27 807
Total non-household	IGK4	667 197†	576 976†	581 677	562 404	570 154	571 167	572 882	563 827	555 925
Households	JKRT	142 258†	156 494†	160 079	159 002	159 402	162 288	158 658	155 273	151 181
Total greenhouse gas emissions	JKRU	**809 456†**	**733 470†**	**741 756**	**721 406**	**729 556**	**733 455**	**731 541**	**719 099**	**707 106**
of which, road transport emissions from all industries[2]	JKRV	111 823†	120 563†	120 280	122 616	122 368	123 158	123 487	123 841	125 093
of which, total emissions from water transport industry[3]	F8ZP	17 010†	16 141†	20 551	22 280	23 779	27 450	27 301	19 395	17 690
of which, total emissions from air transport industry[4]	F8ZQ	20 318†	37 273†	36 754	36 065	37 314	39 518	42 785	43 577	43 502

		1990	2000	2001	2002	2003	2004	2005	2006	2007
Thousand tonnes SO2 equivalent										
Acid rain precursor emissions - SO2,NOx,NH3[5]										
Agriculture	JKRW	693†	571†	562	551	537	544	527	523	508
Mining and quarrying	JKRX	98†	84†	79	77	91	86	89	93	86
Manufacturing	JKRY	937†	471†	453	411	404	412	412	397	384
Electricity, gas and water supply	JKRZ	3 273†	1 102†	1 021	930	950	766	653	641	543
Construction	JKSA	70†	63†	61	59	56	54	52	48	45
Wholesale and retail trade	JKSB	86†	66†	60	59	55	59	55	50	48
Transport and communication	JKSC	749†	707†	830	867	908	1 019	1 009	761	707
Other business services	JKSD	34†	22	22†	18	17	16	15	14	13
Public administration	JKSE	78†	48	48	44†	36	41	39	40	38
Education, health and social work	JKSF	61	21	19	14	14	14	13†	13	11
Other services	JKSG	66†	42	44	40	40	39†	38	39	35
Total non household	IGK5	6 144†	3 197†	3 199	3 070	3 108	3 050	2 902	2 620	2 418
Households	JKUK	639†	391†	357	321	293	273	245	230	210
Total acid rain precursor emissions	JKUL	**6 783†**	**3 588†**	**3 555**	**3 391**	**3 401**	**3 323**	**3 147**	**2 850**	**2 629**
of which, road transport emissions from all industries[2]	JKUM	826†	566†	522	486	449	419	386	359	330

1 Carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbon and sulphur hexafluoride expressed as thousand tonnes of carbon dioxide equivalent.
2 Includes emissions from all road transport sources (eg HGVs, LGVs, cars and motorcycles) across all industries
3 Emissions from water transport industry (Environmental Accounts code 69)
4 Emissions from air transport industry (Environmental Accounts code 70)
5 Sulphur dioxide, nitrogen oxides and ammonia expressed as thousand tonnes of sulphur dioxide equivalent.

Source: AEA Energy & Environment, ONS

E Greenhouse gas emissions bridging table
National Accounts measure to UNFCCC [1] measure

Thousand tonnes CO2 equivalent

		1990	2000	2001	2002	2003	2004	2005	2006	2007
Greenhouse gases - CO2,CH4,N2O,HFC,PFCs and SF6[2]										
Environmental Accounts	**JKRU**	809 456†	733 470†	741 756	721 406	729 556	733 455	731 541	719 099	707 106
less										
Bunker emissions[3]	**A43J**	22 598†	36 381†	36 324	34 689	35 187	38 777	41 346	42 863	42 282
CO2 biomass[4]	**A43K**	2 980	6 573	7 261	7 506†	8 366	9 548	10 801	10 882	11 654
Cross boundary [5]	**A43L**	12 933†	17 191†	21 112	23 648	25 480	26 951	26 890	17 671	16 721
plus										
Crown Dependancies[6]	**EQ44**	1 649†	1 907†	1 607	1 575	1 485	1 472	1 493	1 540	1 537
Land, Land-Use Change and Forestry (LULUCF)[7]	**A43M**	2 966†	–301†	–418	–936	–977	–1 729	–1 881	–1 752	–1 750
DECC reported (Excl. Overseas Territories)[8,9]	**JHE9**	775 565	674 942	678 259	656 211	661 038	657 928	652 123	647 476	636 241
plus										
Overseas territories (including net emissions from land use change/forestry)	**JHF3**	1 552	1 887	1 967	1 960	2 017	2 087	2 107	2 186	2 252
UNFCCC Reported in the UK Greenhouse Gas Inventory [10]	**A43N**	777 118†	676 829†	680 226	658 171	663 055	660 014	654 230	649 663	638 493
Kyoto greenhouse gas basket (baseline taken from the Assigned Amount Report)[8,9]	**JHF2**	772 978	674 743	678 158	656 424	661 134	658 650	652 813	647 949	636 616

Source: AEA energy & environment, DEFRA, ONS

1 United Nations Framework Convention on Climate Change
2 Carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbon and sulphur hexafluoride expressed as thousand tonnes of carbon dioxide equivalent.
3 Bunker emissions include IPCC memo items International Aviation (source no. 126) and international Shipping (source no. 127)
4 Emissions arising from wood, straw, biogases and poultry litter combustion for energy production.
5 Emissions generated by UK households and businesses transport and travel abroad, net of emissions generated by non-residents travel and transport in the UK.
6 Emissions of Crown dependancies; Guernsey, Jersey, Isle of Man
7 Emissions from deforestation, soils and changes in forest and other woody biomass.
8 http://www.defra.gov.uk/envirnoment/statistics/globatmos/download/xls/ghg_ annex_a_20090203.xls
9 This is the UK total for the sum of the 6 individual pollutants and differs slightly from the Kyoto greenhouse gas basket totals which uses a narrower definition of Land use, Land Use Change and Forestry and includes emissions from UK Overseas Territories (Gibraltar. Falkland Islands, Cayman Islands, Montserrat, Bermuda). The Kyoto basket total is presented in italics at the end of this table for reference.
10 http://www.airquality.co.uk/reports/cat07/0905131425_ukghgi-90-07_main_chapters_Issue2_UNFCCC_CA_v5_Final.pdf

F Government revenues from environmental taxes

£ million

		2000	2001	2002	2003	2004	2005	2006	2007	2008
Energy										
Duty on hydrocarbon oils	GTAP	23 041	22 046	22 070	22 476	23 412	23 346	23 448	24 512	24 788
including										
Unleaded petrol[1,3]	GBHE	11 481†	1 906	–	–	–	–	–	–	–
Leaded petrol/LRP[2]	GBHL	1 105†	650	103	70	67	20	15	13	9
Ultra low sulphur petrol	ZXTK	968†	10 117	12 624	12 098	12 160	11 688	11 274	11 213	10 903
Diesel[3]	GBHH	23	65†	–	–	–	–	–	–	–
Ultra low sulphur diesel	GBHI	9 014†	8 492	9 029	9 457	10 168	10 829	11 203	12 017	12 352
VAT on duty	CMYA	4 032	3 858	3 862	3 933	4 097	4 086	4 103	4 290	4 338
Fossil fuel levy	CIQY	56	86	32	–	–	–	–	–	–
Gas levy	GTAZ	–	–	–	–	–	–	–	–	–
Climate change levy	LSNT	–	585	825	828	756	747	711	690	735
Hydro-benefit	LITN	42	46	44	44	40	10	–	–	–
Road vehicles										
Vehicle excise duty	CMXZ	4 606	4 102	4 294	4 720	4 763	4 762	5 010	5 384	5 524
Other environmental taxes										
Air passenger duty	CWAA	940	824	814	781	856	896	961	1 883	1 876
Landfill tax	BKOF	461	502	541	607	672	733	804	877	916
Aggregates levy	MDUQ	–	–	213	340	328	327	321	339	335
Total environmental taxes	JKVW	**33 178**	**32 049**	**32 695**	**33 729**	**34 924**	**34 907**	**35 358**	**37 975**	**38 512**
Environmental taxes as a % of:										
Total taxes and social contributions	JKVX	9.3	8.6	8.7	8.5	8.3	7.7	7.2	7.4	7.2
Gross domestic product	JKVY	3.4	3.1	3.0	3.0	2.9	2.8	2.7	2.7	2.7

The earliest revision is represented by a cross

Source: ONS, Department for Energy and Climate Change

1 Unleaded petrol includes superunleaded petrol.
2 Lead Replacement Petrol (the alternative to 4-Star leaded petrol introduced in 2000) is lead-free.
3 Duty incentives have concentrated production on ultra low sulphur varieties.

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