A National Statistics Publication

DEPARTMENT OF ENERGY & CLIMATE CHANGE

ENERGY TRENDS

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The United Kingdom Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the UK Statistics Authority: Code of Practice for Official Statistics.

Designation can be broadly interpreted to mean that the statistics:
- meet identified user needs
- are well explained and readily accessible
- are produced according to sound methods, and
- are managed impartially and objectively in the public interest

Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed.

Explanatory notes are to be found inside the back cover

Contents

The cover illustration used for Energy Trends and other DECC energy statistics publications is from a photograph by David Askew. It was a winning entry in the DTI News Photographic Competition in 2002.

Introduction

Energy Trends and Quarterly Energy Prices are produced by the Department of Energy and Climate Change (DECC) on a quarterly basis. Both periodicals are published concurrently in June, September, December and March. The June editions cover the first quarter of the current year.

Energy Trends includes information on energy as a whole and by individual fuels. The text and charts provide an analysis of the data in the tables. The tables are mainly in commodity balance format, as used in the annual Digest of UK Energy Statistics. The 2010 edition of the Digest was published on 29 July 2010. Printed and bound copies of the 2010 Digest can be obtained from The Stationery Office and an electronic version is available on the Internet at:
www.decc.gov.uk/en/content/cms/statistics/publications/dukes/dukes.aspx

The balance format shows the flow of a commodity from its sources of supply, through to its final use. The articles provide in-depth information on current issues within the energy sector.

The text and tables included in this publication represent a snapshot of the information available at the time of publication. However, the data collection systems operated by DECC, which produce this information, are in constant operation. New data are continually received and revisions to historic data made. To ensure that those who use the statistics have access to the most up-to-date information, revised data will be made available as soon as possible, via the electronic versions of these tables. The electronic versions are available free of charge from the DECC website. In addition to quarterly tables, the main monthly tables that were published in the period up to May 2001 when Energy Trends was produced monthly, continue to be updated and are also available on the DECC website. Both sets of tables can be accessed at:
www.decc.gov.uk/en/content/cms/statistics/source/source.aspx

Annual data for 2010 included within this edition is on a provisional basis. New data are continually received and revisions to previous data made. Finalised figures for 2010 will be published on the 28 July 2011 in the annual Digest of UK Energy Statistics.

Energy Trends does not contain information on Foreign Trade, Temperatures, Wind Speeds and Prices. Foreign Trade, Temperatures and Wind Speeds tables are, however, available on the DECC website at www.decc.gov.uk/en/content/cms/statistics/source/source.aspx. Information on Prices can be found in the Quarterly Energy Prices publication and on the DECC website at:
www.decc.gov.uk/en/content/cms/statistics/publications/prices/prices.aspx

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The main points for the first quarter of 2011:

- Total energy production was 11 per cent lower than in the first quarter of 2010.

- Oil production was 15½ per cent lower than in the first quarter of 2010, due to maintenance activity and slowdowns.

- Natural gas production was 17½ per cent lower compared with the first quarter of 2010. Net imports of gas increased by ½ per cent. Liquefied Natural Gas (LNG) accounted for 43½ per cent of gas imports.

- Coal production was 31 per cent higher than a year earlier and have now returned to average levels seen in the last few years. Coal imports were 1 per cent lower than a year earlier. Generators' demand for coal was up 8 per cent.

- Total primary energy consumption for energy uses fell by 6½ per cent in the first quarter of 2011 compared with the same period of 2010. When adjusted to take account of weather differences between 2010 and 2011, primary energy consumption fell by 2 per cent. The average temperature in the first quarter of 2011 was 5.6 degrees Celsius, 2.2 degrees above that recorded in the first quarter of 2010.

- Final energy consumption fell by 6½ per cent between the first quarter of 2010 and the first quarter of 2011, with falls in all sectors mainly due to the milder weather conditions.

- Gas demand was 15 per cent lower than a year earlier, with a decrease in gas used for electricity generation, and warmer weather particularly in February led to a large decrease in domestic consumption.

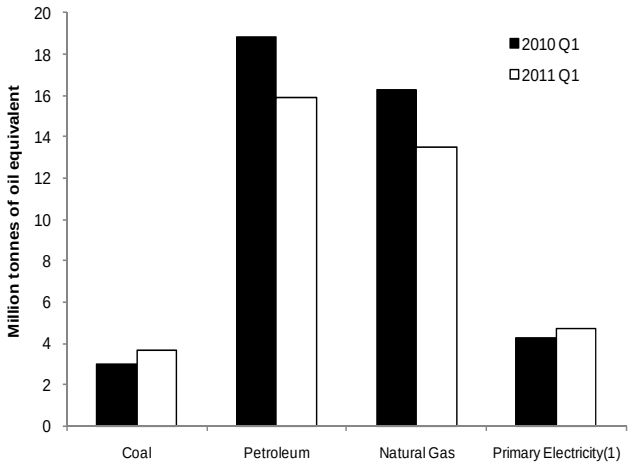
- Electricity consumption was 2½ per cent lower than in the first quarter of 2010.

- Of electricity supplied in the first quarter of 2011, gas accounted for a share of 38 per cent down 9 percentage points on a year earlier, whilst coal accounted for a 34 per cent share up 3 percentage points. Nuclear's supply increased by 7 per cent on the first quarter of 2010 to account for 18 per cent of the total. Net imports of electricity rose from -1.7 TWh to +1.1 TWh.

- Wind, hydro and other renewables supplied 27½ per cent more electricity than in the same period last year, with hydro up 56 per cent as a result of more rainfall. Wind, hydro and other renewables accounted for 8 per cent of the total generation.

Section 1 - Total Energy

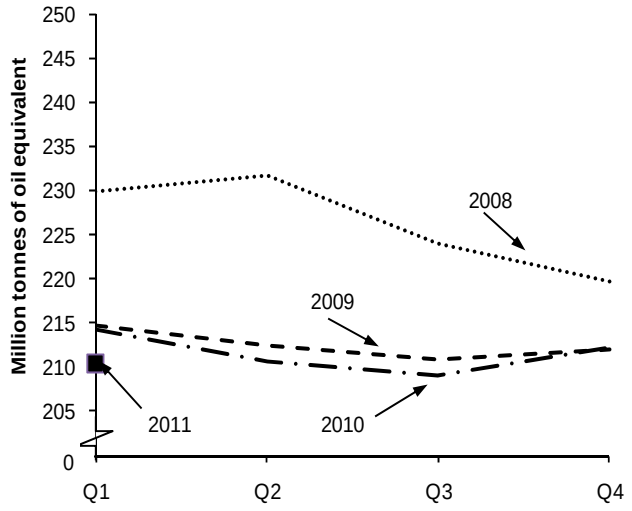
Chart 1.1 Production of indigenous primary fuels



(1) Nuclear and wind & natural flow hydro electricity.

- Total production in the first quarter of 2011 at 37.8 million tonnes of oil equivalent was 10.9 per cent lower than in the first quarter of 2010.
- In the first quarter of 2011 production of coal and other solid fuels was 23.2 per cent higher than the corresponding period of 2010.
- Production of petroleum fell by 15.5 per cent while production of natural gas was 17.2 per cent lower than in the first quarter of 2010.
- Primary electricity output in the first quarter of 2011 was 9.3 per cent higher than in the first quarter of 2010 within which nuclear electricity output was 6.9 per cent higher and output from wind and natural flow hydro was 43.5 per cent higher than the same period of 2010.

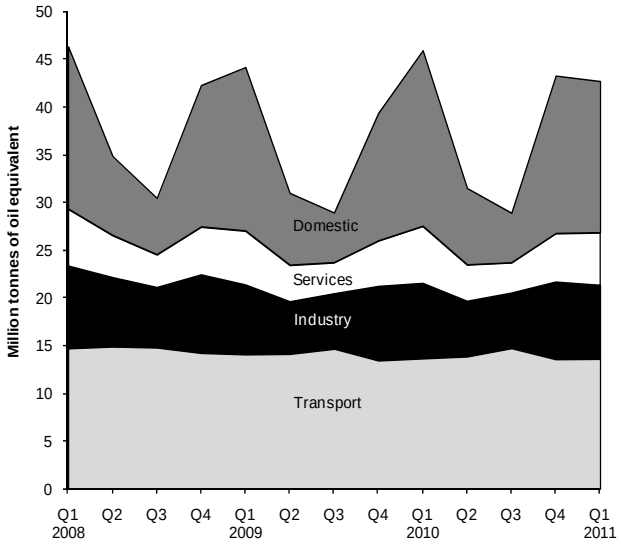
Chart 1.2 Total inland consumption (primary fuel input basis)(1)



(1) Seasonally adjusted and temperature corrected annual rates.

- Total inland consumption on a primary fuel input basis (temperature corrected, seasonally adjusted annualised rate) was 210.4 million tonnes of oil equivalent in the first quarter of 2011, 1.8 per cent lower than in the first quarter of 2010. The average temperature in the first quarter of 2011 was 2.2 degrees Celsius warmer than the same period a year earlier.
- Between the first quarter of 2010 and the first quarter of 2011 (on a seasonally adjusted and temperature corrected basis) coal and other solid fuel consumption rose by 11.3 per cent.
- Also on a seasonally adjusted and temperature corrected basis, oil consumption rose by 0.6 per cent between the first quarter of 2010 and the first quarter of 2011.
- On the same basis, natural gas consumption fell by 11.1 per cent between the first quarter of 2010 and the first quarter of 2011, as a result of the switch from gas to coal for electricity generation.

Chart 1.3 Final energy consumption by user



- Total final energy consumption fell by 6.5 per cent between the first quarter of 2010 and the first quarter of 2011, due to milder weather especially in February 2011.
- Domestic sector energy consumption fell by 13.9 per cent.
- Service sector energy consumption fell by 8.0 per cent.
- Industrial sector energy consumption fell by 2.1 per cent.
- Transport sector energy consumption fell by 0.3 per cent.

Background

Relevant tables

Production

Indigenous production of energy was 5.8 per cent lower in 2010 than in 2009, continuing a year on year decline for each year since 2000. Coal and other solid fuel production rose by 1.3 per cent, petroleum production fell by 7.7 per cent, gas production fell by 4.1 per cent and primary electricity output fell by 9.7 per cent.

Petroleum accounted for 42.1 per cent of total indigenous production in the first quarter of 2011 while natural gas accounted for 35.8 per cent, coal and other solid fuels 9.7 per cent and primary electricity output 12.4 per cent. A year earlier the proportions were petroleum 44.4 per cent, natural gas 38.5 per cent, coal and other solid fuels 7.0 per cent and primary electricity output 10.1 per cent.

Total inland consumption

In 2010 consumption of primary fuels was higher than the preceding year, 3.1 per cent up on 2009. The largest contribution to this rise in absolute terms was from natural gas (which increased by 8.3 per cent) and coal (which increased by 4.5 per cent). On a temperature corrected basis, consumption in 2010 was 0.4 per cent lower than in 2009.

Total inland energy consumption, on a primary fuel input basis (not temperature corrected or seasonally adjusted), in the first quarter of 2011 was 60.6 million tonnes of oil equivalent, 6.6 per cent lower than in the corresponding period a year ago.

Consumption by final users

Final energy consumption shows a strong seasonal pattern with more energy being consumed in the winter months and less in the summer, particularly in the domestic and service sectors.

In the first quarter of 2011 the domestic sector was responsible for the largest share of final consumption at 35 per cent of all energy consumed by final users. The transport sector was responsible for a further 30 per cent, the industrial sector for another 17 per cent and the service

industries, including agriculture, consumed 12 per cent. The remaining 5 per cent was made up by fuel use for non-energy purposes.

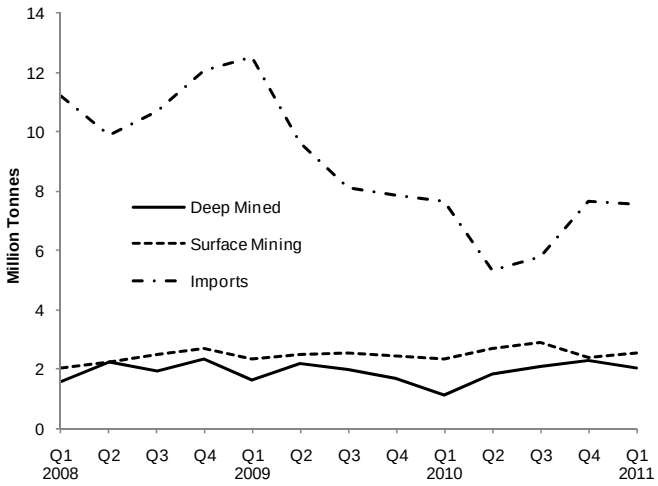
Dependency

In the first quarter of 2011 net import dependency was 35.9 per cent, its highest level for over 30 years, up 6.8 percentage points from the first quarter of 2010. This rise was due to falls in oil and gas production as a result of maintenance activity and slowdowns.

Dependency on fossil fuels in the first quarter of 2011 was 88.8 per cent, down 1.8 percentage points from the first quarter of 2010.

Section 2 - Solid Fuels and Derived Gases

Chart 2.1 Coal production and imports

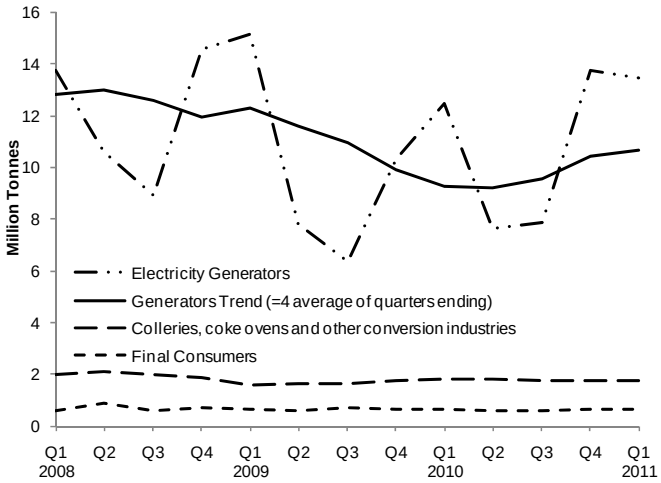


- Provisional data for the first quarter of 2011, at 4.7 million tonnes, were 31.1 per cent higher than in the first quarter of 2010. This was a result of a 79.2 per cent increase in deep mined production, after a series of face gaps* at the start of 2010. Surface mine production was also up by 9.2 per cent.

  * A face gap is when a panel of coal finishes production and the panel of coal that is due to take over production is not ready to start.

- Imports of coal in the first quarter of 2011 were 1.2 per cent lower than in the first quarter of 2010 at 7.6 million tonnes.

Chart 2.2 Coal consumption

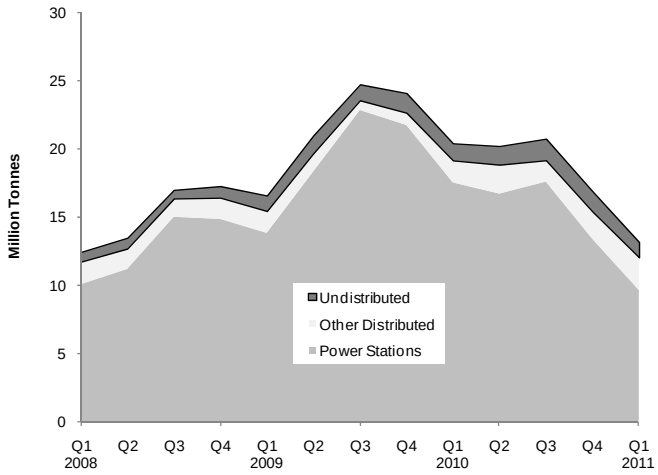


- Total demand for coal in the first quarter of 2011, at 15.8 million tonnes, was 6.2 per cent up on demand in the first quarter of 2010; consumption by electricity generators was up by 8.0 per cent over the same period.

- Electricity generators accounted for 85 per cent of total coal use in the first quarter of 2011; compared with 84 per cent a year earlier.

- Provisionally, final consumption (as measured by disposals to final consumers) was down by 4.7 per cent in the first quarter of 2011.

Chart 2.3 Coal stocks



- Coal stocks showed a seasonal fall of 3.7 million tonnes during the first quarter of 2011 and at the end of March 2011 stood at 13.2 million tonnes, 7.2 million tonnes lower than at the end of March 2010.
- The level of coal stocks at power stations at the end of the first quarter of 2011 was 9.6 million tonnes. This was 7.9 million tonnes lower than the corresponding level a year earlier and are at their lowest level for 5 years.
- Stocks held by producers (undistributed stocks) also decreased during the first quarter of 2011 to stand at 1.1 million tonnes, 0.1 million tonnes lower than at the end of March 2010.

Background

Relevant tables

Coal production and imports

In 2005, for the first time ever surface mine production exceeded deep mined production. Deep mined production recovered towards the end of 2005. However, it fell back in the second half of 2006 with the closure of Rossington and the mothballing of Harworth. These closures, geological difficulties and other one-off factors continued to suppress deep mined production and in 2009 production was at its lowest (7.5 million tonnes) since records began. The mothballing of Welbeck colliery and face gaps in production during the first quarter of 2010 meant deep mined production was at its lowest (1.1 million tonnes) in this quarterly series. It has since picked up and production currently stands at 2.0 million tonnes in the first quarter of 2011. Surface mine production has been on an upward trend since the third quarter of 2006 where it stood at 1.9 million tonnes, it currently stands at 2.6 million tonnes in the first quarter of 2011. Coal imports stands at 7.6 million tonnes in the first quarter of 2011, the lowest total recorded for the first quarter in this series.

Coal consumption

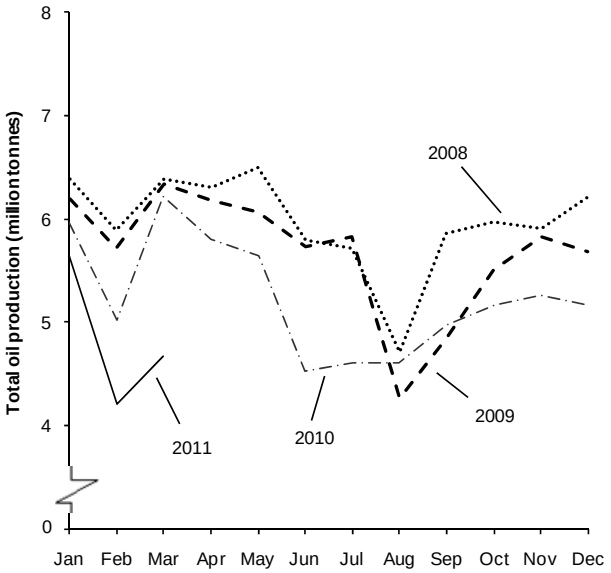
Overall, coal use by electricity generators has been generally declining since the first quarter of 2006, when demand peaked at 19.0 million tonnes. This decline is partly due to higher coal prices making gas more competitive for generation. Generators use of coal was at its lowest level since records began in the third quarter of 2009 (6.4 million tonnes) but has more than doubled since then to 13.4 million tonnes in the first quarter of 2011, as a result of less gas being used by generators.

Stocks

Generally, coal stocks levels show a seasonal trend over an annual period. Stocks are at their lowest at the end of the first quarter of the year to help meet the demand by generators during the winter period. The demand for coal for generation tends to be lower over the summer, therefore, stocks levels tend to be the highest for the year at the end of the third quarter. In particular, total stocks were at their highest (24.7 million tonnes) at the end of the third quarter of 2009. These levels were last seen at the end of 1994. Since then stocks have slowly started to decline but fell quite sharply between the end of the fourth quarter in 2009 (24.1 million tonnes) to 20.4 million tonnes at the end of the first quarter in 2010 to help meet demand during January 2010 where weather conditions were exceptionally cold. Due to more exceptionally cold weather, as one factor in January 2011 leading to higher coal generation, total coal stocks fell sharply again between the end of the fourth quarter in 2010 and the first quarter in 2011 and now stand at 13.2 million tonnes.

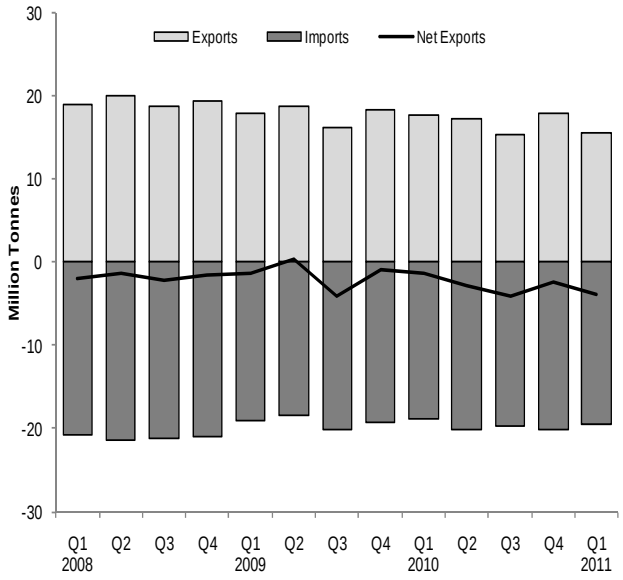
Section 3 - Oil and Oil Products

Chart 3.1 Production of crude oil and NGLs



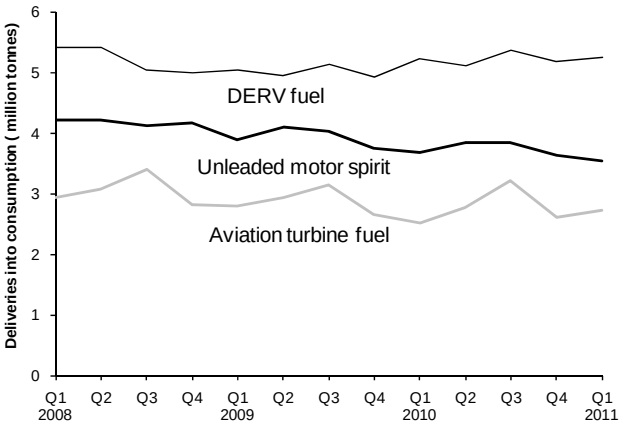
- Total indigenous UK production of crude oil and NGLs in the first quarter of 2011 was 15.5 per cent lower than a year earlier.
- This is the largest quarterly decrease since quarterly reporting began in 1995, and reflects near record decreases in crude oil production and record decreases in NGL production. Maintenance and other production issues, alongside the long-term reduction, were the main causes of the decrease.

Chart 3.2 UK trade in crude oils, NGLs and petroleum products



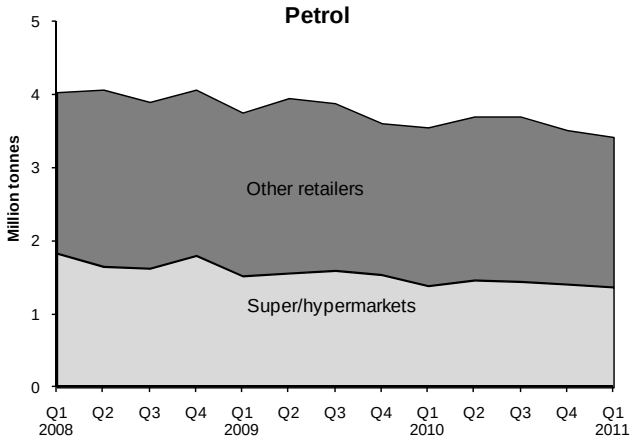
- During the first quarter of 2011 the UK was a net importer of oil and oil products by almost 4 million tonnes, This is an over a three-fold increase on the first quarter of 2010.
- The UK was a net importer of crude oil, NGLs and feedstocks in the first quarter of 2011. With production substantially decreased, imports increased by 10.6 per cent compared with Q1 2010. Exports decreased by 22.6 per cent over the same period.
- In the first quarter of 2011 the UK was a net exporter of petroleum products (by 0.9 million tonnes).
- Imports of petroleum products decreased during the first quarter of 2011, by 11.7 per cent compared with a year earlier. Exports rose by 6.9 per cent over the same period.

Chart 3.3 Demand for key transport fuels

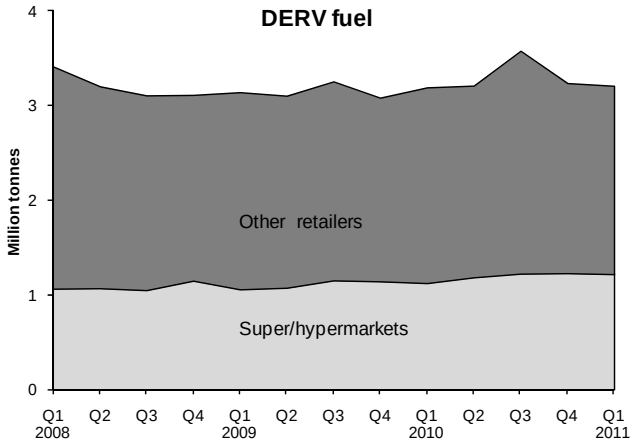


- Total deliveries of transport fuels were broadly flat when compared with the first quarter of 2010.
- Motor spirit deliveries fell by 3.8 per cent. This is broadly in line with the quarterly decreases in recent years.
- Deliveries of Diesel engine road vehicle fuel (DERV) increased by 0.4 per cent. This is a smaller increase than that seen over recent quarters which have averaged around 4 per cent per year.
- DERV fuel's share of road transport fuels in the first quarter of 2011 remained relatively static: 59.7 per cent compared to 58.7 per cent in the first quarter of 2010.
- Deliveries of aviation turbine fuel were 7.7 per cent higher, which is largely a reaction to the disruptions caused by snow in the first quarter of 2010.

Chart 3.4 Super/hypermarket shares of retail deliveries

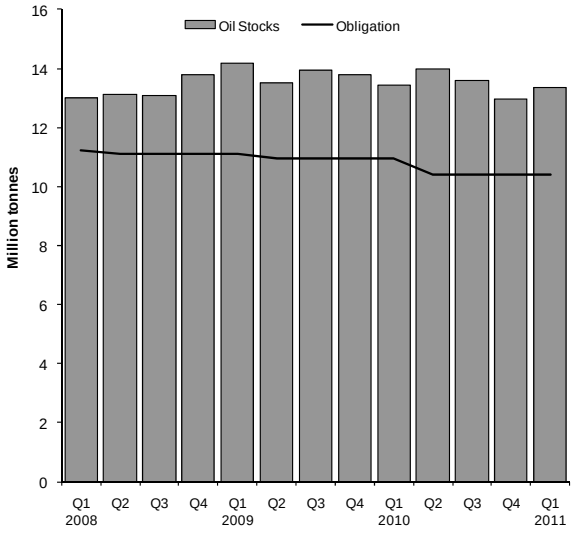


- Sales of motor spirit by super/hypermarket companies accounted for 40.1 per cent of overall retail sales in the first quarter of 2011, up from 39.1 per cent in the first quarter of 2010.



- Sales of DERV fuel by super/hypermarket companies accounted for 38.1 per cent of overall retail sales in the first quarter of 2011, up from 35.3 per cent in the first quarter of 2010.

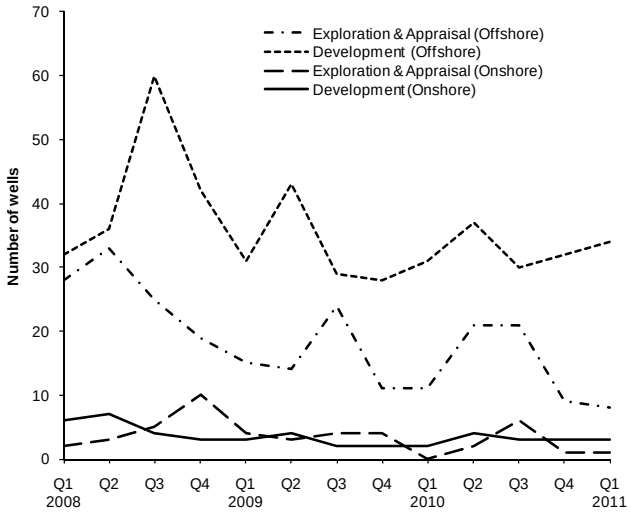
Chart 3.5 Stocks of key oil products[(1)]



(1) This includes motor spirit, DERV fuel, other gas diesel oils, aviation turbine fuel, kerosene and fuel oils.

- Overall, stocks of crude oil, process oils, and petroleum products were 2.2 per cent lower at the end of the first quarter of 2011 than a year earlier.
- Crude oil and refinery process oil stocks were 5.0 per cent higher than a year earlier. Stocks of products were 7.1 per cent lower over the same period.
- Stocks at UKCS pipeline terminals decreased by 10.1 per cent (0.2 million tonnes) in the first quarter of 2011, compared with the last year.
- Chart 3.5 combines stocks of products with the product equivalent of stocks of crude oil to give an overall level of UK stocks of key products.
- At the end of the first quarter of 2011, the UK held stocks equal to 86 days of consumption of these key products, compared with an obligation of 67½ days (see Background for more details).

Chart 3.6 Drilling activity on the UKCS



- 8 exploration and appraisal wells started offshore in the first quarter of 2011, compared to 11 in the corresponding quarter of 2010.
- 34 development wells were drilled offshore in the first quarter of 2011, compared to 31 in the corresponding quarter of 2010.
- 1 exploration and appraisal well started onshore in the first quarter of 2011, compared to none in the corresponding quarter of 2010.
- 3 development wells were drilled onshore in the first quarter of 2011, compared to 2 in the corresponding quarter of 2010.

Background

Relevant tables

Oil and Oil Products

Crude oil production and trade

Total UK production of crude oil and NGLs decreased in the first quarter of 2011 by 15.5 per cent (2.7 million tonnes) when compared to the same period last year. The general trend rate of annual decline has been around 7 per cent per year. Overall, the UK was a net importer of oil and oil products in the first quarter of 2011. Imports of crude oil and NGLs rose while exports fell compared to the same period a year earlier. The UK was a net exporter of petroleum products in the first quarter of 2011, with imports decreasing by 11.7 per cent and exports increasing by 6.9 per cent. The majority of UK production of crude oil and NGLs is exported, as indigenous UK crude oil tends to be the more valuable light/sweet type with lower sulphur levels and the relative modernity of UK refineries allows their use of less valuable or lower grade crude oil. Therefore the economics of crude oil markets results in significant volumes of crude oil being imported into the UK.

Refinery production of petroleum products and trade

The refinery output in the first quarter of 2011 was 17.1 million tonnes, 0.8 million tonnes (5.2 per cent) higher than the first quarter of 2010.

Demand for petroleum products

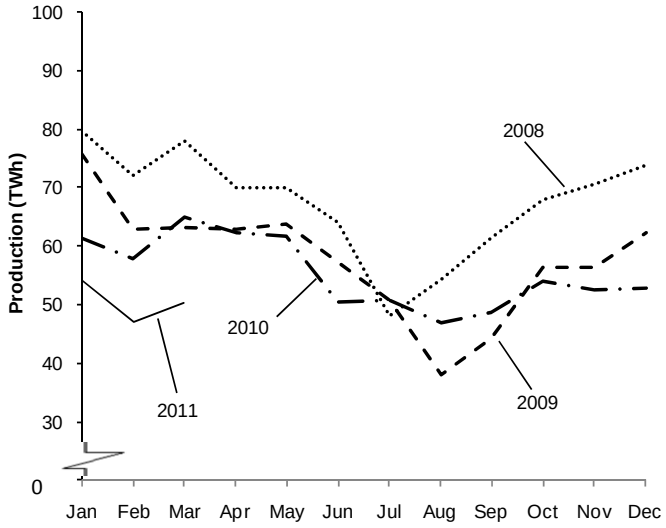
Overall demand for petroleum products in the first quarter of 2011 was 1.0 per cent lower than in the first quarter of 2010. Deliveries of motor spirit were lower by 3.8 per cent to 3.5 million tonnes and DERV deliveries increased by 0.4 per cent to 5.2 million tonnes. Deliveries of aviation turbine fuel were up by 7.7 per cent to 2.7 million tonnes.

Stocks of crude oil and petroleum products

The UK has an obligation under EU law to maintain stocks of key oil products at or above a certain level to ensure adequate supplies would exist for any international oil supply emergency. These obligations are based on the UK's annual consumption of the key products motor spirit, DERV fuel and other gas diesel oils, aviation fuel and other kerosenes and fuel oils. These obligations are usually updated every 1st July as consumption data for the previous year are finalised. Chart 3.5 above combines data on stocks of key oil products with the product equivalent of stocks of crude oil to give an overall level of UK stocks of key oil products to show how the UK is complying with these obligations at an overall level. The UK's current overall obligation, based on 2009 consumption data, is to hold a total of 10.4 million tonnes of these products, equal to 67½ days of consumption.

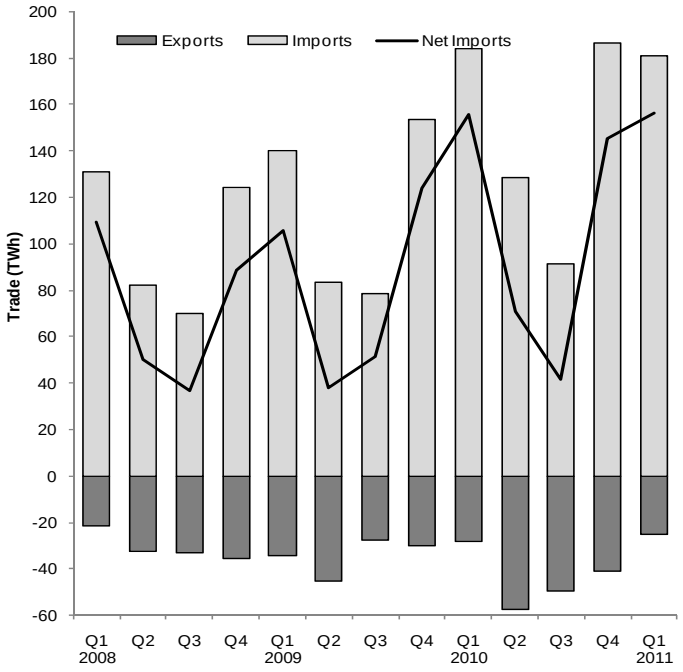
Section 4 – Gas

Chart 4.1 Production of natural gas



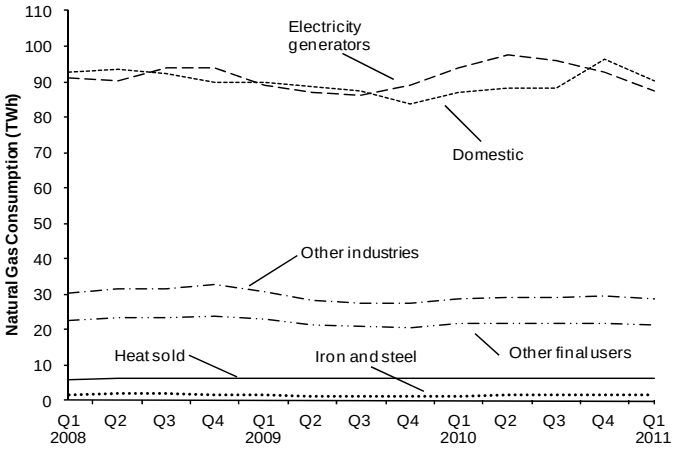
- Total indigenous production of natural gas in the first quarter of 2011 was 17.7 per cent lower than in the corresponding quarter a year earlier. This was partly due to maintenance work and slowdowns on a number of oil fields that produce associated gas.

Chart 4.2 UK trade in natural gas



- In the first quarter of 2011, compared with the same period of 2010, imports and exports of natural gas fell, respectively, by 1.5 and 12.4 per cent.
- Net imports of gas in the first quarter of 2011, at 156.1 TWh, were 0.4 per cent higher than in the corresponding quarter a year earlier.
- In the first quarter of 2011 Liquefied Natural Gas (LNG) imports accounted for 43.3 per cent of total gas imports and were approaching two thirds higher than in the first quarter of 2010. About three quarters of LNG imports came from Qatar in the first quarter of 2011 (see monthly table *ET4.4*).

Chart 4.3 Natural gas consumption - average of four quarter ending



- Demand for gas in the first quarter of 2011 was 15.2 per cent lower than the level in the first quarter of 2010.
- Natural gas use for electricity generation was 20.7 per cent lower than in the first quarter of 2010.
- In public administration, commerce and agriculture, consumption fell by 7.8 per cent compared with a year earlier. In the industrial sector, gas sales were 8.0 per cent lower than in the first quarter of 2010.
- Provisionally, consumption in the domestic sector fell by 15.5 per cent. Compared to a year earlier, temperatures were on average 2.2 degrees Celsius warmer, with a particularly warm February, 3.6 degrees Celsius warmer than 2010.

Background

Relevant table

4.1: Natural gas supply and consumption ……...Page 63

Gas production and trade

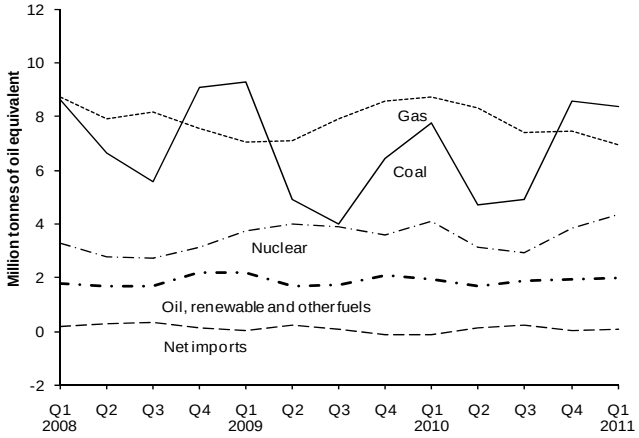
The UK currently exports gas to the Netherlands from the Chiswick, Grove, Markham, Minke, Stamford and Windermere fields, to the Irish Republic and the Isle of Man via the Irish – UK gas interconnector, to Belgium through the Bacton-Zeebrugge interconnector and to the Norwegian sector of the North Sea for injection into the Ula reservoir. Imports to the UK are from Belgium, via the interconnector, Norway, via the Gjøa/Vega (pipeline to FLAGS), Langeled, Tampen Link (Statfjord to FLAGS) and Vesterled pipelines, Netherlands via the BBL pipeline and Liquefied Natural Gas (LNG) from various sources.

Gas consumption

Much of the change in the use of gas for electricity generation in recent years is the result of changes in the relative prices of gas and coal. The downturn in 2005 resulted from generators preferring coal when prices reached very high levels at the end of the year. By the end of 2006, however, gas use had risen back to the levels of 2003 and 2004, as prices fell back. This increase continued through to 2007 and 2008. However, in 2009, gas use for generation decreased, mainly a result of less use during the first quarter of 2009 compared to the same period in previous years, when gas use for generation generally tends to be higher. This decline was short-lived as gas-fired generation increased in 2010, particularly during the first quarter of 2010 where levels (101,724 GWh) were on par with those seen during the first quarter of 2008 (101,728 GWh), the record high in this quarterly series. Despite the cold weather conditions, similar increases were not seen during the fourth quarter of 2010 (86,741 GWh) and first quarter of 2011 (80,661 GWh) compared to the same period in 2009 (99,415 GWh) and the start of 2010, in fact, levels had declined, due to more coal being used in the generation mix. Gas use in the domestic sector is particularly dependent on temperatures not only during the heating season, but also in summer, when very hot weather deters use for cooking and hot water. Temperatures in 2010 were on average 1.1 degrees Celsius cooler than 2009, resulting in an increase in domestic gas consumption on a year earlier. The exceptionally cold weather snap during December 2010 meant that domestic gas consumption during the fourth quarter of 2010 (138,866 GWh) was 30 per cent higher than the same period in 2009 (107,079 GWh). This pattern did not follow through into the start of 2011 where domestic consumption had fallen to 134,007 GWh compared to quarter 1 2010 (158,632 GWh). In fact, temperatures were 2.2 degrees Celsius warmer during quarter 1 2011, compared to same period in 2010.

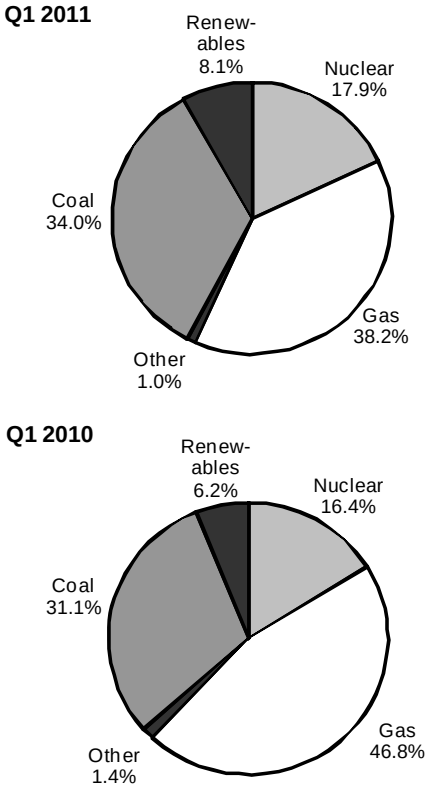
Section 5 - Electricity

Chart 5.1 Fuel used for electricity generation



- Fuel used by generators in the first quarter of 2011 was 2.8 per cent lower than in the first quarter of 2010.
- Coal use during the quarter was 7.9 per cent higher than a year earlier.
- Gas use was 20.6 per cent down and nuclear sources were 6.9 per cent up on the first quarter of 2011.

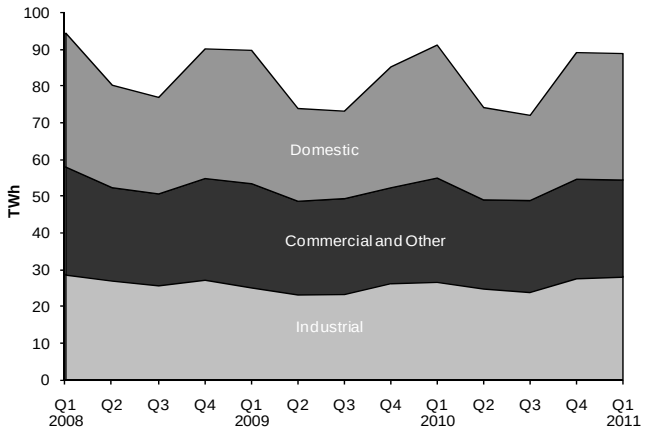
Chart 5.2 Electricity supplied[1]



- Total electricity supplied by all generators in the first quarter of 2011 was 2.0 per cent lower (-2.0 TWh) than a year earlier.
- Indigenous supply was 4.4 per cent lower (-4.8 TWh), while net imports were up from -1.7 TWh in the first quarter of 2010 to +1.1 TWh in the first quarter of 2011.
- The supply from coal rose by 7.1 per cent (+2.2 TWh), while supply from gas fired stations fell by 19.9 per cent (-9.4 TWh). The supply from nuclear stations rose by 6.9 per cent (+1.1 TWh). Wind, hydro and other renewables' supply rose by 27.4 per cent (+1.7 TWh). Of this, hydro was up 56.1 per cent due to much higher rainfall than in the first quarter of 2011, while wind was up 37.0 per cent, due to increased capacity and higher wind speeds compared with a year earlier.
- Between the first quarter of 2010 and the first quarter of 2011, coal's share of electricity supplied rose by 2.9 percentage points to 34.0 per cent, while nuclear's share rose by 1.5 percentage points to 17.9 per cent. Gas's share fell by 8.6 percentage points to 38.2 per cent. Renewables' share rose by 1.9 percentage points to 8.1 per cent. The share of other fuels fell 0.4 percentage points to 1.0 per cent.

[1] Shares in charts do not sum to 100% as two additional components often contribute negatively to total electricity supplied: pumped storage and net imports (which can be positive or negative).

Chart 5.3 Electricity consumption



- Final consumption of electricity fell by 2.5 per cent in the first quarter of 2011. Domestic use fell by 4.8 per cent and consumption by commercial, public administration, transport and agricultural customers was down by 7.0 per cent. Industrial use of electricity was 5.3 per cent higher.
- In the first quarter of 2011, temperatures were on average about 2.2 degrees Celsius warmer than in the first quarter of 2010.

Background

Relevant tables

Fuel use

Following the introduction of the Large Combustion Plant Directive in 2008 and a fall in the price of gas, gas use for electricity generation rose to a record level in the first quarter of 2008, before falling off through to the first half of 2009. As gas prices fell, however, the second half of 2009 saw gas use rise again, approaching the levels of early 2008, as coal use fell to a record low in the third quarter. Coal use continued to decline in the first half of 2010 compared with 2009, before rising in the next two quarters due to lower gas generation and increased demand. After continuing to increase in the first quarter of 2010, gas use fell in the second and third quarters. It rose slightly in the fourth quarter, but still much lower than a year earlier, before falling again in the first quarter of 2011, to its lowest level for over three years.

Supply

Total electricity supplied in the UK fell steadily between 2007 and 2009, with 2009 the lowest level since 1998. However, a cold 2010 saw electricity supplied increase once more. After falling to its lowest level since 1998 in 2007, and then further in 2008, due to the closure of two stations and a high level of outages, supply from nuclear increased again in late 2008, with 2009 increasing by almost a third on 2008. Outages in the second and third quarters of 2010 saw nuclear supply fall again, before rising in the next two quarters as stations came back online. Hydro and wind supply continually rose from 2007 to 2009, particularly the latter as new capacity continued to come online. After falling in the first half of 2010 due to low wind speeds, wind supply increased markedly in the next three quarters as capacity increased, reaching a record high in the fourth quarter of 2010. With low rainfall in the first three quarters, hydro fell by a third in 2010 on a year earlier, but rose in the first quarter of 2011 due to heavy rainfall. Imports and exports of electricity from and to continental Europe are volatile. After doubling in 2008, net imports fell by three-quarters in 2009, as the UK became a net exporter in the fourth quarter, for the first time in six years, continuing into the first quarter of 2010. However, in every quarter since, the UK has been a net importer.

Consumption

Final consumption fell steadily between 2005 and 2008. In 2009, there were large falls on a year earlier, with the year as a whole down by 5.7 per cent. In 2010 final consumption increased by 0.9 per cent due to the cold weather. Consumption in 2010 was divided 30.9 per cent to the domestic, 27.0 per cent to industry and 27.0 per cent to commerce, public administration, transport and agriculture. Fuel industries accounted for a further 7.6 per cent with the remaining 7.5 per cent accounted for by transmission and distribution losses.

Renewable energy in 2010

Introduction

This article updates the information on renewable energy published in the June 2010 edition of Energy Trends, and in the 2010 edition of the Digest of UK Energy Statistics. It also presents revised and additional information to that provided in the "Renewable Electricity" article within the March 2011 edition of Energy Trends.

Key messages

The amount of electricity generated from renewables sources in 2010 was 25,734 GWh, a 2.2 per cent increase during the year.

Offshore wind generation increased by 75 per cent, but onshore wind generation fell by 6 per cent.

Generation capacity increased by nearly 1.2 GW (15 per cent).

Heat from renewable sources increased by 17 per cent during 2010 (to 1,212 ktoe); renewable biofuels for transport also increased by 17 per cent (to 1,214 ktoe).

Renewable transport fuels accounted for 3.6 per cent of road transport fuels in 2010. Bioethanol, as a proportion of motor spirit, increased from 1.5 per cent to 3.1 per cent.

Renewable energy provisionally accounted for 3.3 per cent of energy consumption, as measured using the 2009 Renewable Energy Directive methodology. This is an increase of 0.3 percentage points from the 2009 position of 3.0 per cent.

A number of weather factors had a major impact on renewable electricity generation during 2010; rainfall was 63 per cent lower than in 2009, making it the driest year since 2003, and average wind speeds were at their lowest level this century. Whilst these factors affect the raw 2010 outputs of renewables, the key Directive measures use a normalisation approach to smooth the year on year impacts of variable wind and rain.

There are various national and internationally agreed measures of the contribution renewable electricity makes to the generation mix. These show that in 2010:

- 6.8 per cent of electricity generation measured against the "International Definition" came from renewables *(not normalised).*
- 7.0 per cent of electricity sales by licensed suppliers in the UK were from electricity generated from renewables eligible for the Renewables Obligation, up from 6.7 per cent in 2009 *(not normalised).*
- 7.4 per cent of electricity consumption, as measured using the 2009 Renewable Energy Directive methodology, came from eligible renewable sources *(normalised).*
- 6.7 per cent of electricity generation, as measured using the 2001 Renewables Directive methodology, came from eligible renewable sources; if normalisation is used (adopting the 2009 Renewable Energy Directive methodology) the proportion increases to 7.3 per cent.

Data collection and methodology

The UK collection of renewable energy statistics began in 1989, when all relevant renewable energy sources were identified and, where possible, information was collected on the amounts of energy derived from each source. Prior to 2003 data, all wastes were included with renewables, but since then the international definition of total renewables was adopted, and this excludes non-biodegradable wastes.

The database now contains 22 years of data from 1989 to 2010 and this has been used to provide the detailed figures on renewable sources of energy contained within this article and also within the forthcoming 2011 edition of the Digest of UK Energy Statistics, to be published on 28 July 2011.

EU Renewable Energy Directive

In March 2007, the European Council agreed to a common strategy for energy security and tackling climate change. An element of this was establishing a target of 20 per cent of the EU's energy to come from renewable sources by 2020. During 2008 a Directive was negotiated on this basis and resulted in the agreement of country "shares" of this target being included in the final 2009 Renewable Energy Directive. For the UK, 15 per cent of **final energy consumption** - calculated on a net calorific basis, and with a cap on fuel used for air transport - should be accounted for by energy from renewable sources. This Directive super-ceded the 2001 Renewables Directive, which focused on electricity, and allocated the UK a 10 per cent target for the contribution of renewables as a proportion of electricity consumption during 2010. In reporting against this measure, normalised wind and rain is used.

The normalisation approach.

Generation from wind and hydro sources are very dependent on the weather (wind speeds and rainfall). In order to negate the effects of variable generation due to year on year weather differentials, the 2009 Renewable Energy Directive (RED) measure specifies the normalisation of wind and hydro generation. Normalisation is carried out by calculating generation by applying an average load factor to current capacity. For wind, the load factor is calculated as the average of the past five years (including the present one), with current capacity taken as an average of the start and end of year capacity. For hydro, the load factor is the average of the past 15 years, applied to capacity at the end of the current year. The generation figures obtained from this procedure replace the actual generation figures for wind and hydro in the RED calculation. The same method is now also applied to the 2001 Renewables Directive measure.

UK renewables policy

The United Kingdom has a number of measures to increase renewables deployment. These include:

- Putting in place appropriate financial incentives to bring forward and support the take-up of renewable energy, including the "banded" Renewables Obligation (RO), the introduction last year (April 2010) of feed in tariffs (FITs) for small scale electricity generation, and the forthcoming Renewable Heat Incentive (RHI) tariff scheme (for industry, commercial businesses and the public sector) and the RHI Premium Payment Scheme (for households);
- Identifying and removing the most significant non-financial barriers to renewables deployment, including measures to improve existing grid connection arrangements; and
- Overcoming supply chain blockages and promoting business opportunities in the renewables sector in the UK.

The Renewables Obligation

The Renewables Obligation (RO)[1] is an obligation on electricity suppliers to source a specific and annually increasing proportion of electricity from eligible renewable sources or pay a penalty; this is intended to incentivise an increase in the level of renewable generating capacity and so contribute to our climate change targets. Examples of RO eligible sources are listed in Table 1.

The Office for Gas and Electricity Markets (Ofgem), which administers the RO, issues **Renewables Obligation Certificates** (ROCs) to qualifying renewables. These certificates may be sold by generators directly to licensed electricity suppliers or traders. ROCs can be traded separately from the electricity to which they relate. Suppliers present ROCs to Ofgem to demonstrate their compliance with the obligation.

[1] The Renewables Obligation covering England and Wales and the analogous Renewables (Scotland) Obligation came into effect in April 2002. Northern Ireland introduced a similar Renewables Obligation in April 2005.

Table 1: Examples of eligible Renewables Obligation sources of energy	
Wind energy (offshore and onshore)	Geothermal (hot dry rock and aquifers)
Tidal and tidal stream	Anaerobic digestion
Wave energy	Landfill gas and sewage gas
Photovoltaics	Co-firing of biomass with fossil fuel
Energy from waste	Other biomass
Hydro power [excluding hydro power from plants exceeding 20 MW DNC commissioned before 1 April 2002]	Energy crops

When the Obligation was first introduced, 1 ROC was awarded for each MWh of renewable electricity generated. In 2009, 'banding' was introduced into the RO, meaning technologies now receive different numbers of ROCs depending on their costs and potential for large scale deployment. For example offshore wind (1.5 ROCs/MWh), wave and tidal (2 ROCs/MWh), and dedicated energy crops (2 ROCs/MWh). Advanced gasification and pyrolysis, as well as anaerobic digestion, also receive 2 ROCs/MWh. New developments in the more established renewable technologies now receive less support; for example, sewage gas receives 0.5 ROCs/MWh and landfill gas receives 0.25 ROCs/MWh. Following an early review of the banding for offshore wind, the level of support for this technology further increased from 1.5 ROCs/MWh to 2 ROCs/MWh for stations or capacity accredited between 1 April 2010 and 31 March 2014[2]. Onshore wind continues to receive 1 ROC/MWh.

A scheduled banding review commenced in October 2010. It is proposed that new bands will come into effect on 1 April 2013 (with the exception of offshore wind for which new bands will come in on 1 April 2014).

Feed-in Tariffs (FITs)

Feed-in tariffs (FITs) are a financial support scheme for eligible low-carbon electricity technologies, aimed at small-scale installations up to a maximum capacity of 5 Megawatts (MW). FITs support new anaerobic digestion (AD), hydro, solar photovoltaic (PV) and wind projects up to that 5MW limit, by requiring electricity suppliers to make payments (generation tariffs) to generators based on the number of kilowatt hours (kWh) they generate. An additional guaranteed export tariff of 3p per kWh is paid for electricity generated that is not used on site and exported to the grid. The scheme will also support the first 30,000 micro combined heat and power installations with an electrical capacity of 2 kW or less, as a pilot programme.

A comprehensive review of the FITs scheme will conclude at the end of 2011, with changes being implemented in April 2012. However the review of the level of support for solar PV installations above 50 kW and farm scale AD was fast-tracked, and on 9 June 2011 revised tariffs were announced for new solar PV and AD entrants at this scale into the FIT scheme. Any changes implemented as a result of the review will only affect new entrants to the scheme and there is no intention to retrospectively adjust support levels.

Renewable Heat Incentive (RHI)

On 10 March 2011, the Government announced the details of the Renewable Heat Incentive (RHI). For commercial, industrial and community heating, RHI tariffs will start later this year. The incentive is expected to promote the delivery of 57 TWh of renewable heat (equating to 12 per cent of heat coming from new and diversified renewable sources) and save 44 million tonnes of carbon by 2020. For renewable heating in households an RHI premium payment scheme will begin this year until the Green Deal comes in during October 2012, at which point RHI tariffs will begin for the domestic sector too.

[2] This increased level of support will apply to the whole station accredited within the period or to all of the additional capacity accredited in the period. It therefore includes any turbines that form part of the station or the additional capacity, even if some of those turbines are yet to be installed.

Renewable electricity generation

An article in the March 2011 edition of Energy Trends contained provisional estimates for four key measures of the share of electricity obtained from renewable sources. These data have now been revised following receipt of new data, and a fifth measure (the UK Renewable Obligation basis) has been added. All five measures are shown in Table 2. On the "international definition basis" renewables provided 6.8 per cent of the electricity generated in the United Kingdom in 2010, 0.1 percentage points higher than the proportion in 2009. Total electricity generation from renewables in 2010 amounted to 25,734 GWh, an increase of 552 GWh (2.2 per cent) on 2009. Chart 1 shows the growth in the proportion of electricity generation from renewable sources and also progress under the Renewables Obligation (RO), which is measured as a proportion of UK electricity sales; the RO measure grew by 0.3 percentage points to 7.0 per cent in 2010. The normalised electricity component of the 2009 Renewable Energy Directive measure is also shown in this chart, highlighting the impact that low wind speeds and little rain had on renewable electricity generation in 2010.

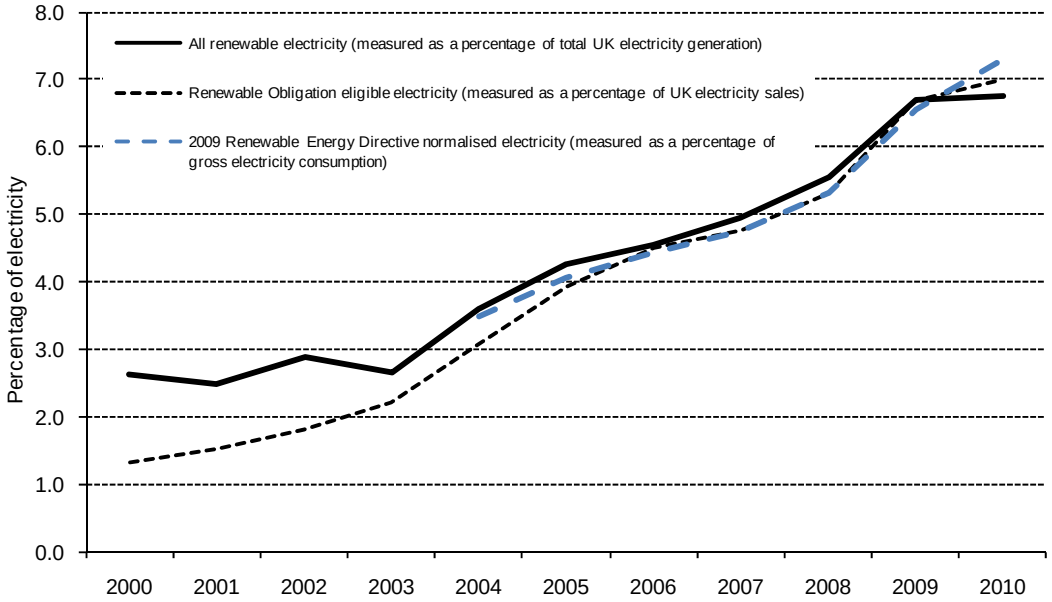
The 2001 EU Renewables Directive measures the renewable contribution of electricity as the proportion of renewable electricity generated (except from non-biodegradable waste) as a percentage of electricity consumption. The 2009 Renewable Energy Directive introduced a fourth measure, which involves normalising wind and hydro generation over 5 and 15 periods respectively, and measuring against gross electricity consumption. An additional fifth measure has also been proposed, applying the above normalising approach to the 2001 Renewables Directive measure. In 2010 the measures which are normalised have shown growth; this is to be expected, given the increase in capacity, as the very low rainfall and wind speeds have been adjusted to take account of the higher load factors during the previous time periods. The normalised Renewables Directive measure increased by 0.7 percentage points to 7.3 per cent, whilst the electricity component of the Renewable Energy Directive increased by 0.8 percentage points, to 7.4 per cent.

Table 2: Percentages of electricity derived from renewable sources

	2005	2006	2007	2008	2009	2010
Overall renewables percentage – International basis (Electricity generated from all renewables except non-biodegradable wastes, as a percentage of all **electricity generated** in the UK)	4.3	4.6	4.9	5.5	6.7	6.8
Percentage on a Renewables Obligation basis (Electricity generated from renewables eligible for the Renewables Obligation - see Table 1 - as a percentage of **electricity sales** by licensed suppliers in the UK)	3.9	4.5	4.8	5.3	6.7	7.0
Percentage on a 2009 Renewable Energy Directive basis (*Normalised* hydro & wind generation combined with actual generation from other sources except non-biodegradable wastes, as a percentage of UK **gross electricity consumption, calculated on a net calorific value basis**)	4.1	4.5	4.8	5.4	6.6	7.4
Percentage on a 2001 Renewables Directive basis (original methodology) (Electricity generated from renewable sources eligible under the 2001 EU Directive - i.e. all renewables except non-biodegradable wastes, as a percentage of UK **electricity demand**)	4.2	4.5	4.9	5.4	6.6	6.7
Percentage on a 2001 Renewables Directive basis (normalised methodology) (*Normalised* hydro & wind generation combined with actual generation from other sources except non-biodegradable wastes, as a percentage of UK **electricity demand**)	4.1	4.4	4.7	5.3	6.6	7.3

The largest increase in generation, both in absolute and percentage terms, came from offshore wind, reflecting the large increase in capacity over the course of the year. Offshore wind generation grew by 75 per cent, from 1,740 GWh in 2009 to 3,046 GWh in 2010. Additionally, co-firing of renewables with fossil fuels increased by 39 per cent, from 1,806 GWh in 2009 to 2,506 GWh in 2010. Other sources showing large increases – but from smaller levels - included plant biomass (an increase of 297 GWh, 27 per cent) and sewage sludge digestion (a 104 GWh, 17 per cent increase). Countering these increases were falls in two of the largest contributors to renewable generation: onshore wind and hydro. Despite increased onshore wind capacity, the low wind speeds experienced for much of the year resulted in onshore wind generation falling by 6 per cent, from 7,564 GWh to 7,137 GWh in 2010. Meanwhile, particularly low rainfall throughout 2010 resulted in the hydro output falling by around one-third on 2009's level, from 5,262 GWh to 3,603 GWh.

Chart 1: Growth in electricity generation from renewable sources since 2000

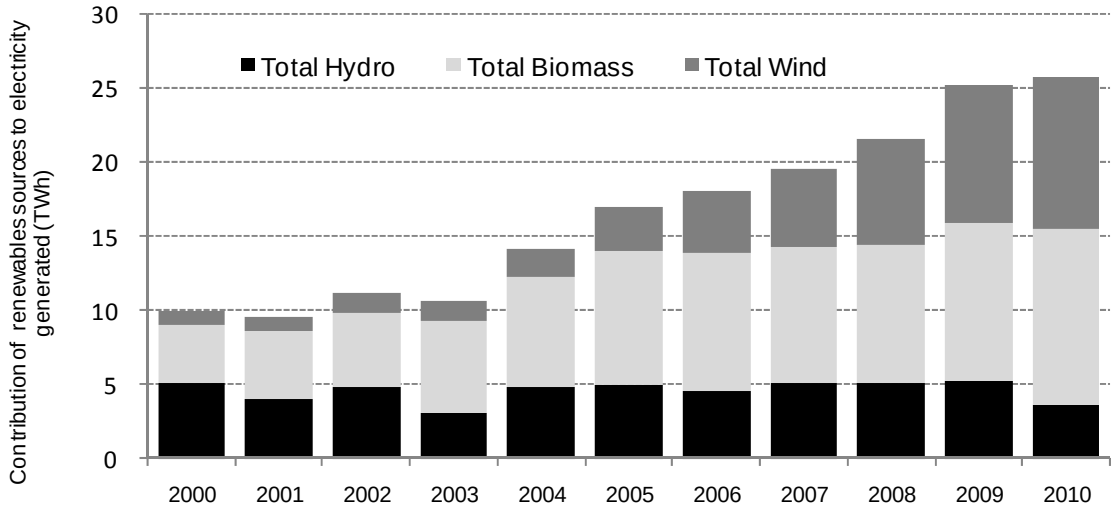


Wind continued to be the leading individual technology for the generation of electricity from renewable sources during 2010 with 40 per cent of renewables generation during 2010 coming from this source; a further 14 per cent came from hydro. However the combined generation from the variety of different biomass sources accounted for 46 per cent of renewable generation, with landfill gas accounting for two-fifths of the biomass generation. Total generation from biomass sources was 12 per cent higher than in 2009, with wind being 9 per cent higher (driven by offshore generation); hydro's contribution was 32 per cent lower. Chart 2 shows the growth in generation, by main renewable source, since 2000.

Renewable electricity capacity

Total renewable electricity capacity at the end of 2010, as shown in Table 5 at the end of this article, amounted to 9.2 GW, compared with 8.0 GW in 2009; this excludes the capacity within conventional generation stations that was used for co-firing (a further 0.4 GW). The main contributors of the 1.2 GW (15 per cent) capacity increase were 553 MW (+16 per cent) from onshore wind, 400 MW (+42 per cent) from offshore wind, 50 MW from solar PV (+190 per cent – as a result of this form of generation being included in the Feed In Tariff scheme) and 43 MW (+11 per cent) from municipal solid waste combustion. In capacity terms, wind was the leading technology in 2010, with hydro second, followed by landfill gas. Fifty eight per cent of renewable electricity capacity in 2010 was from wind, 18 per cent from hydro and 11 per cent from landfill gas. Between April and December 2010, a total of 67.9 MW of capacity was installed via the FIT scheme; around three quarters of the FIT capacity were photovoltaics.

Chart 2: Electricity generation by main renewable source since 2000



Load factors

Load factors are usually calculated in terms of installed capacity, and express the average hourly quantity of electricity generated as a percentage of the average capacity at the beginning and end of the year. A summary of load factors for various technologies during 2008 to 2010 are presented in Table 3. Additional load factors are also shown for onshore and offshore wind, representing the load factors for those wind stations that have operated throughout the calendar year with an unchanged configuration. As mentioned earlier in this article, low wind speeds and rainfall had a major impact on load factors during 2010.

Table 3: Load factors for various renewable technologies

Technology	2008	2009	2010
Onshore wind	27.0%	27.4%	21.7%
Offshore wind	30.4%	26.0%	30.5%
Hydro	37.4%	36.7%	25.0%
Biomass (excluding co-firing and non-biodegradable wastes)	51.1%	54.6%	53.3%
Onshore wind (unchanged configuration basis)	29.4%	26.9%	21.5%
Offshore wind (unchanged configuration basis)	34.9%	33.7%	29.6%

The load factors reported above were partly calculated using data on ROCs produced by Ofgem. Ofgem reconcile their data on a financial year basis at the time that this article was written so the ROC data for 2010 were still provisional. In particular this can have an impact on the schemes included in the unchanged configuration definition as new data could include or remove particular schemes. This should be kept in mind if users subsequently reanalyse these results.

Heat production

Around 16 per cent of renewable sources are used to generate heat. The four sources of renewable heat production in the United Kingdom are the direct combustion of biomass (88 per cent of the total), active solar heating, geothermal aquifers, and heat pumps. Together they produced energy equivalent to 1,212 ktoe in 2010, a 17 per cent increase during the year.

Heat pumps (Air Source and Ground Source) have been included in the statistics for the first time this year, with historic data collected from 2008. Air Source Heat Pumps (ASHP) use an electric driven vapour compression cycle to pump heat from ambient air to the target heating system. Only air to water systems are included in these data and ASHP utilising exhaust air are excluded from these data. A ground source heat pump uses electricity to circulate a mixture of water and antifreeze around a loop of pipe buried underground. Heat from the ground is absorbed into this

fluid and is pumped through a heat exchanger in the heat pump. Low grade heat passes through the heat pump compressor and is concentrated into a higher temperature useful heat capable of heating water for the heating and hot water circuits of the building. Only the net gain in energy (ie total heat energy minus the electricity used to power the pump) is counted as renewable energy. The total number of heat pumps installed was estimated using information from BSRIA, a consultancy and research organisation, and FETA, the trade association for the UK heating and ventilation industry. The renewable heat contribution was calculated assuming that heat pumps installed in 2008 and onwards have a seasonal performance factor (SPF) of 3, and that there was no significant contribution from heat pumps installed before 2008.

Renewables used to generate heat have shown some growth in recent years, following a decline that started more than 10 years ago as a result of tighter emission controls which discouraged on-site burning of biomass, especially wood waste. Further significant growth in this area is anticipated, especially in the industrial and domestic wood use sectors, together with additional heat pumps, as a result of the RHI. Domestic use of wood is the main contributor to renewables used for heat, comprising around 32 per cent of the renewable heat total. Plant biomass (including anaerobic digestion) and non-domestic use of wood (and wood waste) formed the next largest components, at 17 per cent each.

Liquid biofuels for transport

Liquid biofuels for transport comprised around 16 per cent of total renewable sources. Two road transport fuels, biodiesel and bioethanol, are sold blended with diesel and petrol. The Renewable Transport Fuel Obligation (RTFO), introduced in April 2008, placed a legal requirement on transport fuel suppliers (who supply more than 450,000 litres of fossil fuel per annum to the UK market) to ensure that 5 per cent (by volume) of their overall fuel sales are from a renewable source by 2013/14, with incremental levels of 2.5 per cent (by volume) for 2008/09, 3.25 per cent (by volume) in 2009/10, and 3.5 per cent (by volume) in 2010/11. Figures from HM Revenue and Customs based on road fuel taxation statistics show that 1,045 million litres of biodiesel and 631 million litres of bioethanol were consumed in 2010, up from 1,044 million litres and 320 million litres, respectively, in 2009. Biodiesel has a higher energy content than bioethanol meaning that the combined total energy content of these fuels equates to 1,214 ktoe. During 2010 biodiesel accounted for 4.1 per cent of diesel, and bioethanol 3.1 per cent of motor spirit; the combined contribution of biodiesel and bioethanol was 3.6 per cent by volume.

All renewable fuels

When renewables used for transport and heat are combined with the use of renewable sources for electricity generation, renewable sources accounted for 3.6 per cent of the United Kingdom's total primary energy requirements in 2010, up from 3.4 per cent in 2009, and 2.8 per cent in 2008. The trends in the use of renewable energy for transport, heat and electricity are shown in Chart 3; data are shown in table 6 at the end of the article disaggregating the totals by various technologies.

On the basis proposed by Eurostat for measuring progress towards the 2009 Renewable Energy Directive, provisionally in the UK during 2010, 3.3 per cent of final energy consumption was from renewable sources. This is an increase from 3.0 per cent in 2009, and 2.4 per cent in 2008. The Eurostat methodology, as mentioned earlier in this article, measures energy based on a net calorific value basis, as opposed to a gross basis that is generally used in presenting data in Energy Trends and the Digest of UK Energy Statistics. The methodology also includes a cap on energy required for aviation use and normalisation for wind and hydro electricity. In addition to the headline figure, the Directive monitors three constituent parts separately, and these are shown in Table 4. It should be noted that the overall figure is not a simple calculation based around the three constituent parts. The finalised 2010 figures for all member states will be published by Eurostat during 2012.

Table 4: Progress against the 2009 Renewable Energy Directive

	2005	2006	2007	2008	2009	2010
Percentage of electricity from renewable sources	4.1	4.5	4.8	5.4	6.6	7.4
Percentage of heating and cooling from renewable sources	0.9	1.0	1.1	1.5	1.7	1.8
Percentage of transport energy from renewable sources	0.2	0.5	0.9	2.0	2.5	2.9
Overall renewable consumption as a percentage of capped gross final energy consumption using net calorific values	**1.4**	**1.6**	**1.8**	**2.4**	**3.0**	**3.3**

Regional statistics

A further renewable statistics article will be produced in the September 2011 edition of Energy Trends, containing a regional breakdown of the renewable electricity generation and capacity statistics. The data will also be available on the RESTATS website at:
https://restats.decc.gov.uk/cms/regional-renewable-statistics/

Chart 3: Trends in the use of renewable energy for heat, electricity, and transport

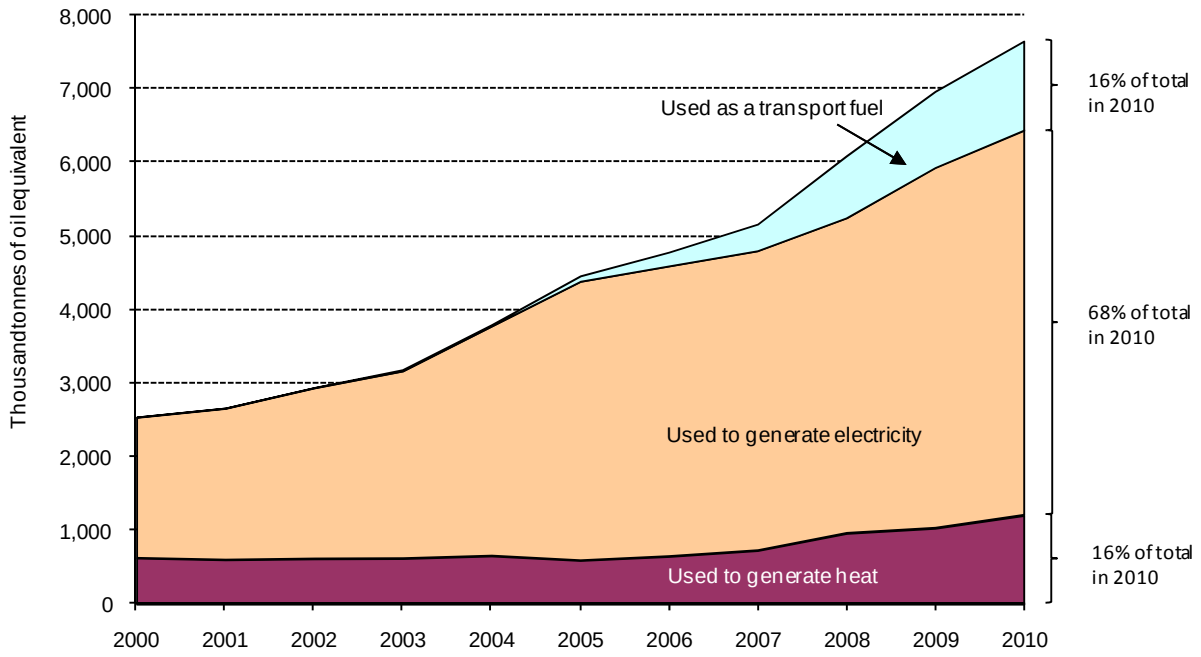


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Table 5: Capacity of, and electricity generated from, renewable sources

	2008	2009	2010
Installed Capacity (MWe)			
Wind:			
Onshore	2,820.2	3,483.2	4,036.7
Offshore *(1)*	586.0	941.2	1,341.2
Shoreline wave / tidal	0.5	2.5	2.6
Solar photovoltaics	22.5	26.5	76.9
Hydro:			
Small scale	173.3	186.3	195.4
Large scale *(2)*	1,456.5	1,458.5	1,452.9
Biomass:			
Landfill gas	908.3	984.9	1,024.6
Sewage sludge digestion	147.6	156.9	189.2
Municipal solid waste combustion	375.9	392.0	435.3
Animal Biomass *(3)*	114.4	119.3	138.6
Plant Biomass *(4)*	197.7	278.5	308.9
Total biomass and wastes	1,743.9	1,931.6	2,096.6
Total	**6,802.9**	**8,029.7**	**9,202.2**
Co-firing *(5)*	226.9	254.7	390.2
Generation (GWh)			
Wind:			
Onshore *(6)*	5,792	7,564	7,137
Offshore *(7)*	1,305	1,740	3,046
Solar photovoltaics	17	20	33
Hydro:			
Small scale	568	598	511
Large scale *(2)*	4,600	4,664	3,092
Biomass:			
Landfill gas	4,757	4,952	5,037
Sewage sludge digestion	532	598	702
Municipal solid waste combustion *(8)*	1,226	1,511	1,594
Co-firing with fossil fuels	1,613	1,806	2,506
Animal Biomass *(3)*	587	620	670
Plant Biomass *(4)*	568	1,109	1,406
Total biomass	9,283	10,596	11,915
Total generation	**21,565**	**25,182**	**25,734**

(1) From 2010, Beatrice (10 MW) has been included as it is now classified as a Major Power Producer , as opposed to solely supplying an offshore oil platform.

(2) Excluding pumped storage stations. Capacities are as at the end of December.

(3) Includes the use of farm waste digestion, anaerobic digestion, poultry litter and meat and bone.

(4) Includes the use of waste tyres, straw combustion, short rotation coppice and hospital waste.

(5) This is the amount of fossil fuelled capacity used for co-firing of renewables based on the proportion of generation accounted for by the renewable source.

(6) Actual generation figures are included where available, but otherwise are estimated using a typical load factor or the design load factor, where known.

(7) Includes electricity from shoreline wave and tidal but in total these amount to less than 2 GWh. Generation by Beatrice is included from 2010 (see note 1) but generation from the EMEC test facility is excluded.

(8) Biodegradable part only.

Table 6: Renewable sources used to generate electricity and heat, and for transport fuels [(1)]

Thousand tonnes of oil equivalent

	2008	2009	2010
Used to generate electricity *(2)*			
Wind:			
Onshore	498.0	650.4	613.7
Offshore *(3)*	112.2	149.6	261.9
Solar photovoltaics	1.5	1.7	2.9
Hydro:			
Small scale	48.8	51.4	44.0
Large scale *(4)*	395.5	401.0	265.9
Biomass:			
Landfill gas	1,560.3	1,624.2	1,652.0
Sewage sludge digestion	174.5	196.2	230.3
Biodegradable municipal solid waste combustion	506.8	624.5	659.0
Co-firing with fossil fuels	528.9	592.3	821.8
Animal Biomass *(5)*	253.3	231.9	259.3
Plant Biomass *(6)*	189.5	367.3	412.3
Liquid biofuels	4.9	-	-
Total biomass	3,218.2	3,636.4	4,034.7
Total	**4,274.3**	**4,890.6**	**5,222.9**
Non-biodegradable wastes *(7)*	310.3	368.6	388.4
Used to generate heat			
Active solar heating	55.7	69.5	87.0
Biomass:			
Landfill gas	13.6	13.6	13.6
Sewage sludge digestion	49.8	51.0	72.8
Wood combustion - domestic	358.6	375.2	391.8
Wood combustion - industrial	220.3	223.4	255.7
Animal Biomass *(8)*	42.4	40.3	45.1
Plant Biomass *(9)*	188.1	203.0	259.0
Biodegradable municipal solid waste combustion	31.5	31.3	25.6
Total biomass	904.2	937.7	1,063.6
Geothermal aquifers	0.8	0.8	0.8
Heat pumps	6.5	28.8	61.0
Total	**967.3**	**1,036.8**	**1,212.4**
Non-biodegradable wastes *(7)*	153.7	140.4	131.5
Renewable sources used as transport fuels			
as Bioethanol	116.3	180.4	355.4
as Biodiesel	728.2	858.1	859.0
Total	**844.5**	**1,038.5**	**1,214.4**
Total use of renewable sources and wastes			
Solar heating and photovoltaics	57.2	71.2	89.8
Onshore and offshore wind *(3)*	610.3	800.0	875.5
Hydro	444.4	452.4	309.8
Biomass	4,122.4	4,574.2	5,098.3
Geothermal aquifers	0.8	0.8	0.8
Heat pumps	6.5	28.8	61.0
Transport fuels	844.5	1,038.5	1,214.4
Total	**6,086.1**	**6,965.9**	**7,649.7**
Non-biodegradable wastes *(7)*	464.1	509.0	520.0
All renewables and wastes	**6,550.2**	**7,474.9**	**8,169.7**

(1) Includes some waste of fossil fuel origin.
(2) For wind, solar PV and hydro, the figures represent the energy content of the electricity supplied but for biomass the figures represent the energy content of the fuel used.
(3) Includes electricity from shoreline wave and tidal, but these amount to less than 0.2 ktoe, excluding generation from EMEC.
(4) Excluding pumped storage stations.
(5) Includes electricity from farm waste digestion, anaerobic digestion, poultry litter combustion and meat and bone combustion.
(6) Includes the use of straw combustion and energy crops.
(7) Non-biodegradable part of municipal solid waste plus waste tyres, hospital waste, and general industrial waste.
(8) Includes heat from farm waste digestion, meat and bone combustion and sewage sludge combustion.
(9) Includes heat from straw, energy crops, paper and packaging.

Sub-national road transport fuel consumption statistics for 2009 and analysis of national trends in diesel and petrol use

Introduction

This article presents the latest estimates of road transport fuel consumption at both Regional and Local Authority level. The dataset has been produced for DECC by AEA, and was calculated using the same methodology used to estimate total UK emissions for the road transport sector in the National Atmospheric Emission's Inventory (NAEI) / Greenhouse Gas Inventory. The data in this article relate to 2009; however to provide a comparable time series, data for years 2005 to 2008 have been revised to incorporate the latest methodological developments.

This work forms part of a wider project that started in 2003 to improve local area energy data, to meet increasing user needs. This information on road transport fuels in 2009 complements three other data sets on regional and local use of energy for the same year: gas and electricity consumption data, which were published in December 2010, and estimates for consumption of residual fuels[1], which will be released later this year.

All sub-national datasets are available at:
www.decc.gov.uk/en/content/cms/statistics/regional/regional.aspx

Methodology

To produce these 2009 estimates, the NAEI Road Transport Inventory methodology was used. This methodology combines traffic activity data (from the Department for Transport's (DfT) national traffic census) with fleet composition data (vehicle mix by engine size, vehicle size, age, engine and exhaust treatment technology, Euro emission standards and fuel type), based on licensing data from DfT and fuel consumption/emission factors produced by the Transport Research Laboratory.

The resulting estimates are based on the location at which the fuel was consumed rather than the place where the fuel was purchased. On this basis, AEA have estimated road transport consumption at Local Authority level based on the traffic and road type data and point measurements from traffic counters. Data are then aggregated and published by vehicle type within each Local Authority.

Due to the NAEI continuous improvement programme, AEA have further developed the methodology since the previous publication in 2010. This is in line with improved knowledge and understanding of the factors that affect consumption and also to incorporate more accurate and detailed data.

The major changes to the methodology are:

- An update on the assumption used to split buses and coaches on urban and rural road;
- The incorporation of more detailed breakdown in the activity of 2-stroke and 4-stroke motorcycles;
- Updated vehicle km activity data by road types in Great Britain;
- Revisions to the vehicles km activity data for cars, LGVs and rigid HGVs in Northern Ireland.

More detailed information on the methodology can be found in the accompanying guidance note at the website address above.

[1] These are defined as non-gas, non-electricity and non-road transport use but exclude fuel used for aviation and national navigation.

Limitations and definitions

As the data are modelled, there are a number of uncertainties affecting the accuracy of these estimates at Local Authority level. These uncertainties mainly reflect the uncertainties in the vehicle kilometre data (traffic census, DfT) and fleet composition data, affecting the consumption factors calculated for each vehicle type.

The uncertainties in allocating consumption to individual Local Authorities are mainly due to local variations in the national fleet in terms of the vehicle age and fuel mix. For example, traffic in some areas can be made by higher proportion of diesel or older cars than in other areas.

Areas where there is frequently congested urban traffic and those with high levels of heavy duty vehicle traffic are considered to be more uncertain, in comparison to areas where traffic is normally free-flowing. Rural areas dominated by smaller towns are considered to have the lowest levels of uncertainty.

It also should be noted that the estimates exclude consumption of LPG and biofuels and all references to petrol and diesel in this article exclude bioethanol and biodiesel respectively.

The total UK consumption figure for road transport fuels with the values as summed up from the LA dataset for 2009 is 35,411 thousand tonnes of fuel. Total UK road transport consumption figure derived from the NAEI methodology is 1.1 per cent lower than the equivalent total of petrol and diesel (DERV) in the Digest of UK Energy Statistics (DUKES) - 35,819 thousand tonnes. The DUKES value also includes a small amount of petrol and diesel consumed by off-road vehicles and machinery (e.g. portable generators, lawn mowers) and consumption in the Crown Dependencies (Jersey, Guernsey and Isle of Man).

A report containing a more detailed description of the methodology behind these estimates is available from the 'Related Documents' section at:
www.decc.gov.uk/en/content/cms/statistics/regional/road_transport/road_transport.aspx

Regional and local estimates

Table 1, at the end of this article, presents estimates of road transport fuel consumption for Scotland, Wales, Northern Ireland and the regions of England for 2009. The table also includes four local authorities from each region showing the highest and lowest personal (defined as buses, diesel cars, petrol cars and motor cycles) and freight (defined as HGV, diesel LGV and petrol LGV) consumption levels. Consumption is also shown separately for cars, buses, motor cycles, HGVs and LGVs.

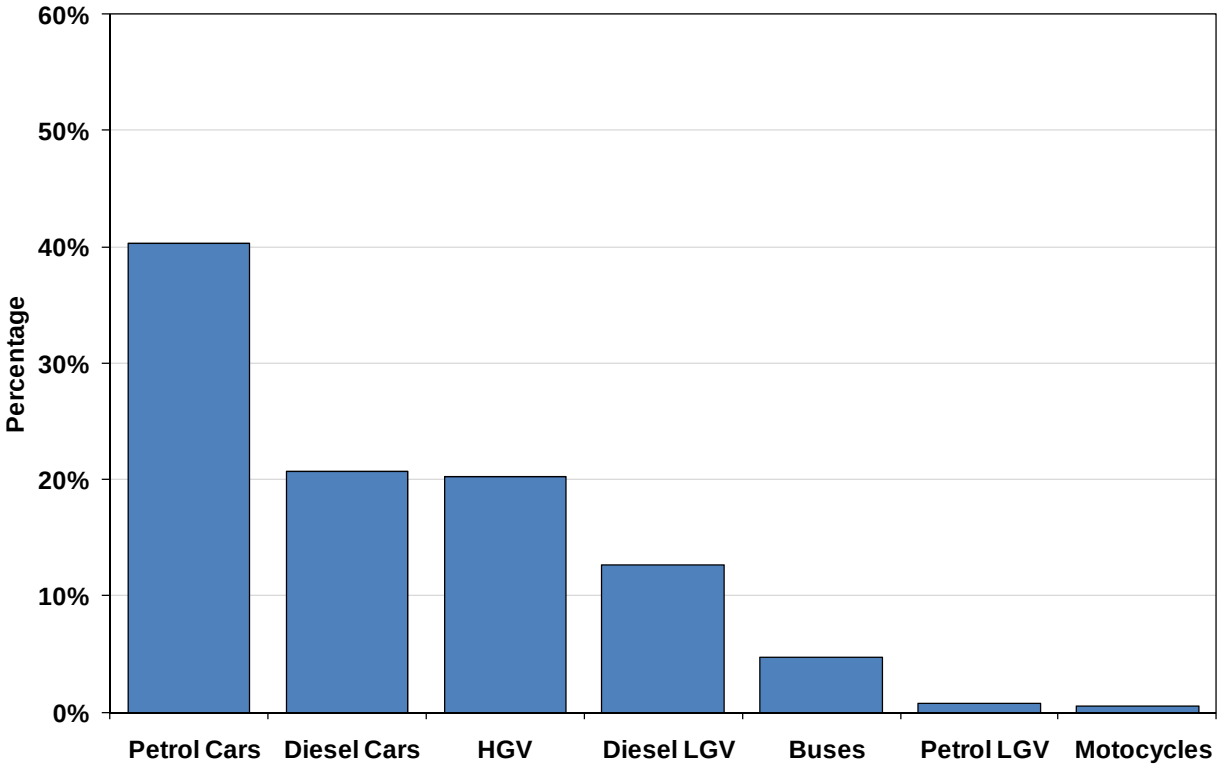
The full tables showing road transport fuel consumption for all LAU1[2] (formerly NUTS4) areas in the United Kingdom for 2002 to 2009 are available on the DECC Energy Statistics website at:
www.decc.gov.uk/en/content/cms/statistics/regional/road_transport/road_transport.aspx.
However, as noted above, the data prior to 2005 are produced using a different methodology, therefore it is not recommended that data for 2002 to 2004 are compared with later data.

[2] Local Administrative Units (LAU) is a hierarchical classification of spatial units that provides a comparable breakdown of the European Union's territory for producing regional statistics. Formerly known as NUTS4, LAU1 refers to the 354 individual London boroughs/metropolitan districts/unitary authorities/local authority districts in England, 22 individual unitary authorities in Wales, 41 individual or groups of whole/part unitary authorities and/or local enterprise company areas in Scotland, and 26 individual district unitary authorities in Northern Ireland, totalling 443 UK LAU1 regions. LAU1 areas in Scotland do not match exactly the Local Authority Areas and there are more LAU1 areas in Scotland than Local Authorities. In the analysis, Scottish Local Authorities are used in place of LAU1 giving 434 local areas in the UK.

Preliminary analyses of road transport fuel consumption

Chart 1 shows the distribution of total UK road transport fuels (35,411 thousand tonnes) by vehicle type in 2009[3]. Cars were estimated to be responsible for 61 per cent of total road transport fuel consumption in 2009, with 34 per cent being used by HGVs and LGVs for freight and the remaining 5 per cent being used by buses and motorcycles.

Chart 1: Fuel use by vehicle type, UK, 2009

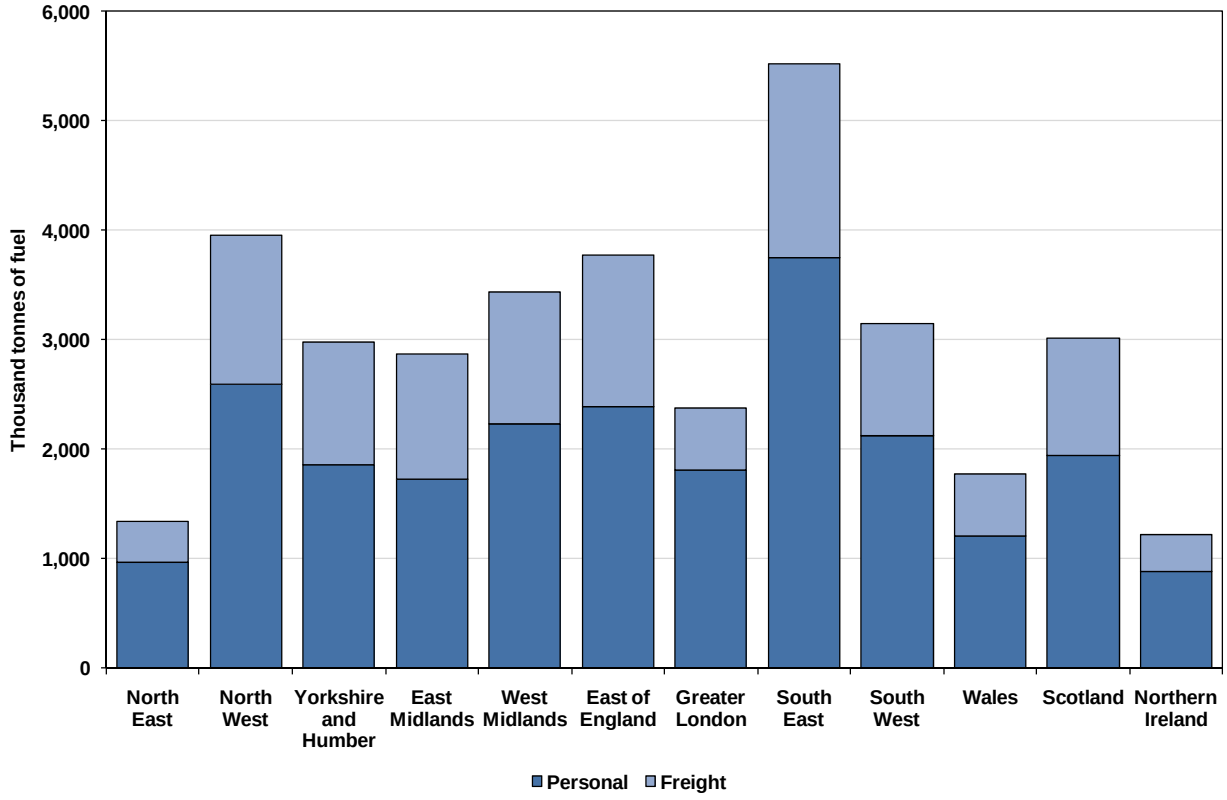


At a sub-national level, as illustrated in Chart 2, the North East of England and Northern Ireland had the lowest consumptions of transport fuels for both personal travel and freight, whilst the highest consumption levels occurred in the South East of England. The local authorities with the highest total consumption were Leeds (436 thousand tonnes of fuel) and Birmingham (404 thousand tonnes of fuel), mainly because of the concentration of major motorways in these areas.

[3] It should be noted that figures quoted from this analysis are based directly on the "bottom-up" methodology combining fuel consumption factors and local area traffic flow data. The breakdown in fuel consumption and CO_2 emissions by vehicle type quoted in other Government Statistics produced by DECC and DfT are slightly different as these apply a normalization procedure to bring the estimates in line with fuel consumption data reported in DUKES, following the requirements of international reporting of greenhouse gas emissions from transport sources according to fuel sales.

In the UK personal travel accounted for 66 per cent of the fuel consumed. However, the percentage of fuel consumed for personal travel varied between regions; from 60 per cent in the East Midlands to 76 per cent in Greater London. The variation seen is a partial reflection on the road class mix within a region. Fuel consumption from personal travel in the South East was higher than total consumption in all regions with the exception of the North West and the East of England.

Chart 2: Fuel used for freight and personal road transport by region, 2009



Time series analysis

Now that data exists for five consecutive and comparable years (2005 to 2009 inclusive), it is interesting to look at some of the trends in road transport fuel use that are emerging over this period. It is important to note that, as these figures refer to consumption of petrol and diesel, the trends partly reflect national changes in consumption and growth in consumption of bioethanol and biodiesel which has displaced some petrol/DERV in recent years through blending. However replacements rates differ between the fuel types, with biodiesel representing 4.2 per cent of the total DERV delivered in 2009, whilst bioethanol represented 1.4 per cent of the total motor spirit.

Chart 3 shows the inverse relationship in consumption between petrol cars and diesel cars over the period 2005 to 2009, when consumption by petrol cars fell 2,765 thousand tonnes of fuel (16 per cent), and consumption by diesel cars increased by 1,153 thousand tonnes of fuel (19 per cent). This reflects the shift away from petrol use, and towards diesel use. Total fuel consumption by cars in 2009, was 7 per cent (1,617 thousand tonnes of fuel) lower than in 2005. Chart 4 combines the two fuel types.

Meanwhile, for freight transport, there was an overall decrease of 3 per cent (340 thousand tonnes) in fuel consumed between 2005 and 2009. However, as seen in Chart 6, there was actually an increase of 5 per cent in fuel consumed for freight transportation between 2005 and 2007, followed by a decrease of 8 per cent between 2007 and 2009. This decrease can mainly be attributed to the start of the recessionary period, which saw a fall in the amount of freight being transported around the UK.

Chart 3: Fuel consumed by diesel cars and petrol cars, UK, 2005 to 2009

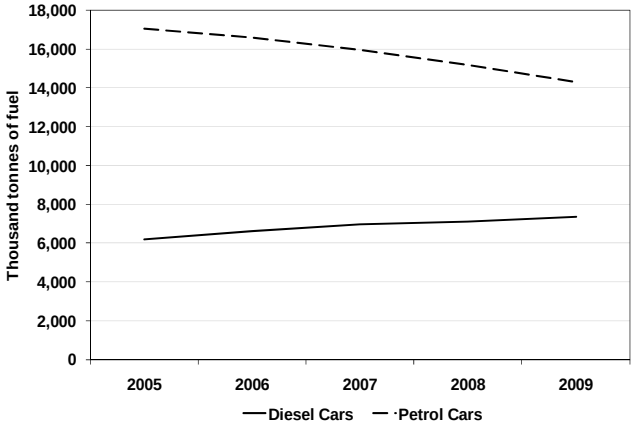
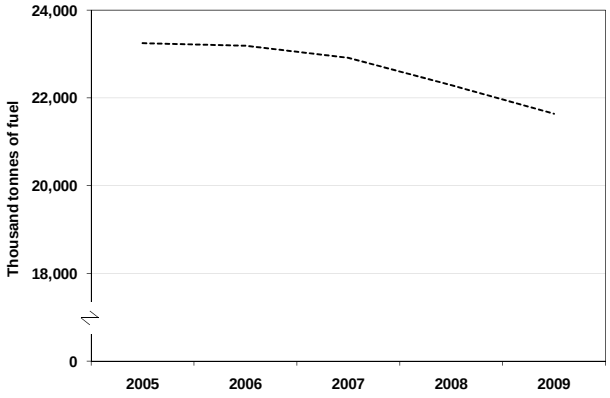


Chart 4: Fuel consumed by cars (diesel and petrol combined), UK, 2005 to 2009



Looking at trends by fuel type, fossil fuel petrol consumption decreased by 16.3 per cent (2,878 thousand tonnes of fuel) between 2005 and 2009, while diesel consumption increased by 4.5 per cent (880 thousand tonnes of fuel) over the same period reflecting the increasing use of diesel cars (note that in this analysis we assume that HGVs and buses solely use diesel, whereas motorcycles solely use petrol). Looking at a sub-national level, it is the case that, in every English region and Devolved Administration (DA) of Scotland, Wales and Northern Ireland, the use of petrol has decreased over the five year period, while the use of diesel has increased.

Chart 5: Fuel consumed by road freight vehicle type, UK, 2005 to 2009

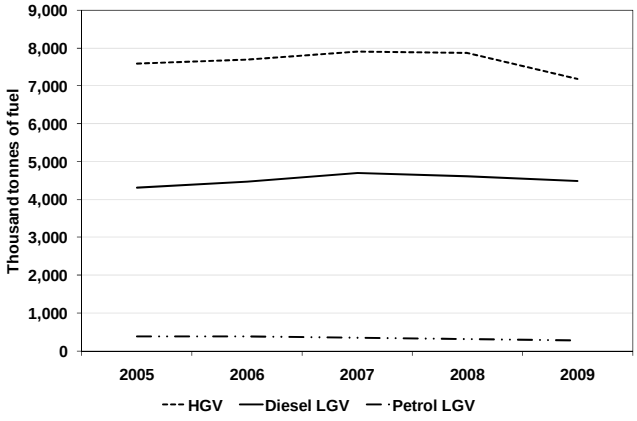


Chart 6: Fuel consumed by road freight transport, UK, 2005 to 2009

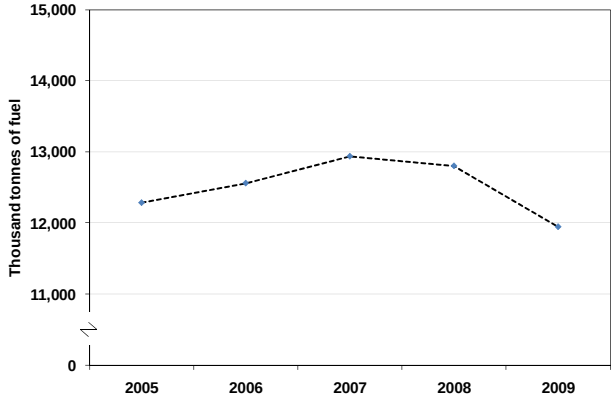
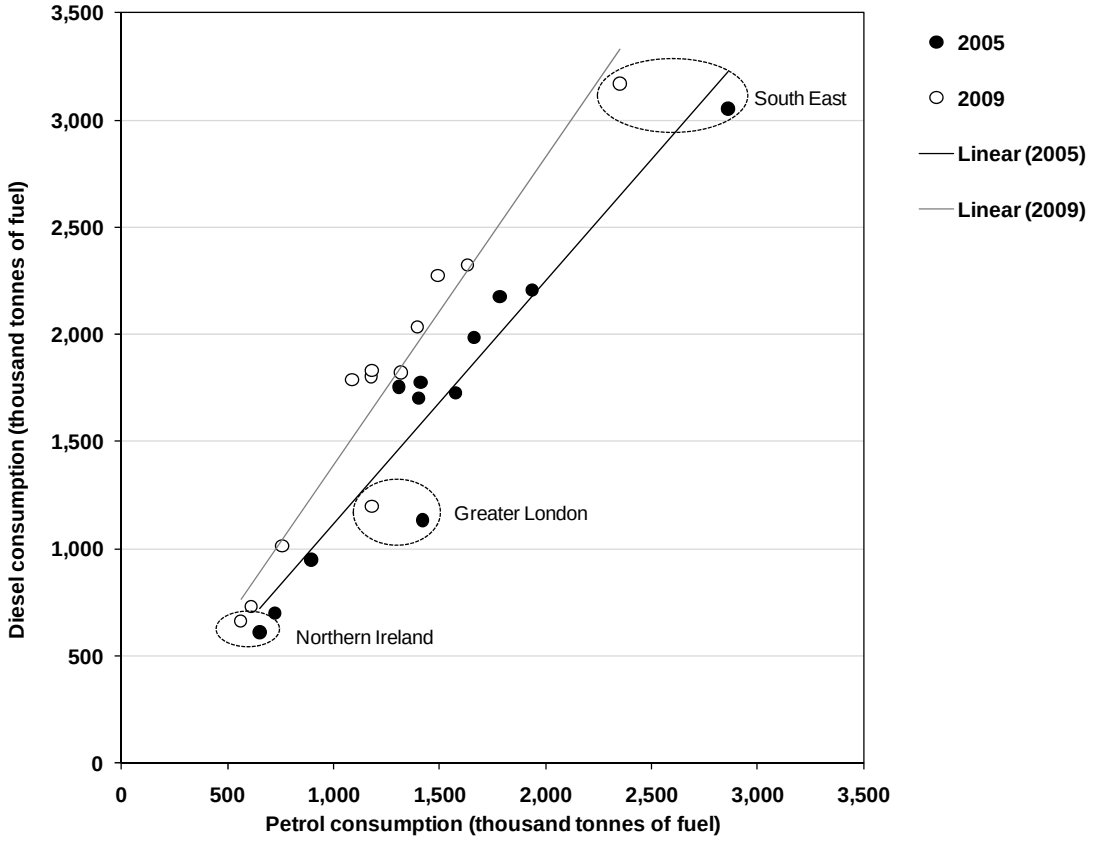


Chart 7 shows a scatter diagram depicting the relationship between petrol consumption and diesel consumption in each of the regions and the DAs for both 2005 and 2009. In both of these years, there is clearly a positive relationship between the amounts of petrol and diesel consumed, in other words, the greater the petrol use, the greater the diesel use (and vice versa).

Chart 7: Petrol and diesel consumption in each region in 2005 and 2009



These relationships between petrol and diesel consumption (in terms of thousand tonnes of fuel) in 2005 and 2009 can be expressed as linear models and are shown below.

2005: Diesel consumption = (1.1328*Petrol consumption) -16.35

2009: Diesel consumption = (1.4337*Petrol consumption) - 41.44

R-squared values are a measure of how well a model (in this case the linear relationship) fits the raw data. They range from 0 to 1, with an R-squared value of 1 indicating that the model is a perfect fit and hence if the value of one variable is known, the other one can be predicted perfectly. An R-squared value of 0 implies that the model is effectively useless as there is no identifiable relationship between the variables.

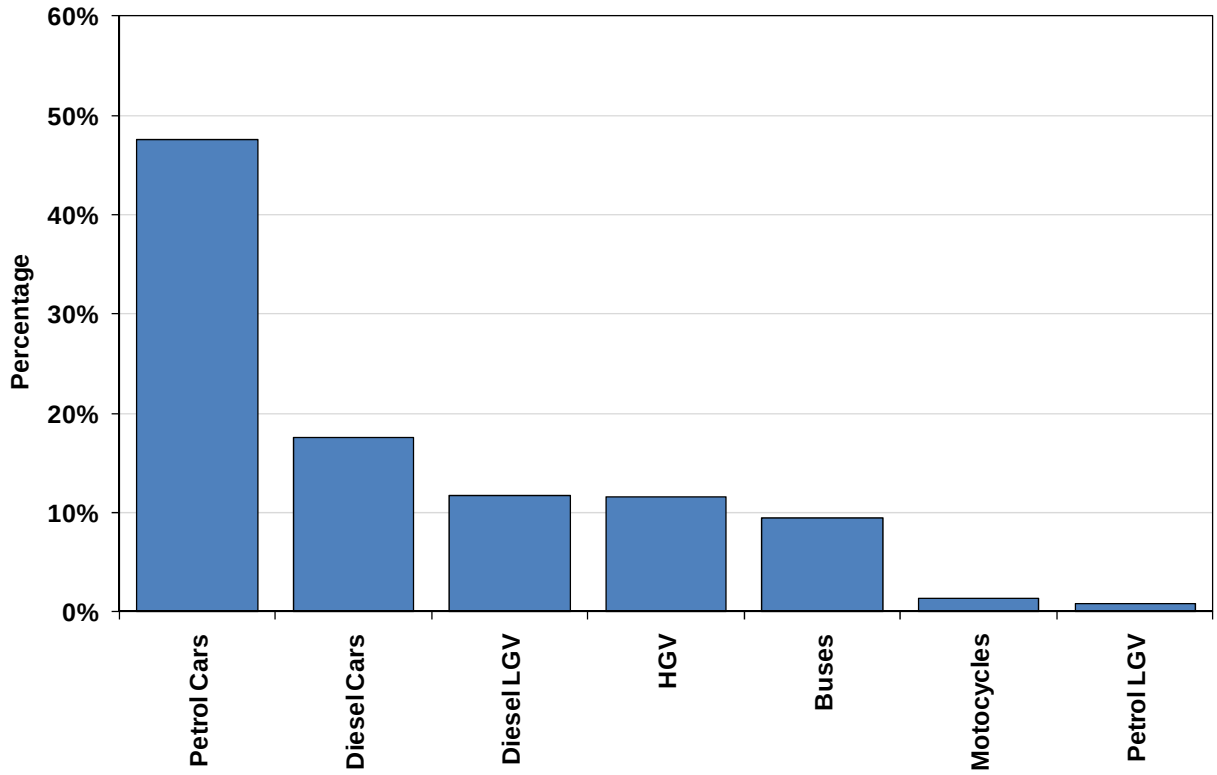
The R-squared values for the models depicted in Chart 7 are 0.927 and 0.9177, for 2005 and 2009 respectively, indicating that the models are a good fit for the data[4]. The change in parameter values seen between 2005 and 2009 reflect the increased diesel consumption and decreased petrol consumption seen over this time period.

The outlier (i.e. where the model does not fit the data) in both 2005 and 2009 is the region of Greater London, where there is a relatively high petrol consumption compared to diesel consumption.

[4] A relationship might be expected due to the nature of the modelling methodology used to derive these data.

Chart 8 shows the share by transport type of the 2,379 thousand tonnes of fuel used for road transport in 2009 in the Greater London region. Compared to the UK as a whole (see Chart 1), a greater proportion of the use is attributed to petrol cars (48 per cent compared to 40 per cent for the UK). At the same time, the proportions of fuel used by HGVs (12 per cent) and by diesel cars (17 per cent) in Greater London are lower than the proportions for the UK as a whole (20 per cent and 21 per cent for HGVs and diesel cars respectively).

Chart 8: Fuel use by transport type in Greater London, 2009



Acknowledgements

DECC would like to thank Ioannis Tsagatakis and his team at AEA for their work on improving and producing this dataset.

User feedback

We welcome all feedback from the users of this data, therefore if you would like to comment on these or on the content of this article, please contact Will Rose using the details below.

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Table 1: Selected regional and local road transport consumption statistics: 2009

Thousand tonnes of fuel

English Regions and Devolved Administration Regions and selected Local Authorities	Buses	Diesel Cars	Petrol Cars	Motorcycles	HGV	Diesel LGV	Petrol LGV	Personal [1]	Freight [2]	Total
Gateshead	11.7	25.2	61.9	0.5	16.8	16.4	1.1	99.3	34.2	133.5
Sunderland	11.7	24.7	60.8	0.4	13.7	16.0	1.1	97.6	30.7	128.4
Alnwick	1.0	4.5	7.5	0.1	4.7	3.0	0.2	13.0	7.9	20.9
Wansbeck	2.1	4.1	8.9	0.1	1.7	2.3	0.1	15.3	4.2	19.4
Total North East	**106.8**	**263.2**	**595.8**	**4.9**	**194.6**	**168.5**	**10.8**	**970.7**	**373.9**	**1,344.6**
Warrington	5.7	38.2	65.8	0.5	60.0	19.8	1.2	110.2	81.0	191.2
Manchester	14.2	38.1	89.1	0.8	23.5	20.3	1.4	142.2	45.2	187.4
Copeland	1.6	5.0	10.0	0.2	3.0	3.0	0.2	16.8	6.3	23.1
Barrow-in-Furness	1.4	2.6	6.4	0.1	1.5	1.6	0.1	10.6	3.2	13.8
Total North West	**184.1**	**807.6**	**1,588.7**	**15.3**	**878.6**	**452.4**	**28.6**	**2,595.8**	**1,359.7**	**3,955.4**
Leeds	19.6	86.2	179.6	1.6	89.8	55.3	3.5	287.1	148.6	435.7
Doncaster	9.5	40.9	79.4	0.9	83.5	27.4	1.7	130.7	112.6	243.4
Scarborough	3.2	10.3	21.3	0.4	5.3	6.8	0.4	35.2	12.5	47.7
Craven	1.8	9.0	15.7	0.2	8.2	5.3	0.3	26.8	13.8	40.6
Total Yorkshire and the Humber	**131.6**	**566.2**	**1,141.7**	**13.2**	**726.7**	**380.6**	**24.0**	**1,852.7**	**1,131.3**	**2,984.0**
South Northamptonshire	2.9	32.2	45.2	0.4	57.3	19.0	1.1	80.8	77.3	158.1
Daventry	2.6	28.1	41.5	0.4	62.1	18.7	1.1	72.7	81.9	154.6
Lincoln	1.4	3.2	7.9	0.2	2.5	2.2	0.1	12.7	4.8	17.5
Oadby and Wigston	1.2	2.3	6.6	0.1	1.0	1.4	0.1	10.2	2.5	12.7
Total East Midlands	**101.6**	**558.6**	**1,052.6**	**12.9**	**763.7**	**363.7**	**22.0**	**1,725.6**	**1,149.5**	**2,875.1**
Birmingham	31.1	77.3	200.5	1.8	44.5	46.1	3.2	310.7	93.7	404.5
North Warwickshire	3.1	36.9	49.4	0.4	64.8	22.5	1.2	89.8	88.5	178.4
Oswestry	1.3	4.2	7.4	0.1	5.2	3.1	0.2	13.1	8.4	21.5
Tamworth	1.7	3.9	10.3	0.1	2.4	2.4	0.2	15.9	4.9	20.8
Total West Midlands	**166.9**	**692.5**	**1,356.4**	**13.5**	**747.8**	**426.9**	**26.6**	**2,229.3**	**1,201.3**	**3,430.6**
Huntingdonshire	4.0	37.1	61.2	0.7	72.6	24.7	1.4	103.1	98.7	201.8
Epping Forest	4.5	37.3	54.2	0.8	58.1	24.3	1.4	96.7	83.8	180.5
Maldon	1.2	6.6	12.2	0.2	3.1	4.3	0.3	20.2	7.7	27.9
Watford	1.7	5.5	14.1	0.2	2.5	3.2	0.2	21.5	5.9	27.3
Total East of England	**138.1**	**782.2**	**1,442.4**	**19.4**	**834.5**	**520.3**	**31.5**	**2,382.1**	**1,386.3**	**3,768.4**

Thousand tonnes of fuel

English Regions and Devolved Administration Regions and selected Local Authorities	Buses	Diesel Cars	Petrol Cars	Motorcycles	HGV	Diesel LGV	Petrol LGV	Personal [1]	Freight [2]	Total
Hillingdon	10.4	32.9	74.6	1.2	18.2	16.1	1.1	119.1	35.3	154.4
Havering	5.9	21.6	46.3	0.8	32.4	13.0	0.8	74.6	46.2	120.8
Islington	5.8	5.9	17.6	1.0	3.3	5.5	0.4	30.3	9.2	39.5
City of London	2.3	2.4	7.5	0.6	1.4	2.4	0.2	12.8	4.0	16.7
Total Grater London	**225.5**	**416.3**	**1,130.9**	**31.2**	**276.7**	**279.1**	**19.8**	**1,803.9**	**575.5**	**2,379.4**
West Berkshire	4.9	51.6	74.8	0.8	60.0	24.5	1.4	132.1	85.9	218.0
Cherwell	3.6	40.2	61.0	0.7	49.9	21.1	1.2	105.5	72.2	177.7
Hastings	1.7	4.0	11.3	0.2	1.3	2.5	0.2	17.1	4.0	21.2
Gosport	1.2	3.2	9.1	0.2	0.9	2.0	0.1	13.7	3.1	16.8
Total South East	**180.4**	**1,265.5**	**2,273.3**	**32.4**	**973.5**	**750.7**	**45.4**	**3,751.7**	**1,769.7**	**5,521.3**
South Gloucestershire	8.3	58.2	93.7	1.5	65.3	31.9	1.9	161.7	99.1	260.8
North Somerset	5.5	35.5	58.0	0.9	29.6	19.6	1.2	100.0	50.3	150.3
Weymouth and Portland	1.9	3.7	9.6	0.2	1.4	2.3	0.2	15.4	3.9	19.4
Isles of Scilly	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2
Total South West	**130.7**	**695.0**	**1,270.6**	**21.7**	**568.3**	**428.9**	**26.2**	**2,118.0**	**1,023.4**	**3,141.4**
Cardiff	8.8	39.3	90.0	0.7	24.3	19.9	1.3	138.9	45.5	184.4
Rhondda, Cynon, Taff	5.8	29.4	56.0	0.5	17.8	17.7	1.1	91.7	36.6	128.2
Merthyr Tydfil	1.0	5.7	11.1	0.1	3.7	3.8	0.2	17.9	7.7	25.6
Blaenau Gwent	1.0	5.3	10.0	0.1	3.4	3.0	0.2	16.3	6.5	22.8
Total Wales	**80.8**	**387.7**	**734.3**	**8.5**	**296.8**	**250.4**	**15.3**	**1,211.3**	**562.5**	**1,773.8**
Glasgow City	16.4	49.0	99.8	0.6	38.6	28.5	1.9	165.8	68.9	234.8
North Lanarkshire	14.0	38.6	86.5	0.5	46.6	27.6	1.8	139.7	75.9	215.6
Shetland Islands	0.9	2.6	4.3	0.1	1.9	2.4	0.1	7.7	4.5	12.2
Orkney Islands	0.7	1.9	3.1	0.0	1.3	1.6	0.1	5.8	2.9	8.7
Total Scotland	**189.6**	**596.5**	**1,146.4**	**11.2**	**655.4**	**389.7**	**24.1**	**1,943.7**	**1,069.2**	**3,012.9**
Belfast	2.2	20.1	48.1	0.6	20.3	3.1	0.2	71.0	23.7	94.7
Lisburn	1.3	22.5	37.3	0.4	19.2	4.3	0.3	61.4	23.8	85.2
Moyle	0.3	5.5	9.0	0.1	3.1	1.1	0.1	14.8	4.2	19.1
Carrickfergus	0.2	2.8	6.4	0.1	1.6	0.6	0.0	9.5	2.3	11.7
Total Northern Ireland	**16.5**	**309.2**	**553.2**	**4.6**	**263.9**	**72.0**	**4.4**	**883.5**	**340.4**	**1,223.8**
Great Britain	**1,635.9**	**7,031.2**	**13,733.3**	**184.3**	**6,916.6**	**4,411.3**	**274.3**	**22,584.7**	**11,602.2**	**34,186.9**
United Kingdom	**1,652.4**	**7,340.4**	**14,286.4**	**188.9**	**7,180.5**	**4,483.3**	**278.7**	**23,468.2**	**11,942.6**	**35,410.7**

(1) Personal travel includes buses, diesel cars, petrol cars and motor cycles.
(2) Freight includes HGV, diesel LGV and petrol LGV.

National Energy Efficiency Data framework

Introduction

The National Energy Efficiency Data framework (NEED) is a project set up by the Department of Energy and Climate Change (DECC) to develop its understanding of energy use and the impact of energy efficiency measures. It brings together energy consumption data at property level and matches this with property attribute data and records of energy efficiency measures installed[1].

An initial report on this analysis focusing on the domestic (household) sector was published on 30 June 2011. It presents a wide range of results about how energy use changes as dwelling or household characteristics (such as property type or number of bedrooms) alter. It also shows that energy efficiency investment in homes can reduce energy consumption and how those savings can vary by property type. The report also highlights a variety of questions for further analysis.

The report and supplementary data tables can be downloaded from the DECC website at: www.decc.gov.uk/en/content/cms/statistics/energy_stats/en_effic_stats/en_effic_stats.aspx.

Purpose of NEED

Improving the evidence base on energy efficiency is a major aim for DECC. It benefits energy consumers to understand how energy can be saved both through investment in energy efficiency and through understanding more about the impacts of household attributes (e.g. number of bedrooms) on energy use. It provides DECC with evidence for policy design and in future will allow more detailed monitoring of policies. It will benefit providers of energy efficiency measures in understanding more about what savings can be realised. The analysis undertaken so far has demonstrated that the installation of energy efficiency measures has led to significant energy savings for real households.

This analysis is being used to support the development of key DECC policies including the Green Deal[2] alongside other evidence including scientific studies of what technologies save in field trials. The evidence in this report focuses on savings from real households and produces new understanding of the range of observed savings.

Main types of analysis in initial report

The initial report covers analysis of the domestic sector in three main areas:

- How take up of energy efficiency measures has varied between types of property and household.
- Statistical comparisons of gas and electricity consumption in 2008 by property and household types.
- Analysis of the savings made by households that have installed energy efficiency measures (for example cavity wall insulation or condensing boilers).

Some examples of findings in the report include:

- There is a strong relationship between median energy consumption and number of bedrooms. Consumption per bedroom is lower for three bedroom properties than for one or two bedroom homes for both gas and electricity but beyond three bedrooms there are very small savings per bedroom with each additional bedroom adding roughly 5,400 kWh of gas and 1,200 kWh of electricity to household consumption.

[1] Information on energy efficiency measures installed is taken from the Homes Energy Efficiency Database (HEED): www.energysavingtrust.org.uk/business/Business/Information/Homes-Energy-Efficiency-Database-HEED

[2] www.decc.gov.uk/en/content/cms/tackling/green_deal/green_deal.aspx

- Analysis of energy consumption by income group quantifies the extent to which higher income households have both higher median consumption and a greater range of consumption for both gas and electricity. The median consumption of the highest income group (>£75,000) was nearly double that of the lowest income group (<£10,000).
- Homes receiving cavity wall insulation used around 2,200 kWh less gas than the those who did not receive a measure, based on analysis of median changes in gas consumption for homes receiving energy efficiency measures in 2006 relative to a control group.

The report also compares the NEED analysis with similar analysis published in the British Gas Home Energy Report3 produced by the Centre for Economics and Business Research (CEBR). The British Gas Home Energy Report used a similar methodology to NEED looking at consumption data and energy efficiency measures for British Gas customers but did not cover the impact of a control group.

Further development of NEED analysis

All results in the intial report relate to the domestic sector in England, however the NEED project also covers the whole of Great Britain for both the domestic and non-domestic sectors. The non-domestic sector is considerably more complex than the domestic sector and work to examine the use of this framework to improve understanding of non-domestic energy consumption is still ongoing.

DECC is encouraged by the analysis that has already been possible from the creation of NEED. This ambitious project has successfully demonstrated meaningful results and filled key gaps in the evidence of how energy is used in homes and what the observed impacts are of key energy efficiency measures. This will enable DECC to make better estimates of what measures will save for future policies and start to look at related issues such as comfort taking. Econometric analysis is also currently underway to quantify determinants of energy consumption.

Given the success of these initial findings, DECC will carry out further analysis of these data and look to expand the analysis to look at additional measures such as solid wall insulation and using the data framework to develop analysis of non-domestic energy consumption. DECC will continue to seek additional datasets to include in NEED to increase its analytical potential.

Acknowledgements

DECC would like to thank energy suppliers for allowing their data to be used in this project, the Energy Saving Trust (EST) for providing access to HEED and the Valuation Office Agency (VOA) for development of the sample and property attribute data.

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[3] www.cebr.com/wp-content/uploads/British-Gas-Home-Energy-Report-2011.pdf

Temperature adjustment of primary energy consumption

Introduction

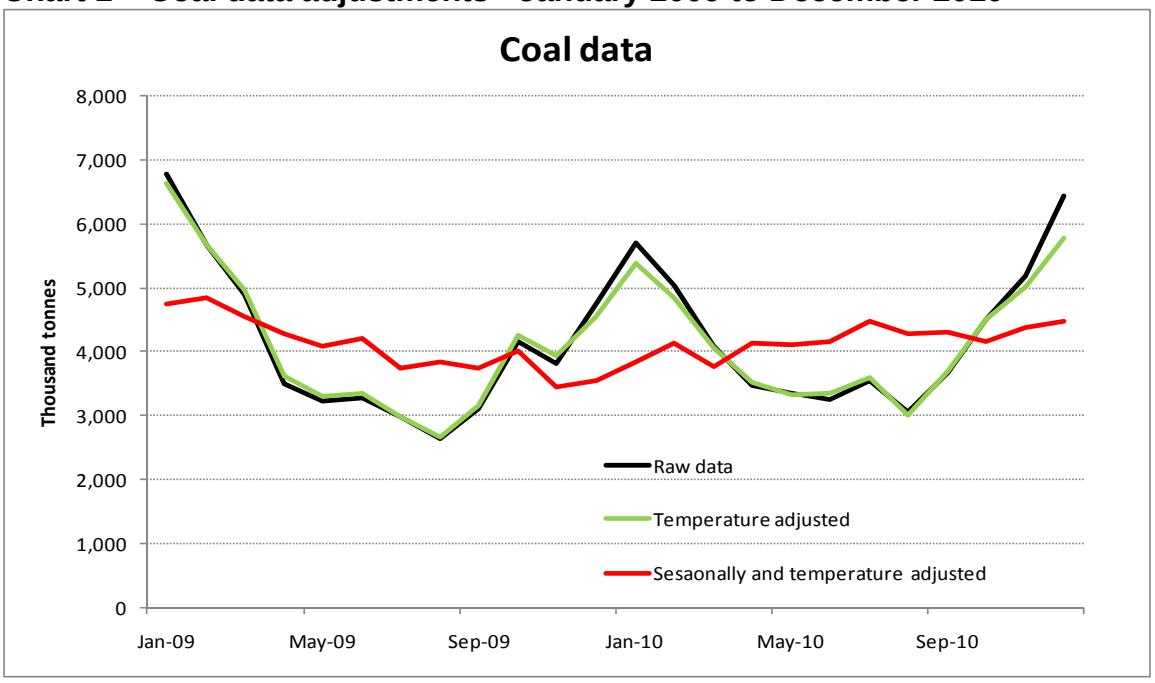
This article details a revised methodology that the Department of Energy and Climate Change (DECC) plan to use, from September 2011, to produce seasonally adjusted and temperature corrected estimates of primary energy consumption. This data is published in table 1.2 of Energy Trends. This article is based on a study prepared for DECC by the Office for National Statistics (ONS), funded by the UK Statistics Authority's Quality Improvement Fund, and subsequent research conducted by DECC. The ONS paper is available on the DECC website at: www.decc.gov.uk/en/content/cms/statistics/energy_stats/source/total/total.aspx.

DECC publishes monthly estimates of energy consumption by fuel types. As well as 'raw' figures, the Department publishes adjusted series which are both temperature corrected and seasonally adjusted. The latter are the key estimates for users interested in energy efficiency at a macro level, and the Department judges that increasing attention is being given to year on year changes in the temperature adjusted data.

Existing method

The current method of temperature correction is to compare the temperature in a given month (using Met Office data) with a long term average for that month, using degrees Celsius, to arrive at a temperature deviation. For each fuel type and month there is a given factor which is multiplied by the deviation to give the percentage increase or decrease to apply to the consumption estimate. For example, in April 2009 the observed temperature is calculated from the Met Office data to be 1.8 degrees higher than the long term average for April. The factor for coal in April is 2.1% so that the 'raw' April figure for coal needs to be adjusted by 1.8 × 2.1% = 3.7% – meaning the consumption figure is increased by 3.7 per cent. (The method assumes that energy consumption increases in colder weather and reduces in warmer weather, so that the temperature correction adjusts the consumption figure up in this example.) Chart 1 shows the current adjustments for coal data.

Chart 1 – Coal data adjustments - January 2009 to December 2010



The temperature correction takes place in this way for coal and petroleum. For natural gas the temperature correction is performed in a different way by the data supplier (National Grid), and DECC then seasonally adjusts it. However the method used by National Grid has recently been modified and DECC now judges that the new methodology is unsuitable for its purposes.

Coal, petroleum and natural gas account for about 90 per cent of total consumption. The nuclear generation series is not temperature corrected because it is generally baseload and takes place without responding directly to demand. For similar reasons the wind and hydroelectric series are not temperature corrected. Both series are currently seasonally adjusted. Finally the net imports of electricity is not adjusted at all, as no identifiable seasonality has been found for this series.

All the monthly component series of primary energy consumption are now collected and reported on a calendar month basis. Before 2009 some of the series, such as coal, were collected on a statistical month basis ('4, 4, 5': i.e. two months of four weeks followed by a single month of five weeks, with the occasional 'leap week' to bring the statistical months back in line with the calendar).

After the temperature correction has taken place the series undergo the seasonal adjustment process using the X11ARIMA software package in the usual way as recommended for the Government Statistical Service by the Office for National Statistics.

Changes proposed

In reviewing the existing method, a number of changes were considered. Five changes are to be implemented, the first three of which are likely to have a greater impact than the final two listed.

1. Heating degree days

DECC plan to move to using heating degree days to adjust for temperature rather than the average temperature in the month. Heating degree days (HDD) are defined relative to a base temperature - the outside temperature above which a building needs no heating. Typically 15.5° or 18° Celsius are used for the base temperature across Europe. DECC is likely to use 15.5° as the base data, as this seems the value most commonly used by other comparable countries, and a higher value did not produce appreciably better results. If the average outside air temperature on a given day is above this base temperature, you will not need to use any energy for heat; whilst if it is below, then your heat requirement that day will be in proportion to the temperature deficit in degrees. For example, if we are using a base of 15.5° and a day has an average temperature of 10°, then we calculate the HDD as 5.5. If the outside average temperature was minus 2°, then we would calculate the HDD as 17.5. The HDD's are summed for the month, and this value is then compared with the long term average. For example the long term average (from 1971 to 2000) for November is 257 HDD or 8.56 degrees per day. November 2009 was mild, and the HDD was calculated as 212 HDD, whilst the colder November 2010 has an HDD or 304. The above numbers are calculated based on the average daily temperature (the average of the maximum and the minimum temperature) at each of 17 locations around the UK.

Charts 2 and 3 show average heating degree days by month, and over the period 2002 to 2011. Chart 3 shows the variability within the number of degree days in a specific month. The largest variation is found in December, with 9.1 HDD in 2006, and 15.8 in 2010. The monthly average degree day data will be published alongside the monthly average data in the internet Energy Trends table 6.1 (Average temperatures and deviations from the long term mean).

One particular advantage of this method is that it produces a more intuitively sensible result. If we have two months – one with each day having average temperatures of 16°, and another where 15 days had an average temperature of 10° and 15 days of 22°, both of the months would have identical average temperatures of 16°. However, in the first case we would have zero heating days, whilst in the latter case we would have 15 * 5.5° + 15 * 0 = 82.5 HDD. It seems that these two months should have different heating requirements, suggesting that the HDD methodology should produce a superior adjustment. More details on this are provided in the ONS paper mentioned in the introduction.

Chart 2 – Heating degree days by month

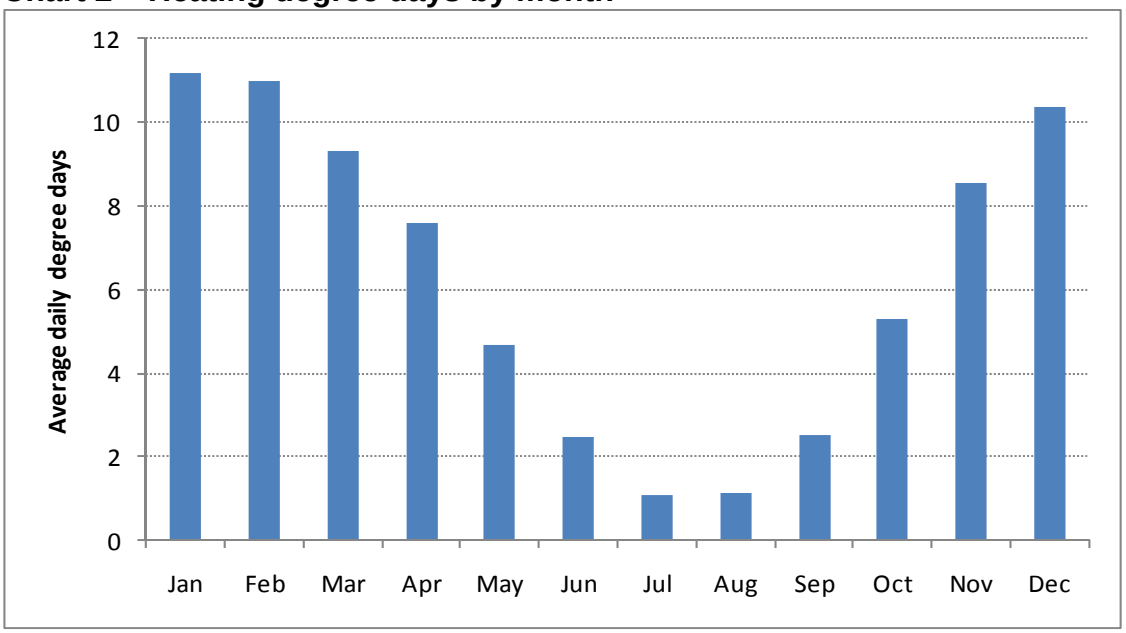
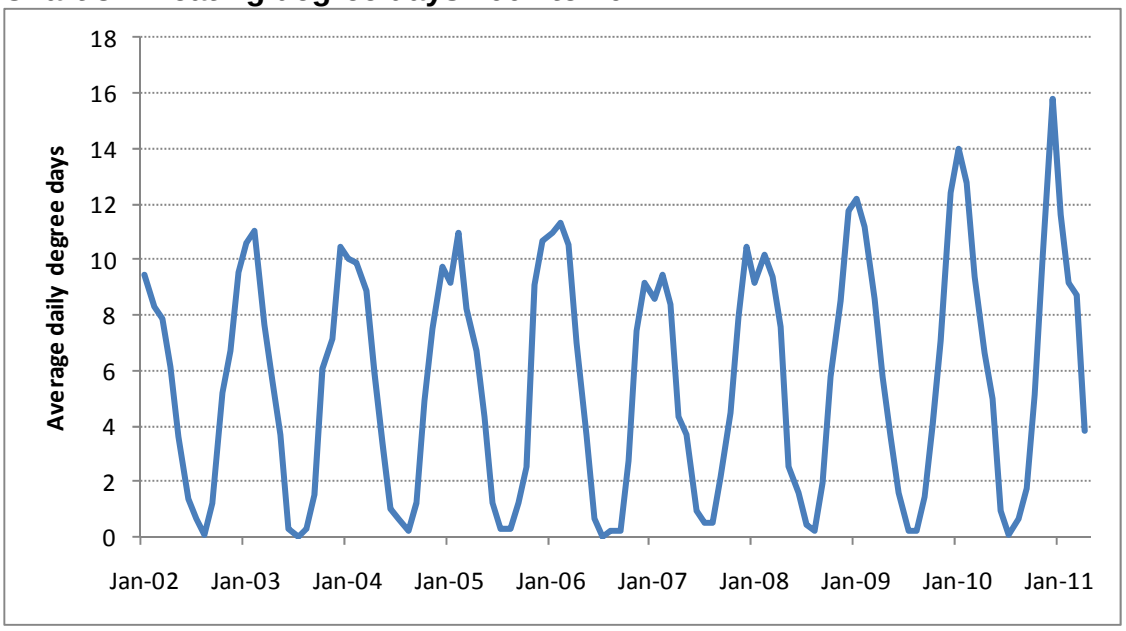


Chart 3 – Heating degree days 2002 to 2011



Research was conducted to look at whether adjustments should be made for degree cooling days. These were found to have little effect currently on the UK energy series. This subject area will be revisited in a few years to check to see if any adjustments for this should be made.

2. Different factors for different months

The current method, e.g. for coal, uses a set factor that is applied for each degree day of difference. However, research has shown that a 1 degree average change does not have the same effect in each month. In particular, research has shown that the largest effects are found in the "shoulder" seasons between summer and winter in April, September and October. In the winter, if heating is fully switched on, a 1 degree difference in the outside temperature will have a limited effect on energy consumption. In the summer, a 1 degree change may not be sufficient to result in additional heating being used. However, in October, a 1 degree difference may well be sufficient to result in heating being turned on or turned off, so resulting in a larger change.

3. DECC to adjust gas data directly

DECC currently receive both unadjusted and temperature corrected data from National Grid. Previously this data was based on a fixed base period – with adjustments made to account for changes in temperature in the month compared with this base period. National Grid have changed their method and are now using a rolling base period. This method helps users who are wishing to forecast demand, however, it can lead to distortions based on the new data that joins the base comparison along with the data that leaves the comparison. DECC have estimated temperature effects from the raw data series using the HDD approach and these will be applied from September 2011.

4. X12ARIMA

DECC plan to move from using the X11ARIMA program to the more updated X12ARIMA program, available from the US Census Bureau. The X12ARIMA program is the recommended standard used by the UK Government Statistical Service. This change is likely to have a minimal impact in itself, as the basic algorithms of the programs are essentially unchanged.

5. DECC to stop temperature correcting oil data

Research showed that temperature and seasonally adjusting oil data led to little improvement in the quality of the new data series for oil consumption. As a result a decision has been made to stop temperature correcting the series.

Additional developments

Currently DECC only temperature adjust the monthly components of inland energy consumption on a primary basis. DECC will further investigate over the coming months the quarterly adjustment of components of final energy consumption. In particular, items of consumption, such as domestic gas consumption are particularly effected by temperature variations. Some preliminary research has been conducted, and is being evaluated. The following table shows the scale of temperature effects on domestic energy consumption data in the fourth quarter of 2010 compared to a year earlier.

Table 1 – Domestic consumption growth by fuel

	Raw data growth into 4th quarter of 2010	Temperature corrected growth into 4th quarter of 2010
Gas	30%	3%
Electricity	5%	-2%
Coal	4%	-6%
Total	22%	1%

User feedback

DECC are interested in the views of current users of the temperature corrected data to the options proposed above. Comments are also sought on whether users would find it useful for DECC to publish temperature and seasonally adjusted data for components of final consumption. Please send any comments to Iain MacLeay using the contact details below.

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Improvements to rail data in oil tables

Background

In the petroleum balance, supply from oil refineries is matched as closely as possible to demand. Historically, information on gas oil used by rail has been one of the weaker elements as the fuel is often sold to intermediate companies before being sold to the final consumers (Train Operating Companies).

DECC receive information from our contractors, AEA Energy and Environment, on the fuel used by the rail industry, but this is on a year minus two basis as required for the Greenhouse Gas Inventory. Therefore the rail use for the most recent year needs to be estimated.

In order to estimate fuel use in railways on a year-1 lag, exploratory work was conducted to see whether vehicle km (passenger travel) and net tonne km (freight transport) provided a secure base for estimating fuel use in rail transport.

Sources of data and approach taken

Given that a close relationship between passenger and freight transport and fuel use might be expected, data were obtained on :

- Fuel use (from the Office of Rail Regulation (year minus two)).
- Data on passenger and freight movements in Great Britain (from the Office of Rail Regulation on a quarterly basis with a shorter time lag).
- Data on passenger movements in Northern Ireland (from Translink, the only operating company in Northern Ireland). There is no rail freight in Northern Ireland.

The model

Initial modelling showed a strong relationship between passenger and freight movements and fuel use, so a multiple regression[1] model was built.

Equation 1: predicting gasoil

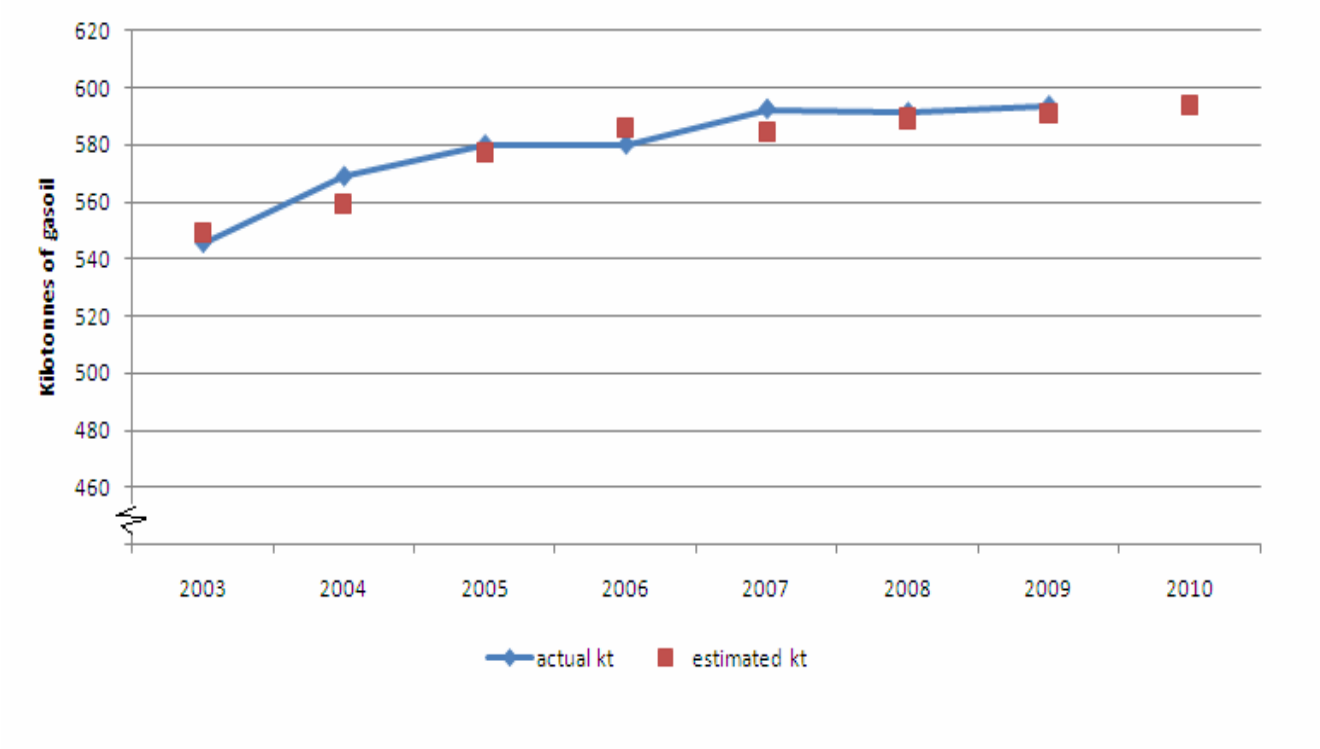
*Gasoil use (kt) = 45.64 + 0.78 * million vehicle km + 8.05 * billion net tonne km*

This gives estimated fuel use in 2010 as 594 kt.

Whilst there are only a few observations, passenger and freight movements account for the bulk of the variation in the fuel used (R^2 = 0.89) and the difference between the actual and estimated values are in close alignment and evenly distributed. Broadly, the gap between the actual and estimated values are under 2 per cent in all cases. Chart 1 shows the relationship between the actual values and the estimated values.

[1] A simple regression model using just one of the two variables was also considered, but rejected as it proved not to be a good predictor.

Chart 1: Relationship between actual and estimated values



Over the long term this model may become less effective as a predictor, due to electrification of more of the rail network, and efficiency improvements meaning that less fuel is needed. However for the next few years this model should provide an adequate estimate for the current year. DECC will review the model when compiling each edition of the Digest of UK Energy Statistics (DUKES).

Burning oil

Burning oil used for heating which has historically been recorded in Table 3.2 of DUKES to account for heating in depots. However, following discussions with the Association of Train Operating Companies, it has been decided to remove this from the DUKES tables. It will be placed in unspecified industry as we cannot be sure where this fuel is being used.

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Energy flows in the UK Iron and Steel Industry

Flows of energy within the UK iron and steel industry are complex. This article illustrate these flows, show how they relate to the relevant production processes, and how they relate to data published in the Digest of UK Energy Statistics.

Throughout the article, a number of steel-related terms and acronyms are used:

Term / Acronym	Description
Basic Oxygen Steelmaking, BOS	Process unit where iron is converted into steel
BOS Gas	Energy containing gas by-product of the steel-making process
Blast Furnace, BF	Process unit where iron ore is reduced using carbon (coke, coal, oil) and converted into liquid iron
BF Gas	Energy containing gas by-product of the iron-making process
Casting	Process whereby liquid steel is converted into semi-finished solid products
Chemical Heat	Heat available from oxidation of some components of BF iron
Coke Oven, CO	Process unit where coal is converted into coke
CO Gas	Energy containing gas by-product of the coke-making process
Electric Arc Furnace, EAF	Process unit where (mainly) scrap steel is converted into a liquid form
Hot Blast	Hot air injected into the 'blast' furnace
Iron Ore Fines	Created as a result of mining, crushing and processing the larger pieces of iron ore
Plate Iron	Iron that is solidified immediately after production at the BF
Reaction Heat	Heat required for endothermic reactions, notably the conversion of limestone to lime
Rolling Mill	Process step where semi-finished steel products are converted into final steel products
Sensible Heat	The heat content of a substance by virtue of its temperature
Sinter Plant	Process unit where iron ore is prepared for use in the BF
Slag	Non-metallic by-products of iron and steel-making
Stoves & Blowers	Process unit that pre-heats air and blows it into the BF
Transformation Energy	Energy required by the endothermic reactions in the transformation of iron ore and carbon into iron and BF gas

In the UK steel is manufactured using two main process routes. The major method, the blast furnace – basic oxygen steelmaking route (BF-BOS) uses mainly 'virgin' raw materials free from so-called residual elements. These are contaminants present in scrap steel (chiefly copper and tin) that adversely affect steel properties, especially the ability to roll it into thin sections. The second method, the Electric Arc Furnace route (EAF) uses scrap as the predominant feedstock so that its products are more suitable for relatively thick sections, and also those that can tolerate higher levels of dissolved gases which have important effects on steel properties – these are difficult to remove in the EAF. Because of limited scrap availability (almost all available scrap is already used in steelmaking), the BF-BOS route is also used for heavier sections as well as for flat ('strip') products. These two routes are illustrated in the flow chart at the end of this article along with the energy flows they involve. The flow line widths indicate the relative magnitudes of the energy vectors, but it must be emphasised that the figure is only qualitative in nature.

In 2009 approximately 80% of the steel manufactured in the UK was produced via the BF-BOS route, in which the BF is the central process. Coal is converted into coke in coke ovens and meanwhile iron ore fines are agglomerated into usable lump form at the sinter plant. The coke and iron ore are then layered into the BF, via chutes at the top of the furnace, whilst hot blast and (usually) coal are injected at lower levels in the furnace. As the iron ore passes down through the

furnace it is chemically reduced by the carbon contained in the coal and coke (at temperatures up to 2000°C), emerging at the bottom of the furnace as liquid iron. The latter is 'tapped' from the furnace and moved to the BOS plant in so-called 'torpedo ladles', which are heavily insulated to minimise energy losses during transportation. At the BOS plant oxygen is 'blown' into the liquid iron to remove further impurities and, critically, to reduce the carbon content of the liquid from its saturation value of >4% to that required in the steel product, typically 0.1 – 0.2%. This process is carried out in a vessel that can be tilted to 'tap' both the generated slag and the liquid steel, the latter being transported in ladles to the casting plant.

In the EAF process liquid steel is created through the melting of scrap and a small amount of carbon, usually in the form of coke, for chemical balance and to allow a 'boil' to help flush out dissolved gases to acceptable levels. If available (and especially for high quality EAF steels where residual elements need control) a proportion of plate iron can be used for this purpose. Operating temperatures are kept as close as possible to the steel melting point (roughly 1550°C), in order to minimise energy usage. As with the BF-BOS route the liquid steel is then transported to the caster.

At the caster the steel is poured into a water-cooled reciprocating mould, where it forms a 'strand' which gradually solidifies as it is extruded from the mould. As it solidifies the steel cools from about 1600°C to 1250°C. It then cools further to 800°C before the strand is cut into pieces of slab, bloom, or billet. The terminology used here depends on the cross-sectional size, and shape, of the cast product. In ideal circumstances these semi-finished products pass straight to the rolling mill where they are shaped into the final steel product. Historical process configurations and the need for uniform temperature cross sections mean that most often this is not the case, however, and the steel cools to ambient before having to be reheated in a furnace prior to rolling. After rolling, products are cooled on specially designed banks to minimise distortion during the cooling process.

As can be seen from the flow chart the above process routes create a complex energy flow that makes it; a) difficult to generate precise data for statistical purposes, and b) hard for those outside of the industry to relate aggregated data to these processes. Where possible the table below therefore takes data from the Digest of UK Energy Statistics (for the year 2009), and relates it through the numbered labels to energy flows on the above figure.

Energy Vector	**Label**	**Magnitude**	**Category and table numbers in DUKES**
Coal	1	4.9 Mt	Coke manufacture (Table 2.7)
Coal	2	0.9 Mt	Blast furnaces (Table 2.7)
CO Gas	3	8.0 TWh	Production (Table 2.9)
CO Gas	4	3.9 TWh	Coke manufacture (Table 2.9)
CO Gas	5	0.6 TWh	Blast furnaces (Table 2.9)
CO Gas	6	3.5 TWh	Auto-generators, heat generation, iron and steel (Table 2.9)
CO Gas	7	0.1 TWh	Losses (Table 2.9)
CO Gas	8	3.0 TWh	Auto-generators, heat generation (Table 2.9)
CO Gas	9	0.5 TWh	Iron and steel (Table 2.9)
Coke	10	3.6 Mt	Production (Table 2.8)
Coke	11	2.8 Mt	Blast Furnaces (Table 2.8)
BF Gas	12	11.4 TWh	Production (Table 2.9)
BF Gas	13	3.2 TWh	Blast furnaces (Table 2.9)
BF Gas	14	0.4 TWh	Iron and steel (Table 2.9)
BF Gas	15	6.5 TWh	Auto-generators, heat generation (Table 2.9)
BF Gas	16	0.5 TWh	Coke manufacture (Table 2.9)
BF Gas	17	0.7 TWh	Losses (Table 2.9)
Natural Gas	18	5.0 TWh	Iron and steel (Table 4.1)
Electricity	19*	3.6 TWh	Iron and steel (Table 5.1)
Fuel Oil	20	0.2 Mt	Blast furnaces (Table 3.2)

* Purchased electricity is utilised at numerous facilities and adds to the self-generated supply, 21.

Some data from DUKES cannot be utilised as iron and steel industry data is combined with that of other industries, conversely many of the energy vectors illustrated in the figure are too small to be individually identified at a national level. The figures in the table on page 45, when combined with the relevant data, does however provide a useful introduction to the complexities of energy flow and management within the UK iron and steel industry.

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The DECC statistics team would like to thank Tata Steel for producing this insight. For questions on the coverage of these statistics within DUKES and other DECC statistics publications please contact:

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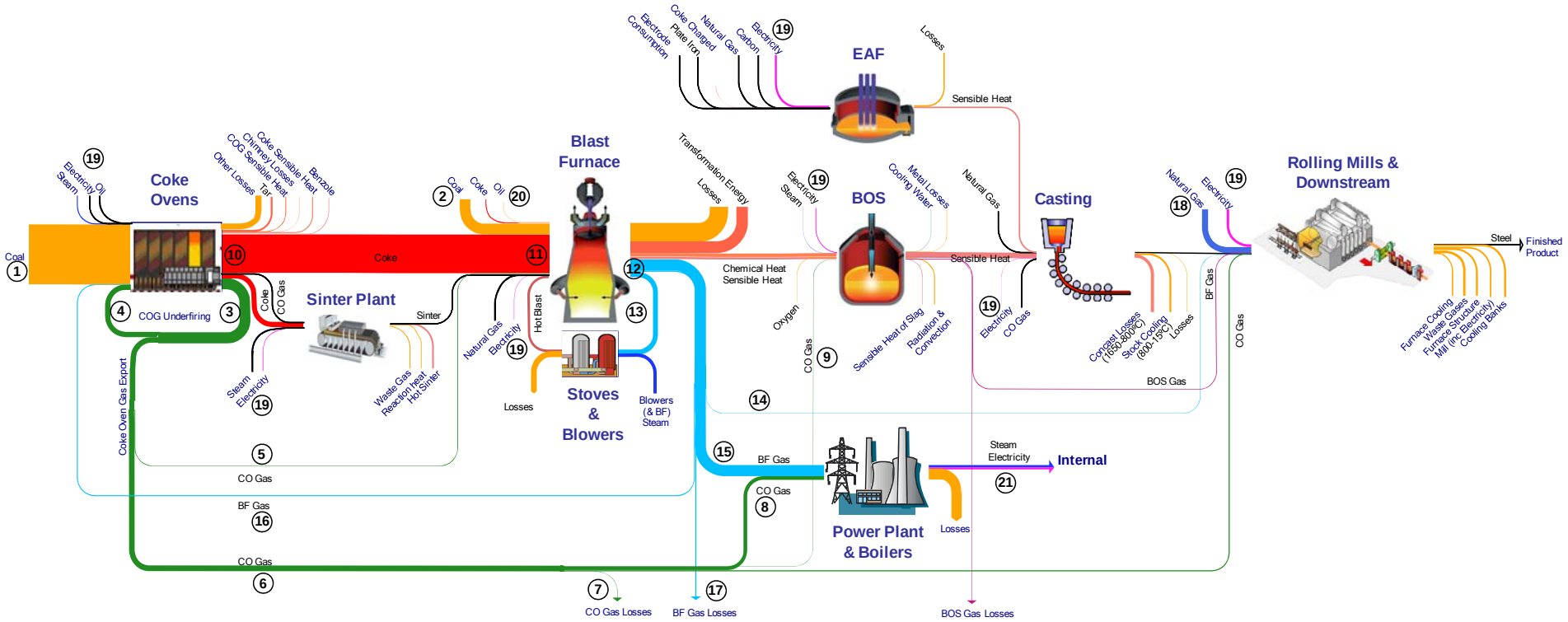
Simplified 2009 UK Iron and Steel Industry Energy Flows



Recent and forthcoming publications of interest to users of energy statistics

Digest of United Kingdom Energy Statistics

This annual publication provides essential information for everyone involved in energy, from economists to environmentalists, and from energy suppliers to energy users. The 2011 edition will be published on 28 July 2011. With extensive tables, charts and commentary covering all the major aspects of energy, it provides a detailed and comprehensive picture of energy production and use over the last 5 years. It will be available to purchase from The Stationery Office, cost £60, and it can also be accessed for free on the Internet (along with additional annexes and key series back to 1970) at: www.decc.gov.uk/en/content/cms/statistics/publications/dukes/dukes.aspx

Energy Flow Chart

This annual publication illustrates the flow of primary fuels from home production and imports to their eventual final uses. The flows are shown in their original state and after being converted into different kinds of energy by the secondary fuel producers, and are measured in million tonnes of oil equivalent, with the widths of the bands approximately proportional to the size of the flows they represent. The 2011 edition of the chart, showing the flows for 2010, will be published on 28 July 2011. The Chart will be available free from DECC; it can also be accessed on the Internet at: www.decc.gov.uk/en/content/cms/statistics/publications/flow/flow.aspx

UK Energy in Brief

This annual publication summarises the latest statistics on energy production, consumption, prices and climate change in the United Kingdom. The figures are primarily taken from the Digest of United Kingdom Energy Statistics (see above). The 2011 edition will be published on 28 July 2011 and will be available free from DECC. It can also be accessed on the Internet at: www.decc.gov.uk/en/content/cms/statistics/publications/brief/brief.aspx

Energy Consumption in the UK

This annual Internet only publication brings together statistics from a variety of sources to produce a comprehensive review of energy consumption and changes in efficiency, intensity and output since the 1970s, with a particular focus on trends since 1990. The information is presented in five sections covering overall energy consumption and energy consumption in the transport, domestic, industrial and service sectors. The 2011 edition will be published on 28 July 2011; it can be accessed on the Internet at: www.decc.gov.uk/en/content/cms/statistics/publications/ecuk/ecuk.aspx

Fuel Poverty Statistics

This annual Internet only publication, published in support of the UK Fuel Poverty Strategy, details the latest statistics on fuel poverty. The 2011 edition, detailing the 2009 statistics, will be published on 14 July 2011, it can be accessed on the Internet, along with a series of appendices, at: www.decc.gov.uk/en/content/cms/statistics/fuelpov_stats/fuelpov_stats.aspx

UK Energy Sector Indicators

This annual publication is designed to show the extent to which secure, diverse and sustainable supplies of energy to UK businesses and consumers, at competitive prices, are ensured.

In previous years a main set of indicators was released in July with a more detailed set of background indicators released in October. DECC has now decided that as the main indicators contained data already available in the publications above that the July release will no longer take place. The indicators release in October will still take place, in 2011 this will be on Thursday 27 October; the data will be available on the Internet at: www.decc.gov.uk/en/content/cms/statistics/publications/indicators/indicators.aspx

1 TOTAL ENERGY

TABLE 1.1. Indigenous production of primary fuels

Million tonnes of oil equivalent

						Primary electricity	
		Total	Coal[1,2]	Petroleum[3]	Natural gas[4]	Nuclear	Wind and natural flow hydro[5]
2008		177.0	13.9	78.6	71.5	11.9	1.06
2009		166.9	14.0	74.7	61.6	15.2	1.25
2010 p		157.2	14.2	69.0	59.1	13.7	1.19
Per cent change		*-5.8*	*+1.3*	*-7.7*	*-4.1*	*-10.1*	*-5.5*
2010	Quarter 1	42.4	3.0	18.8	16.3	4.0	0.28
	Quarter 2	39.9	3.6	17.5	15.5	3.1	0.20
	Quarter 3	35.7	3.9	15.5	13.1	2.9	0.31
	Quarter 4	39.2	3.7	17.1	14.2	3.8	0.40
2011	Quarter 1 p	37.8	3.7	15.9	13.5	4.3	0.40r
Per cent change[6]		*-10.9*	*+23.2*	*-15.5*	*-17.2*	*+6.9*	*+43.5*

1. Includes solid renewable sources (wood, straw and waste), a small amount of renewable primary heat sources (solar, geothermal etc), liquid biofuels and an estimate for slurry.
2. Calculated on statistical months; data for 2008 is 4 days longer than the standard SRP for January to December 2008. This is to enable a smooth transition to publishing data on a calendar month basis from January 2009 rather than 4 and 5 week statistical reporting periods (SRPs).
3. Crude oil, offshore and land, plus condensates and petroleum gases derived at onshore treatment plants.
4. Includes colliery methane, landfill gas and sewage gas. Excludes gas flared or re-injected.
5. Includes generation by solar PV.
6. Percentage change in the first quarter of 2011 compared with a year earlier.

1 TOTAL ENERGY

TABLE 1.2 Inland energy consumption: primary fuel input basis

Million tonnes of oil equivalent

						Primary electricity							Primary electricity		
		Total	Coal[1]	Petroleum[2]	Natural gas[3]	Nuclear	Wind and natural flow hydro[4]	Net imports	Total	Coal	Petroleum	Natural gas	Nuclear	Wind and natural flow hydro	Net imports
		Unadjusted[5]							*Seasonally adjusted and temperature corrected*[6,7,9] *(annualised rates)*						
2008		225.2	41.4	75.1	94.9	11.9	1.06	0.95	226.3	41.6	75.4	95.4	11.9	1.06	0.95
2009		211.0r	35.2	71.2r	87.8	15.2	1.25	0.25	212.5r	35.4	71.7r	88.7	15.2	1.25	0.25
2010 p		217.6r	36.8	70.5r	95.1	13.7	1.19	0.23	211.5r	36.1	69.5r	90.8	13.7	1.18	0.23
Per cent change		*+3.1*	*+4.5*	*-1.0*	*+8.3*	*-10.1*	*-5.5*	*-6.9*	*-0.4*	*+2.1*	*-3.0*	*+2.4*	*-10.1*	*-5.5*	*-6.9*
2010	Quarter 1	64.9	10.5	18.0	32.3	4.0	0.28	-0.15	214.3r	34.0	69.7r	95.5	14.8	0.88	-0.58
	Quarter 2	47.3	7.4	17.0r	19.5	3.1	0.20	0.12	210.5	35.7	69.1r	91.8	12.4	1.07	0.49
	Quarter 3	44.0r	7.6	17.7r	15.3	2.9	0.31	0.24	209.0r	37.4	69.7r	87.6	11.9	1.48	0.95
	Quarter 4	61.4r	11.3	17.8r	28.1	3.8	0.40	0.02	212.3r	37.3	69.5r	88.4	15.7	1.32	0.06
2011	Quarter 1 p	60.6r	11.1	17.4r	27.3	4.3	0.40r	0.09	210.4r	37.9r	70.2r	84.8r	15.9	1.33r	0.37
Per cent change[8]		*-6.6*	*+6.1*	*-3.4*	*-15.3*	*+6.9*	*+43.5*	*(-)*	*-1.8*	*+11.3*	*+0.6*	*-11.1*	*+6.9*	*+51.9*	*(-)*

1. Includes solid renewable sources (wood, straw and waste), a small amount of renewable primary heat sources (solar, geothermal, etc.), liquid biofuels and net foreign trade and stock changes in other solid fuels.
2. Inland deliveries for energy use, plus refinery fuel and losses, minus the differences between deliveries and actual consumption at power stations.
3. Includes gas used during production, colliery methane, landfill gas and sewage gas. Excludes gas flared or re-injected and non-energy use of gas.
4. Includes generation by solar PV. Excludes generation from pumped storage stations.
5. Not seasonally adjusted or temperature corrected.
6. Coal, petroleum and natural gas are temperature corrected.
7. For details of temperature correction see the Digest of UK Energy Statistics 2010: long-term trends; Seasonal and temperature adjustment factors were reassessed in July 2010 www.decc.gov.uk/en/content/cms/statistics/publications/dukes/dukes.aspx
8. Percentage change in the first quarter of 2011 compared with a year earlier.
9. National Grid have changed their methodology for calculating the temperature correction of gas. More information on the methodology used by National Grid can be found at www.nationalgrid.com/uk/Gas/OperationalInfo/operationaldocuments/Gas+Demand+and+Supply+Forecasting+Methodology.

1 TOTAL ENERGY

Table 1.3a Supply and use of fuels

Thousand tonnes of oil equivalent

	2009	2010 p	*per cent change*	2009 1st quarter	2009 2nd quarter	2009 3rd quarter	2009 4th quarter	2010 1st quarter	2010 2nd quarter	2010 3rd quarter	2010 4th quarter	2011 1st quarter p	*per cent change* [1]
SUPPLY													
Indigenous production	166,978r	157,839r	*-5.5*	45,498r	43,856r	35,946r	41,677r	42,768r	39,941r	35,714r	39,416r	38,233	*-10.6*
Imports	149,644r	156,550r	*+4.6*	41,380r	33,946r	34,458r	39,860r	41,971r	37,239r	33,776r	43,565r	42,349	*+0.9*
Exports	-90,162r	-91,066r	*+1.0*	-22,655r	-24,446r	-20,115r	-22,946r	-22,168r	-24,203r	-21,323r	-23,372r	-19,413	*-12.4*
Marine bunkers	-2,615r	-2,251r	*-13.9*	-554r	-711r	-661r	-688r	-494r	-562r	-628r	-567r	-581	*+17.7*
Stock change [2]	-3,704	+6,393r		+1,982	-3,646r	-3,491	+1,451r	+5,439r	-2,451r	-1,346r	+4,751r	+2,690	
Primary supply	220,141r	227,467r	*+3.3*	65,650r	49,000r	46,137r	59,354r	67,516r	49,964r	46,194r	63,793r	63,279	*-6.3*
Statistical difference [3]	12r	-32r		29r	18r	-125r	90r	127r	-246r	-1r	88r	+230	
Primary demand	220,129r	227,499r	*+3.3*	65,621r	48,982r	46,262r	59,264r	67,389r	50,210r	46,195r	63,705r	63,049	*-6.4*
Transfers [4]	-92r	-106r		-13	-2	-54r	-24	-9r	-16r	-76r	-4r	-22	
TRANSFORMATION	-49,663r	-50,167r	*+1.0*	-14,242r	-11,239r	-10,987r	-13,194r	-14,391r	-11,454r	-10,684r	-13,637r	-13,382	*-7.0*
Electricity generation	-46,114r	-46,770r	*+1.4*	-13,231r	-10,522r	-10,236r	-12,126r	-13,272r	-10,494r	-10,070r	-12,935r	-12,777	*-3.7*
Heat generation	-1,096r	-1,097r	*+0.1*	-328r	-242r	-218r	-308r	-328r	-242r	-218r	-309r	-310	*-5.4*
Petroleum refineries	-268r	-222r	*-17.1*	-187r	55r	1r	-136r	-234r	-190r	86r	116r	165	*(-)*
Coke manufacture	-150	-193	*+29.2*	-41	-42	-41	-26	-38	-36	-39	-81	-2	*-95.7*
Blast furnaces	-2,024	-1,924r	*-4.9*	-458	-480	-484	-601	-541r	-503	-441r	-439	-462	*-14.6*
Patent fuel manufacture	-11	40	*(-)*	3	-8	-8	3	22	10r	-2	10	4	*-80.7*
Energy industry use	14,084r	14,252r	*+1.2*	3,794r	3,487r	3,240r	3,563r	3,630r	3,585r	3,392r	3,645r	3,562	*-1.8*
Losses	3,790	4,233	*+11.7*	1,080	885	845	980	1,240	1,061	914	1,018	1,109	*-10.5*
FINAL CONSUMPTION	152,501r	158,741r	*+4.1*	46,487r	33,372r	31,141r	41,501r	48,114r	34,097r	31,133r	45,397r	44,968	*-6.5*
Iron & steel	1,199r	1,402r	*+16.9*	290	282	291	336	360r	364	334	344r	376	*+4.3*
Other industries	25,163r	26,186r	*+4.1*	7,011r	5,207r	5,492r	7,452r	7,535r	5,442r	5,448r	7,761r	7,355	*-2.4*
Transport	56,563r	56,079r	*-0.9*	14,136r	14,191r	14,739r	13,496r	13,715r	13,920r	14,801r	13,643r	13,677	*-0.3*
Domestic	43,217r	48,083r	*+11.3*	17,133r	7,518r	5,187r	13,378r	18,405r	7,992r	5,181r	16,505r	15,849	*-13.9*
Other Final Users	17,385r	17,923r	*+3.1*	5,621r	3,792r	3,223r	4,748r	5,946r	3,787r	3,147r	5,043r	5,468	*-8.0*
Non energy use	8,974r	9,068r	*+1.0*	2,295r	2,381r	2,209r	2,090r	2,153r	2,591r	2,221r	2,102r	2,244	*+4.2*
DEPENDENCY [5]													
Net import dependency	26.7%	28.5% r		28.3%	19.1%	30.6%	28.2%	29.1% r	25.8%	26.6% r	31.4%	35.9%	
Fossil fuel dependency	89.1% r	89.8% r		90.8% r	87.3% r	87.2% r	90.3% r	90.6% r	89.5%	88.4%	90.1% r	88.8%	

1. Percentage change in the first quarter of 2011 compared with a year earlier.
2. Stock fall (+), stock rise (-).
3. Primary supply minus primary demand.
4. Annual transfers should ideally be zero. For manufactured fuels differences occur in the rescreening of coke to breeze.
   For oil and petroleum products differences arise due to small variations in the calorific values used.
5. See article in the December 2010 edition of Energy Trends at: www.decc.gov.uk/en/content/cms/statistics/publications/trends/articles_issue/articles_issue.aspx

1 TOTAL ENERGY

Table 1.3b Supply and use of fuels

Thousand tonnes of oil equivalent

	2010 Quarter 1									2011 Quarter 1 p								
	Coal	Manufactured fuels[4]	Primary oil	Petroleum Products	Natural gas[5]	Rennewables & waste[6]	Primary electricity	Electricity	Heat sold	Coal	Manufactured fuels[4]	Primary oil	Petroleum Products	Natural gas[5]	Rennewables & waste[6]	Primary electricity	Electricity	Heat sold
SUPPLY																		
Indigenous production	2,215	-	18,846	-	15,830	1,512	4,365	-	-	2,926	-	15,903	-	13,033	1,605	4,767	-	-
Imports	4,996	13	13,575	7,083	15,808	435	-	60	-	4,930	15	15,025	6,266	15,564	394	-	154	-
Exports	-97	-93	-12,557	-6,748	-2,441	-26	-	-205	-	-121	-96	-9,718	-7,209	-2,139	-67	-	-62	-
Marine bunkers	-	-	-	-494	-	-	-	-	-	-	-	-	-581	-	-	-	-	-
Stock change[1]	+2,383	+38	-106	+325	+2,799	-	-	-	-	+2,394	-44	-552	+308	+585	-	-	-	-
Primary supply	9,497	-42	19,758	166	31,996	1,921	4,365	-145	-	10,129	-125	20,658	-1,216	27,043	1,933	4,767	91	-
Statistical difference[2]	+14	+1	+90	+15	-7	-	-	+13	-	+166	-5	+251	-56	-93	-	-	-32	-
Primary demand	9,482	-43	19,668	150	32,003	1,921	4,365	-158	-	9,963	-120	20,407	-1,160	27,136	1,933	4,767	124	-
Transfers[3]	-	-14	-610	+625	-10	-	-282	+282	-	-	-21	-655	+657	-3	-	-400	+400	-
TRANSFORMATION	-9,032	486	-19,057	18,414	-9,408	-1,109	-4,083	8,965	433	-9,536	578	-19,752	19,606	-7,575	-1,214	-4,366	8,444	433
Electricity generation	-7,746	-186	-	-353	-8,761	-1,109	-4,083	8,965	-	-8,283	-152	-	-257	-6,949	-1,214	-4,366	8,444	-
Heat generation	-84	-13	-	-16	-647	-	-	-	433	-88	-13	-	-17	-626	-	-	-	433
Petroleum refineries	-	-	-19,057	18,824	-	-	-	-	-	-	-	-19,752	19,917	-	-	-	-	-
Coke manufacture	-962	924	-	-	-	-	-	-	-	-921	919	-	-	-	-	-	-	-
Blast furnaces	-201	-301	-	-40	-	-	-	-	-	-188	-237	-	-37	-	-	-	-	-
Patent fuel manufacture	-38	60	-	-	-	-	-	-	-	-57	61	-	-	-	-	-	-	-
Energy industry use	2	178	-	1,155	1,649	-	-	623	23	1	163	-	1,310	1,437	-	-	628	23
Losses	-	30	-	-	558	-	-	652	-	-	36	-	-	377	-	-	696	-
FINAL CONSUMPTION	449	221	-	18,034	20,379	812	-	7,815	405	426	238	-	17,793	17,744	719	-	7,644	404
Iron & steel	7	100	-	25	152	-	-	76	-	0	140	-	24	139	-	-	73	-
Other industries	286	52	-	1,264	3,386	160	-	2,163	224	286	37	-	1,174	3,116	162	-	2,356	224
Transport	1	-	-	13,220	-	303	-	191	-	-	-	-	13,293	-	221	-	162	-
Domestic	142	69	-	1,227	13,640	208	-	3,099	21	133	60	-	960	11,523	193	-	2,959	21
Other final users	14	-	-	337	3,008	142	-	2,287	159	7	-	-	292	2,773	143	-	2,094	159
Non energy use	-	-	-	1,960	193	-	-	-	-	-	-	-	2,051	193	-	-	-	-

1. Stock fall (+), stock rise (-).
2. Primary supply minus primary demand.
3. Annual transfers should ideally be zero. For manufactured fuels differences occur in the rescreening of coke to breeze. For oil and petroleum products differences arise due to small variations in the calorific values used.
4. Includes all manufactured solid fuels, benzole, tars, coke oven gas and blast furnace gas.
5. Inludes colliery methane.
6. Includes geothermal, solar heat and biofuels for transport; wind and wave electricity included in primary electricity figures.

2 SOLID FUEL AND DERIVED GASES

Table 2.1 Supply and consumption of coal

Thousand tonnes

	2009	2010 p	*per cent change*	2009 1st quarter	2009 2nd quarter	2009 3rd quarter	2009 4th quarter	2010 1st quarter	2010 2nd quarter	2010 3rd quarter	2010 4th quarter	2011 1st quarter p	*per cent change*[1]
SUPPLY													
Indigenous production	17,874	18,159	*+1.6*	4,101	4,800	4,683	4,290	3,586	4,664	5,125	4,785	4,701	*+31.1*
Deep mined	7,520	7,390	*-1.7*	1,620	2,181	2,020	1,699	1,138	1,856	2,113	2,284	2,039	*+79.2*
Surface mining[2]	9,854	10,319	*+4.7*	2,356	2,488	2,533	2,477	2,336	2,690	2,894	2,399	2,550	*+9.2*
Other sources	500	450	*-10.0*	125	131	131	114	113	118	118	102	113	-
Imports[3]	38,167	26,521	*-30.5*	12,523	9,639	8,117	7,888	7,679	5,349	5,806	7,687	7,589	*-1.2*
Exports[4]	646	602	*-6.9*	159	98	103	287	135	146	130	190	161	*+19.1*
Stock change[5]	-6,608	+7,212		+885	-4,339	-3,973	+818	+3,691	+196	-535	+3,861	+3,689	
Total supply	48,786	51,291	*+5.1*	17,351	10,002	8,725	12,709	14,820	10,062	10,266	16,143	15,818	*+6.7*
Statistical difference	-18	-50		+11	-14	+27	-43	-72	+12	+23	-12	+5	
Total demand	48,805	51,341	*+5.2*	17,340	10,016	8,698	12,752	14,892	10,051	10,243	16,155	15,813	*+6.2*
TRANSFORMATION	46,271	48,826	*+5.5*	16,714	9,443	8,008	12,105	14,239	9,441	9,649	15,498	15,192	*+6.7*
Electricity generation	39,678	41,666	*+5.0*	15,122	7,833	6,381	10,342	12,447	7,606	7,873	13,740	13,449	*+8.0*
Heat generation[6]	465	465	-	137	104	94	130	137	104	94	130	145	*+5.8*
Coke manufacture	4,936	5,399	*+9.4*	1,220	1,232	1,204	1,281	1,321	1,390	1,357	1,331	1,263	*-4.4*
Blast furnaces	852	978	*+14.9*	149	187	244	271	275	269	221	212	257	*-6.6*
Patent fuel manufacture	340	318	*-6.6*	86	88	85	82	58	72	104	84	78	*+34.0*
Energy industry use	5	5		1	1	1	2	2	1	1	1	1	
FINAL CONSUMPTION	2,530	2,509	*-0.8*	625	572	688	645	650	609	593	657	620	*-4.7*
Iron & steel[7]	60	47		9	14	13	25	9	14	12	12	-	*(-)*
Other industries	1,759	1,675	*-4.8*	435	368	518	438	432	408	396	440	432	*+0.1*
Domestic	686	722	*+5.3*	169	185	147	184	189	174	170	189	177	*-6.2*
Other final users	84	65	*-23.5*	20	19	23	22	21	13	15	16	11	*-48.4*
Stocks at end of period													
Distributed stocks	22,640	15,392	*-32.0*	15,432	19,675	23,553	22,640	19,146	18,836	19,159	15,392	12,036	*-37.1*
Of which:													
Major power producers[8]	21,770	13,396	*-38.5*	13,845	18,360	22,863	21,770	17,544	16,728	17,613	13,396	9,646	*-45.0*
Coke ovens	806	1,338	*+65.9*	1,322	870	613	806	831	1,189	1,199	1,338	1,187	*+42.9*
Undistributed stocks	1,450	1,485	*+2.4*	1,140	1,320	1,172	1,450	1,253	1,367	1,579	1,485	1,126	*-10.1*
Total stocks[9]	24,090	16,878	*-29.9*	16,571	20,995	24,725	24,090	20,399	20,203	20,738	16,878	13,162	*-35.5*

1. Percentage change in the first quarter of 2011 compared with a year earlier.

2. The term 'surface mining' has now replaced opencast production. Opencast production is a surface mining technique.

3. For a detailed breakdown of UK Imports by country and grade of coal refer to Table 2.4 Coal imports (internet table only).

4. Trade is counted as an export under three conditions, when it is recorded as an import and is subsequently exported; it enters the UK port with the intention of being imported but due to a change of ownership at the port it is exported without having cleared the port; and when items leave the warehouse and are exported. Trade is not classified as exports when it is resting at a UK port and the UK is not the intended final destination.

5. Stock fall (+), stock rise (-).

6. Heat generation is based on an annual figure and is then split over a quarterly period. The 2010 heat generation will not be published until the end of July 2011. Therefore, the 2009 figure is used as an estimate for 2009.

7. The iron and steel consumption statistics are based on an annual figure from the EU ETS dataset and is then split over a quarterly period. The 2010 EU ETS will not be available until 2012, the 2009 estimates are used instead.

8. This includes stocks held at ports.

9. For some quarters, closing stocks may not be consistent with stock changes, due to additional stock adjustments

2 SOLID FUEL AND DERIVED GASES

Table 2.2 Supply and consumption of coke oven coke, coke breeze and other manufactured solid fuels

Thousand tonnes

	2009	2010 p	*per cent change*	2009 1st quarter	2009 2nd quarter	2009 3rd quarter	2009 4th quarter	2010 1st quarter	2010 2nd quarter	2010 3rd quarter	2010 4th quarter	2011 1st quarter p	*per cent change*[3]
SUPPLY													
Indigenous production	3,996	4,340	*+8.6*	996	989	961	1,049	1,079	1,113	1,096	1,052	1,029	*-4.6*
Coke oven coke	3,663	3,990	*+8.9*	905	911	887	960	993	1,031	1,011	955	943	*-5.1*
Coke breeze	29	32	*+10.6*	8	8	6	8	8	8	8	8	8	*-3.2*
Other MSF	303	318	*+4.9*	83	71	68	80	78	74	77	89	78	-
Imports	184	123	*-33.3*	25	1	1	157	21	34	29	39	23	*+9.3*
Exports	177	518	*(+)*	43	32	36	66	132	155	136	94	135	*+1.7*
Stock change[1]	+2	-212		-16	-22	+32	+8	+52	-28	-138	-99	-66	
Transfers	-	-		-	-	-	-	-	-	-	-	-	
Total supply	4,004	3,733	*-6.8*	962	937	958	1,147	1,020	964	851	898	851	*-16.6*
Statistical difference	-	-2		-2	-	1	1	1	2	-0	-4	-2	
Total demand	4,004	3,735	*-6.7*	964	937	958	1,146	1,020	962	852	902	853	*-16.3*
TRANSFORMATION	3,180	2,938	*-7.6*	742	746	768	925	801	758	683	696	673	*-16.0*
Coke manufacture	-	-		-	-	-	-	-	-	-	-	-	
Blast furnaces	3,180	2,938	*-7.6*	742	746	768	925	801	758	683	696	673	*-16.0*
Energy industry use	-	-		-	-	-	-	-	-	-	-	-	
FINAL CONSUMPTION	824	797	*-3.2*	222	191	190	221	218	204	169	206	181	*-17.3*
Iron & steel	466	423	*-9.2*	116	112	111	127	110	116	97	100	96	*-12.9*
Other industries	78	53	*-32.3*	20	20	17	21	20	15	7	12	7	*(-)*
Domestic	280	321	*+14.8*	86	59	61	73	88	73	65	95	78	*-11.8*
Stocks at end of period[2]	527	2,195	*-6.8*	617	651	581	527	455	468	603	669	683	*+50.2*

1. Stock fall (+), stock rise (-).
2. For some quarters, closing stocks may not be consistent with stock changes, due to additional stock adjustments
3. Percentage change in the first quarter of 2011 compared with a year earlier.

2 SOLID FUEL AND DERIVED GASES

Table 2.3 Supply and consumption of coke oven gas, blast furnace gas, benzole and tars

GWh

	2009	2010 p	*per cent change*	2009 1st quarter	2009 2nd quarter	2009 3rd quarter	2009 4th quarter	2010 1st quarter	2010 2nd quarter	2010 3rd quarter	2010 4th quarter	2011 1st quarter p	*per cent change* [1]
SUPPLY													
Indigenous production	20,912	21,643	*+3.5*	4,739	4,876	5,422	5,875	5,466	5,799	5,324	5,054	5,586	*+2.2*
Coke oven gas	8,010	8,636	*+7.8*	1,935	1,972	1,964	2,138	2,088	2,327	2,208	2,014	2,506	*+20.0*
Blast furnace gas	11,366	11,404	*+0.3*	2,425	2,524	3,087	3,329	2,994	3,029	2,709	2,672	2,677	*-10.6*
Benzole & tars	1,536	1,603	*+4.4*	378	379	371	408	385	443	407	368	403	*+4.7*
Transfers	354	263	*-25.7*	38	123	82	111	111	28	66	58	32	*(-)*
Total supply	21,266	21,906	*+3.0*	4,776	4,999	5,504	5,986	5,577	5,826	5,390	5,112	5,599	*+0.4*
Statistical difference	-47	+4		-7	-11	-15	-14	+6	+2	-4	-0	-38	
Total demand	21,312	21,902	*+2.8*	4,783	5,010	5,519	6,000	5,571	5,824	5,395	5,113	5,638	*+1.2*
TRANSFORMATION	9,576	8,812	*-8.0*	1,934	2,316	2,644	2,682	2,307	2,154	2,179	2,171	1,919	*-16.8*
Electricity generation	8,978	8,215	*-8.5*	1,785	2,167	2,494	2,532	2,158	2,005	2,030	2,022	1,770	*-18.0*
Heat generation [2]	598	598	-	149	149	149	149	149	149	149	149	149	-
Energy industry use	8,213	7,909	*-3.7*	1,882	1,958	2,110	2,263	2,070	2,001	1,916	1,922	1,901	*-8.2*
Losses	809	1,727	*(+)*	360	81	141	227	354	675	487	211	416	*+17.7*
FINAL CONSUMPTION	2,714	3,454	*+27.2*	607	655	624	829	840	994	812	808	1,402	*+66.8*
Iron & steel	949	1,652	*+74.1*	171	223	193	361	403	506	352	392	969	*(+)*
Other industries	1,765	1,801	*+2.0*	436	432	430	467	437	488	459	417	433	*-1.0*

1. Percentage change in the first quarter of 2011 compared with a year earlier.

2. For Heat generation, the 2010 figures currently shown are the 2009 figures carried forward - these will be updated in July 2011.

3 OIL AND OIL PRODUCTS

Table 3.1 Supply and use of crude oil, natural gas liquids and feedstocks[1]

Thousand tonnes

	2009	2010 p	*per cent change*	2009 1st quarter	2009 2nd quarter	2009 3rd quarter	2009 4th quarter	2010 1st quarter	2010 2nd quarter	2010 3rd quarter	2010 4th quarter	2011 1st quarter p	*per cent change*[8]
SUPPLY													
Indigenous production[2]	68,199	62,962r	*-7.7*	18,268	17,976	14,936	17,018	17,197r	15,985r	14,185r	15,595r	14,523	*-15.5*
Crude oil	62,820	58,047r	*-7.6*	16,758	16,502	13,870	15,690	15,816r	14,677r	13,106r	14,447r	13,553	*-14.3*
NGLs[3]	5,378	4,915	*-8.6*	1,510	1,474	1,067	1,328	1,381	1,307	1,079	1,148	971	*-29.7*
Imports[4]	54,387r	54,587r	*+0.4*	13,181r	13,180r	14,555r	13,471	12,430r	14,639r	13,617r	13,901r	13,749	*+10.6*
Crude oil & NGLs	47,664	48,081r	*+0.9*	11,434	11,553	12,599	12,078	11,076	13,050	12,010	11,945	11,912	*+7.5*
Feedstocks	6,723r	6,505r	*-3.2*	1,747r	1,627r	1,957r	1,393	1,354r	1,588r	1,607r	1,956	1,837	*+35.7*
Exports[4]	45,202	42,196r	*-6.6*	11,193	12,639	9,605	11,766	11,476	11,161	8,742r	10,818r	8,881	*-22.6*
Crude Oil & NGLs	41,803	39,239r	*-6.1*	10,457	12,041	8,745	10,560	10,777	10,338	8,039	10,086r	8,012	*-25.7*
Feedstocks	3,399	2,957r	*-13.0*	736	597	860	1,206	700	823	703r	732	869	*+24.2*
Stock change[5]	+545r	-39r		-166r	+478r	+31r	+201	-95r	-553r	+184r	+426r	-506	
Transfers[6]	-2,601r	-2,074r		-604	-791	-599r	-607	-508r	-635	-483r	-449r	-551	
Total supply	75,327r	73,239r	*-2.8*	19,486r	18,204r	19,319r	18,319	17,548	18,274r	18,761r	18,656r	18,334	*+4.5*
Statistical difference[7]	+102r	+39r		-113r	+137r	-80r	+158	+90r	-48r	-92r	+89r	+236	
Total demand	75,225r	73,200r	*-2.7*	19,598r	18,068	19,398	18,161	17,458r	18,322r	18,854r	18,566r	18,098	*+3.7*
TRANSFORMATION	75,225r	73,200r	*-2.7*	19,598r	18,068	19,398	18,161	17,458r	18,322r	18,854r	18,566r	18,098	*+3.7*
Petroleum refineries	75,225r	73,200r	*-2.7*	19,598r	18,068	19,398	18,161	17,458r	18,322r	18,854r	18,566r	18,098	*+3.7*
Energy industry use	-	-		-	-	-	-	-	-	-	-	-	

1. As there is no use made of primary oils and feedstocks by industries other than the oil and gas extraction and petroleum refining industries, other industry headings have not been included in this table. As such, this table is a summary of the activity of what is known as the Upstream oil industry.
2. Includes offshore and onshore production.
3. Natural Gas Liquids (NGLs) are condensate and petroleum gases derived at onshore treatment plants.
4. Foreign trade as recorded by the Petroleum Industry which may differ from the figures published by HM Revenue and Customs in the Overseas Trade Statistics. Data are subject to further revision as revised information on imports and exports becomes available.
5. Stock fall (+), stock rise (-). Stocks include stocks held at refineries, at oil terminals and also those held in tanks and partially loaded vessels at offshore facilities.
6. Mostly direct disposals to petrochemical plants.
7. Total supply minus total demand.
8. Percentage change in the first quarter of 2011 compared with a year earlier.

3 OIL AND OIL PRODUCTS

Table 3.2 Supply and use of petroleum products

Thousand tonnes

	2009	2010 p	*per cent change*	2009 1st quarter	2009 2nd quarter	2009 3rd quarter	2009 4th quarter	2010 1st quarter	2010 2nd quarter	2010 3rd quarter	2010 4th quarter	2011 1st quarter p	*per cent change* [1]
SUPPLY													
Indigenous production [2]	77,511r	75,177r	*-3.0r*	20,056r	18,855r	19,950r	18,650r	17,763r	18,807r	19,414r	19,193r	18,789	*+5.8*
Imports [3]	22,407r	24,210r	*+8.0r*	5,918r	5,185r	5,577r	5,727r	6,484r	5,541r	5,963r	6,222r	5,726	*-11.7*
Exports [3]	25,733	26,065r	*+1.3r*	6,648	6,064	6,512	6,510	6,192r	6,200r	6,669r	7,005r	6,621	*+6.9*
Marine bunkers	2,490	2,139r	*-14.1r*	528	677	629	656	470	534	597	539r	554	*+18.0*
Stock change [4]	+320r	+603r		-102r	+471	-242	+193	+303	-43r	+75r	+268r	+279	
Transfers [5]	-16	-232r		-22	+52	-4	-42	-52r	-43r	-63r	-74r	-14	
Total supply	71,999r	71,555r	*-0.6r*	18,674r	17,822r	18,140r	17,362r	17,836r	17,529r	18,124r	18,065r	17,604	*-1.3*
Statistical difference [6]	+37r	-136r		+59	+75	-8	-89	+7	-143r	-16r	+17r	-54	
Total demand	71,962r	71,691r	*-0.4r*	18,615r	17,748r	18,148r	17,451r	17,829r	17,672r	18,140r	18,049r	17,658	*-1.0*
TRANSFORMATION	1,783r	1,343r	*-24.7r*	494r	387r	403r	499r	410r	268r	316r	348r	299	*-27.1*
Electricity generation	1,560r	1,138r	*-27.0r*	439r	334r	350r	438r	355r	214r	265r	305r	248	*-30.0*
Heat generation	62r	63r	*+1.6r*	15r	15r	16r	16r	16r	16r	16r	16r	14	*-8.7*
Blast furnaces	162	142	-	40	39	37	46	39	39	36	28	36	*-7.6*
Energy industry use	4,849r	4,967r	*+2.4r*	1,291r	1,168r	1,178r	1,214r	1,080r	1,243r	1,327r	1,317r	1,236r	*+14.4*
Petrolem Refineries	4,399r	4,478r	*+1.8r*	1,178	1,055	1,065	1,101	958r	1,121r	1,205r	1,194r	1,146	*+19.6*
Blast Furnaces	-	-		-	-	-	-	-	-	-	-	-	
Others	450r	490r	*+8.8r*	113r	113r	113r	113r	122r	122r	122r	122r	90	*-26.5*
FINAL CONSUMPTION	65,329r	65,380r	*+0.1r*	16,831r	16,193r	16,568r	15,738r	16,339r	16,161r	16,497r	16,384r	16,124	*-1.3*
Iron & steel	52	56r	*+7.8r*	18	13	9	12	25r	13r	10r	9r	23	*-7.6*
Other industries	4,453r	4,473r	*+0.4r*	1,191r	968r	1,159r	1,134r	1,153r	965r	1,075r	1,279r	1,067	*-7.5*
Transport	49,601r	49,087r	*-1.0r*	12,442r	12,456r	12,920r	11,783r	11,987r	12,201r	12,953r	11,945r	12,056	*+0.6*
Domestic	2,713	3,083r	*+13.6r*	934	475	418	886	1,104r	513r	398r	1,068r	863	*-21.8*
Other final users	1,145r	1,155r	*+0.9r*	362r	319r	234r	230r	310r	300r	223r	323r	268	*-13.5*
Non energy use	7,365r	7,527r	*+2.2r*	1,883r	1,961r	1,828r	1,692r	1,761r	2,169r	1,837r	1,760r	1,847	*+4.9*

1. Percentage change in the first quarter of 2011 compared with a year earlier.
2. Includes refinery production and petroleum gases extracted as products during the production of oil and gas.
3. Foreign trade as recorded by the Petroleum Industry which may differ from the figures published by HM Revenue and Customs in the Overseas Trade Statistics. Data are subject for further revision as revised information on imports and exports becomes available.
4. Stock fall (+), stock rise (-).
5. Mainly transfers from product to feedstock.
6. Total supply minus total demand.

3 OIL AND OIL PRODUCTS

Table 3.3 Supply and use of petroleum products - annual data

Thousand tonnes

	2009									2010 p								
	Total Petroleum Products	Motor spirit	DERV [9]	Gas oil [1]	Aviation turbine fuel	Fuel oils	Petroleum gases [2]	Burning oil	Other products [3]	Total Petroleum Products	Motor spirit	DERV [9]	Gas oil [1]	Aviation turbine fuel	Fuel oils	Petroleum gases [2]	Burning oil	Other products [3]
SUPPLY																		
Indigenous production [4]	77,511r	20,404	15,906	9,487	6,022	8,641	7,171	2,830	7,050r	75,177r	19,918r	15,332	9,505	5,781r	7,525	7,283r	2,570r	7,264r
Imports [5]	22,407r	2,966	5,865	751	7,532r	1,243r	513r	668	2,869r	24,210r	3,341r	7,738	705	7,353r	1,020r	362r	972r	2,718r
Exports [5]	25,733	7,811	1,850	4,183	1,451	5,547	659	241	3,992	26,065r	8,619r	2,121	4,358	1,487r	4,895	732r	191	3,662r
Marine bunkers	2,490	-	-	716	-	1,774	-	-	-	2,139	-	-	807	-	1,332	-	-	-
Stock change [6]	+320r	+30	+173	-15	-7	+82	+14	+4	+40r	+603r	299r	+61	+95	+116	+115	-15	-5	-63r
Transfers [7]	-16	+198	-4	+39	-485	-74	-	+487	-177	-232r	-30r	-180	+81	-649r	-15	-	655r	-94r
Total supply	71,999r	15,787	20,090	5,362	11,612r	2,570r	7,039r	3,749	5,789r	71,555r	14,910r	20,831	5,220	11,109r	2,419r	6,898r	4,000r	6,168r
Statistical difference [8]	+37r	+25	+34	+10	+79	-26r	+56r	+17r	-158r	-136r	-79r	-42	-8	60r	16r	-20r	-12r	-51r
Total demand	71,962r	15,762	20,057	5,353	11,533r	2,596r	6,983	3,732	5,947r	71,691r	14,988r	20,873	5,228	11,116r	2,403r	6,918r	4,012r	6,152r
TRANSFORMATION	1,783r	-	-	67	-	913r	301r	-	502	1,343r	-	-	70	-	733r	329r	-	210r
Electricity generation	1,560r	-	-	62	-	700r	296	-	502	1,138r	-	-	65	-	539r	324r	-	210r
Heat generation	62r	-	-	5	-	52	5r	-	-	63r	-	-	5	-	52	5	-	-
Petroleum refineries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Coke manufacture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blast furnaces	162	-	-	-	-	162	-	-	-	142	-	-	-	-	142r	-	-	-
Patent fuel manufacture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Energy industry use	4,849r	-	-	450	-	677	2,313	-	1,410	4,967r	-	-	490	-	613r	2,463r	-	1,401
FINAL CONSUMPTION	65,329r	15,762	20,057	4,835	11,533r	1,005r	4,370r	3,732r	4,035r	65,380r	14,988r	20,873	4,669	11,116r	1,056r	4,125r	4,012r	4,541r
Iron & steel	52	-	-	-	-	52	-	-	-	56r	-	-	-	-	56r	-	-	-
Other industries	4,453r	-	-	2,096	-	251r	644r	1,462r	-	4,473r	-	-	2,072	-	273r	639r	1,489r	-
Transport	49,601r	15,762	20,057	1,532	11,533r	588r	107	-	22	49,087r	14,988r	20,873	1,370	11,116r	611r	106	-	21
Domestic	2,713	-	-	131	-	-	311	2,270	-	3,083r	-	-	165	-	-	394	2,523r	-
Other final users	1,145r	-	-	933	-	114r	98	-	-	1,155r	-	-	919	-	116r	120	-	-
Non energy use	7,365r	-	-	143	-	-	3,209r	-	4,013r	7,527r	-	-	142	-	-	2,865r	-	4,519r

1. Includes: Middle distillate feedstock destined for use in the petrochemical industry and marine diesel o
2. Includes ethane, propane, butane and other petroleum gases.
3. Includes naphtha, industrial and white spirits, lubricants, bitumen, petroleum waxes, petroleum coke and other oil products.
4. Includes refinery production and petroleum gases extracted as products during the production of oil and gas.
5. Foreign trade as recorded by the Petroleum Industry which may differ from the figures published by HM Revenue and Customs in the Overseas Trade Statistic
   Data are subject to further revision as revised information on imports and exports becomes available.
6. Stock fall (+), stock rise (-).
7. Mainly transfers from product to feedstock.
8. Total supply minus total demand.
9. See page 15 of the March 2011 edition of Energy Trends for a note concerning changes to this table.

3 OIL AND OIL PRODUCTS

Table 3.4 Supply and use of petroleum products - latest quarter

Thousand tonnes

	2010 1st quarter									2011 1st quarter p								
	Total Petroleum Products	Motor spirit	DERV[9]	Gas oil[1]	Aviation turbine fuel	Fuel oils	Petroleum gases[2]	Burning oil	Other products[3]	Total Petroleum Products	Motor spirit	DERV[9]	Gas oil[1]	Aviation turbine fuel	Fuel oils	Petroleum gases[2]	Burning oil	Other products[3]
SUPPLY																		
Indigenous Production[4]	17,763r	4,764r	3,446r	2,055r	1,196r	1,811r	1,676r	962r	1,853r	18,789	4,621	4,093	2,129	1,311	2,107	1,821	742	1,965
Imports[5]	6,484r	866r	2,118r	210r	1,998r	252r	105r	305r	629r	5,726	927	1,848	256	1,847	168	84	231	365
Exports[5]	6,192r	1,973r	367r	817r	459r	1,152r	152r	92r	1,180r	6,621	2,042	740	1,080	251	1,324	187	45	952
Marine bunkers	470r	-	-	168	-	302	-	-	-	554	-	-	164	-	391	-	-	-
Stock change[6]	+303r	+29r	+51r	+89r	+50r	-9r	+16r	-5r	+82r	+279	+27	+149	+18	+55	-79	+1	-7	+114
Transfers[7]	-52r	-20r	-14r	+2r	-254r	-10r	-	+256r	-13r	-14	-22	-142	+128	-232	+9	-	+243	+2
Total supply	17,836r	3,666r	5,235r	1,372r	2,531r	590r	1,644r	1,426r	1,371r	17,604	3,511	5,207	1,288	2,731	490	1,719	1,163	1,494
Statistical difference[8]	+7r	-9r	+14r	+4r	+8r	+10r	-11r	-0r	-10r	-54	-24	-33	-8	+13	-7	-15	-1	+22
Total demand	17,829r	3,675r	5,221r	1,368r	2,523r	581r	1,655r	1,426r	1,381r	17,658	3,536	5,240	1,296	2,718	497	1,734	1,165	1,472
TRANSFORMATION	410r	-	-	20r	-	216r	82r	-	-	300	-	-	20	-	155	82	-	-
Electricity generation	355r	-	-	19r	-	164r	81r	-	-	248	-	-	19	-	106	81	-	-
Heat generation	16r	-	-	1r	-	13r	1r	-	-	16	-	-	1	-	13	1	-	-
Petroleum refineries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Coke manufacture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blast furnaces	39r	-	-	-	-	39r	-	-	-	36	-	-	-	-	36	-	-	-
Patent fuel manufacture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Energy industry use	1,080r	-	-	122r	-	122r	567r	-	269r	1,236	-	-	89	-	162	639	-	346
FINAL CONSUMPTION	16,339r	3,675r	5,221r	1,226r	2,523r	242r	1,006r	1,426r	1,020r	16,123	3,536	5,240	1,187	2,718	181	1,013	1,165	1,083
Iron & steel	25r	-	-	-	-	25r	-	-	-	23	-	-	-	-	23	-	-	-
Other industries	1,153r	-	-	467r	-	77r	103r	506r	-	1,066	-	-	456	-	17	127	466	-
Transport	11,987r	3,675r	5,221r	425r	2,523r	111r	28r	-	4r	12,056	3,536	5,240	421	2,718	115	22	-	4
Domestic	1,104r	-	-	45r	-	-	138r	921r	-	863	-	-	44	-	-	120	699	-
Other final users	310r	-	-	243r	-	30r	37r	-	-	268	-	-	207	-	25	36	-	-
Non energy use	1,761r	-	-	45r	-	-	700r	-	1,016r	1,847	-	-	60	-	-	708	-	1,079

1. Includes middle distillate feedstock destined for use in the petrochemical industry and marine diesel
2. Includes ethane, propane, butane and other petroleum gases.
3. Includes naphtha, industrial and white spirits, lubricants, bitumen, petroleum waxes, petroleum coke and other oil products.
4. Includes refinery production and petroleum gases extracted as products during the production of oil and gas.
5. Foreign trade as recorded by the Petroleum Industry which may differ from the figures published by HM Revenue and Customs in the Overseas Trade Statistics. Data are subject to further revision as revised information on imports and exports becomes available.
6. Stock fall (+), stock rise (-).
7. Mainly transfers from product to feedstock.
8. Total supply minus total demand.
9. See page 15 of the March 2011 edition of Energy Trends for a note concerning changes to this table.

3 OIL AND OIL PRODUCTS

Table 3.5 Demand for key petroleum products[1]

Thousand tonnes

	2009	2010 p	*per cent change*	2009 1st quarter	2009 2nd quarter	2009 3rd quarter	2009 4th quarter	2010 1st quarter	2010 2nd quarter	2010 3rd quarter	2010 4th quarter	2011 1st quarter p	*per cent change* [2]
MOTOR SPIRIT													
Total sales	15,762	14,989	*-4.9*	3,885	4,103	4,034	3,740	3,675r	3,841r	3,831r	3,642r	3,536	*-3.8*
By seller:													
Retail sales: [3]	15,194	14,463	*-4.8*	3,753	3,952	3,881	3,608	3,551r	3,699r	3,699r	3,514r	3,419	*-3.7*
hypermarkets [4]	6,223	5,710	*-8.2*	1,523	1,562	1,598	1,540	1,388r	1,466	1,446	1,410r	1,371	*-1.2*
refiners/other traders	8,970	8,753	*-2.4*	2,230	2,390	2,283	2,068	2,163r	2,233r	2,252r	2,104r	2,048	*-5.3*
Commercial sales [5]	568	526	*-7.5*	132	151	153	132	124r	142r	133r	128r	117	*-5.5*
By grade:													
4-Star/Leaded/LRP [6]	11	11	*+1.8*	2	3	3	3	3r	3r	3r	3r	3	*-2.4*
Super Premium Unleaded	859	759	*-11.7*	233	204	172	251	159r	140r	153r	307r	149	*-6.0*
Premium Unleaded/ULSP [7]	14,892	14,219	*-4.5*	3,650	3,897	3,859	3,487	3,513r	3,698r	3,675r	3,332r	3,384	*-3.7*
GAS DIESEL OIL													
Total sales	25,409	26,101	*+2.7*	6,490r	6,186r	6,588r	6,145r	6,589r	6,343r	6,750r	6,419r	6,538	*-0.8*
DERV fuel	20,057	20,873	*+4.1*	5,048	4,943	5,140	4,926	5,221r	5,118r	5,361r	5,173r	5,240	*+0.4*
Retail sales: [3]	12,614	13,251	*+5.0*	3,149	3,112	3,263	3,090	3,200r	3,219r	3,587r	3,246r	3,216	*+0.5*
hypermarkets [4]	4,447	4,781	*+7.5*	1,063	1,080	1,157	1,147	1,129	1,190	1,228	1,233r	1,224	*+8.4*
refiners/other traders	8,167	8,470	*+3.7*	2,086	2,032	2,106	1,944	2,070r	2,028r	2,358r	2,013r	1,992	*-3.8*
Commercial sales [5]	7,443	7,623	*+2.4*	1,899	1,831	1,877	1,835	2,022r	1,900r	1,774r	1,927r	2,024	*+0.1*
Other gas diesel oil [8]	5,353	5,228	*-2.3*	1,442r	1,243r	1,448r	1,219r	1,368r	1,225r	1,388r	1,247r	1,297	*-5.2*
AVIATION FUELS													
Total sales	11,555	11,137	*-3.6*	2,804r	2,942	3,146	2,662	2,527r	2,776	3,230r	2,604r	2,722	*+7.7*
Aviation spirit	22	21	*-3.5*	3	7	7	5	4r	6	7r	4r	4	*-10.1*
Aviation turbine fuel	11,533	11,116	*-3.6*	2,801r	2,935	3,139	2,658	2,523r	2,770	3,223r	2,600r	2,718	*+7.7*
FUEL OIL													
Total Sales	1,919	1,790	*-6.7*	559r	464r	428r	469r	458r	442r	317r	572r	335	*-26.8*
Light	374	684	*+82.9*	113r	79r	70r	111r	132r	86r	131r	334r	133	*+1.1*
Medium	186	119	*-35.9*	48r	66r	44r	28r	43r	16r	37r	23r	35	*-19.6*
Heavy	1,359	987	*-27.4*	397r	319r	314r	330r	283r	340r	150r	214r	167	*-41.0*

1. Monthly data for inland deliveries of oil products are available - See DECC website: www.decc.gov.uk/en/content/cms/statistics/source/oil/oil.aspx
2. Percentage change in the first quarter of 2011 compared with a year earlier.
3. Retail sales are those deliveries made to garages etc. mainly for resale to final consumers.
4. Data for sales by hypermarket companies are collected by a separate reporting system, but are consistent with the main data collected from companies.
5. Commercial sales are those deliveries made direct to a consumer for use in their own business, e.g. to bus and coach depots.
6. Sales of leaded petrol ceased from 31st December 1999, with Lead Replacement Petrol being introduced as a replacement fuel.
7. ULSP is Ultra Low Sulphur Petrol introduced during the second half of 2000 and first half of 2001 as a replacement for ordinary Premium grade unleaded petrol.
8. This includes gas diesel oil used for other purposes such as heating and middle distillate feedstock destined for use in the petrochemical industry.

3 OIL AND OIL PRODUCTS

Table 3.6 Stocks of petroleum[1] at end of period

Thousand tonnes

		Crude oil and refinery process oil				Petroleum products					Total stocks		
		Refineries[2]	Terminals[3]	Offshore[4]	Total[5]	Light distillates[6]	Kerosene & gas/diesel[7]	Fuel oils	Other products[8]	Total products	Net bilaterals[9]	Stocks in UK[10]	Total stocks
2008		4,616	1,092	664	6,787	1,089	5,683	839	1,545	9,156	2,104	13,840	15,943
2009		3,848	1,136	682	6,033	1,157	6,276	927	1,555	9,915	2,728	13,221	15,948
2010 p		4,110	1,049	520r	5,889r	1,144	5,435r	817	1,509r	8,906r	2,563r	12,232r	14,795r
Per cent change		*+6.8*	*-7.6*	*-23.7*	*-2.4*	*-1.1*	*-13.4*	*-11.9*	*-2.9*	*-10.2*	*-6.0*	*-7.5*	*-7.2*
2009	1st quarter	4,453	1,397	637	6,902	974	6,096	909	1,632	9,611	2,427	14,087	16,514
	2nd quarter	4,214	1,176	482	6,295	823	6,029	948	1,591	9,391	2,800	12,885	15,686
	3rd quarter	4,015	1,130	702	6,314	967	6,268	1,061	1,636	9,932	2,905	13,341	16,246
	4th quarter	3,848	1,136	682	6,033	1,157	6,276	927	1,555	9,915	2,728	13,221	15,948
2010	1st quarter	3,743r	1,544	472	6,176r	1,150	5,800r	950r	1,476	9,376r	2,565	12,987r	15,552r
	2nd quarter	4,283r	1,571	449	6,811r	1,060	5,924r	1,012r	1,473	9,469r	2,858	13,422r	16,280r
	3rd quarter	4,133r	1,327r	617r	6,257r	1,212	5,928r	827r	1,540	9,507r	2,841	12,923r	15,764r
	4th quarter	4,110r	1,049r	520r	5,889r	1,144r	5,435r	817r	1,509r	8,906r	2,563r	12,232r	14,795r
2011	1st quarter p	4,402r	1,388r	583r	6,488r	1,102r	5,326r	880r	1,407r	8,715r	2,516r	12,686r	15,203r
Per cent change[11]		*+17.6*	*-10.1*	*+23.4*	*+5.0*	*-4.2*	*-8.2*	*-7.4*	*-4.7*	*-7.1*	*-1.9*	*-2.3*	*-2.2*

1. Stocks held at refineries, terminals and power stations. Stocks in the wholesale distribution system and certain stocks at offshore fields (UK Continental Shelf [UKCS]), and others held under approved bilateral agreements are also included.
2. Stocks of crude oil, NGLs and process oil at UK refineries.
3. Stocks of crude oil and NGLs at UKCS pipeline terminals.
4. Stocks of crude oil in tanks and partially loaded tankers at offshore field (UKCS).
5. Includes process oils held under approved bilateral agreements.
6. Motor spirit and aviation spirit.
7. Aviation turbine fuel, burning oil, gas oil, DERV fuel, middle distillate feedstock (mdf) and marine diesel oil.
8. Ethane, propane, butane, other petroleum gases, naphtha (ldf), industrial white spirit, bitumen, petroleum wax, lubricating oil, petroleum coke and miscellaneous products.
9. The difference between the stocks held abroad for UK use under approved bilateral agreements and the equivalent stocks held in the UK for foreign use.
10. Stocks held in the national territory or elsewhere on the UKCS.
11. Percentage change in the first quarter of 2011 compared with a year earlier.

3 OIL AND OIL PRODUCTS

Table 3.7 Drilling activity[1] on the UKCS

Number of wells started

		Offshore				Onshore	
				Exploration &		Exploration &	
		Exploration	Appraisal	Appraisal	Development[2]	Appraisal	Development[2]
2008		44	61	105	170	20	20
2009		23	41	64	131	15	11
2010 p		28	34	62	130	9	12
Per cent change		*+21.7*	*-17.1*	*-3.1*	*-0.8*	*-40.0*	*+9.1*
2009	1st quarter	3	12	15	31	4	3
	2nd quarter	6	8	14	43	3	4
	3rd quarter	8	16	24	29	4	2
	4th quarter	6	5	11	28	4	2
2010	1st quarter	7	4	11	31	-	2
	2nd quarter	8	13	21	37	2	4
	3rd quarter	9	12	21	30	6	3
	4th quarter	4	5	9	32	1	3
2011	1st quarter p	3	5	8	34	1	3
Per cent change[3]		*-57.1*	*+25.0*	*-27.3*	*+9.7*	-	*+50.0*

1. Including sidetracked wells

2. Development wells are production or injection wells drilled after development approval has been granted.

3. Percentage change in the first quarter of 2011 compared with a year earlier

4 GAS

Table 4.1. Natural gas supply and consumption

GWh

	2009	2010 p	*per cent change*	2009 1st quarter	2009 2nd quarter	2009 3rd quarter	2009 4th quarter	2010 1st quarter	2010 2nd quarter	2010 3rd quarter	2010 4th quarter	2011 1st quarter p	*per cent change1*
SUPPLY													
Indigenous production	693,965	664,353r	*-4.3*	201,992	183,994	133,129	174,851	183,913	174,405	146,354	159,681r	151,385	*-17.7*
Imports	455,789	589,497	*+29.3*	140,286	83,142	78,580	153,780	183,844	128,234	91,049	186,370	181,011	*-1.5*
of which LNG	*110,579*	*203,789*	*+84.3*	*13,224*	*18,744*	*29,873*	*48,737*	*48,033*	*48,479*	*43,839*	*63,439*	*78,370*	*+63.2*
Exports	137,100	176,399r	*+28.7*	34,357	45,420	27,409	29,913	28,391	57,615	49,278	41,115r	24,880	*-12.4*
Stock change[2]	-4,876	+15,271		+19,930	-22,147	-8,763	+6,104	+32,558	-21,833	-13,945	+18,491	+6,805	
Transfers	-354	-263		-34	-124	-86	-110	-111	-28	-66	-58	-32	
Total supply	1,007,425	1,092,459r	*+8.4*	327,817	199,445	175,451	304,712	371,813	223,164	174,114	323,369r	314,289	*-15.5*
Statistical difference	317	2,077		+207	-847	+258	+698	-77	-50	+2,142	+62	-1,086	
Total demand	1,007,108	1,090,382	*+8.3*	327,610	200,292	175,193	304,013	371,891	223,213	171,971	323,307	315,374	*-15.2*
TRANSFORMATION	380,446	395,833	*+4.0*	89,307	88,155	96,533	106,452	109,250	101,992	90,813	93,778	87,939	*-19.5*
Electricity generation	355,730	371,117	*+4.3*	81,781	82,778	91,757	99,415	101,724	96,615	86,037	86,741	80,661	*-20.7*
Heat generation[3]	24,716	24,716	-	7,526	5,377	4,776	7,037	7,526	5,377	4,776	7,037	7,278	*-3.3*
Energy industry use	68,984	69,342	*+0.5*	18,787	17,992	14,859	17,347	19,151	18,166	15,178	16,848	16,691	*-12.8*
Losses	16,356	18,737	*+14.6*	4,608	3,394	3,149	5,205	6,491	4,695	3,245	4,306	4,389	*-32.4*
FINAL CONSUMPTION	541,322	606,470	*+12.0*	214,908	90,751	60,653	175,009	236,999	98,360	62,735	208,376	206,355	*-12.9*
Iron & steel	5,037	7,182	*+42.6*	1,200	1,137	1,293	1,407	1,769	1,794	1,766	1,854	1,617	*-8.6*
Other industries	109,384	117,432	*+7.4*	33,784	18,815	18,423	38,362	39,372	20,246	19,235	38,580	36,233	*-8.0*
Domestic	334,823	384,891	*+15.0*	146,022	52,958	28,763	107,079	158,632	58,049	29,343	138,866	134,007	*-15.5*
Other final users	83,099	87,985	*+5.9*	31,657	15,597	9,928	25,917	34,980	16,026	10,147	26,831	32,253	*-7.8*
Non energy use[3]	8,979	8,979	-	2,245	2,245	2,245	2,245	2,245	2,245	2,245	2,245	2,245	-

1. Percentage change in the first quarter of 2011 compared with a year earlier.

2. Stock fall (+), stock rise (-).

3. For Heat generation and non energy use, the 2010 figures currently shown are the 2009 figures carried forward - these will be updated in July 2011.

5 ELECTRICITY

Table 5.1. Fuel used in electricity generation and electricity supplied

	2009	2010 p	*per cent change*	2009 1st quarter	2009 2nd quarter	2009 3rd quarter	2009 4th quarter	2010 1st quarter	2010 2nd quarter	2010 3rd quarter	2010 4th quarter	2011 1st quarter p	*per cent change* [1]
FUEL USED IN GENERATION													
All generating companies												**Million tonnes of oil equivalent**	
Coal	24.69	25.95	*+5.1*	9.30	4.93	4.01	6.45	7.75	4.74	4.90	8.56	8.37	*+7.9*
Oil	1.55	1.07r	*-30.8*	0.55	0.29	0.31	0.41	0.33r	0.20	0.24r	0.30r	0.20	*-39.8*
Gas	30.63	31.96	*+4.3*	7.04	7.13	7.90	8.56	8.76	8.32	7.41	7.47	6.95	*-20.6*
Nuclear	15.23	13.95r	*-8.4*	3.74	3.99	3.91	3.59	4.08r	3.12r	2.92r	3.83r	4.37	*+6.9*
Hydro	0.45	0.31	*-31.3*	0.13	0.08	0.10	0.14	0.07	0.06	0.07r	0.10r	0.11	*+56.2*
Wind [2]	0.80	0.88r	*+9.6*	0.23	0.17	0.18	0.22	0.21r	0.14	0.24r	0.29r	0.29	*+37.0*
Other renewables [3]	4.02	4.44r	*+10.7*	1.06	0.95	0.93	1.07	1.09r	1.11r	1.14r	1.10r	1.21	*+10.4*
Other fuels	0.85	0.78	*-7.8*	0.20	0.20	0.21	0.24	0.23	0.18	0.20	0.17	0.18	*-24.5*
Net imports	0.25	0.23	*-6.9*	0.05	0.24	0.07	-0.11	-0.15	0.12	0.24	0.02	0.09	*(-)*
Total all generating companies	78.47	79.57r	*+1.4*	22.30	17.96	17.63	20.58	22.39r	17.98r	17.37r	21.83r	21.76	*-2.8*
ELECTRICITY GENERATED													
All generating companies												**TWh**	
Coal	104.61	108.68	*+3.9*	40.12	20.45	16.82	27.22	33.00r	19.66r	20.07	35.94r	35.33	*+7.1*
Oil	4.37	3.45r	*-21.1*	1.59	0.69	0.61	1.47	0.98r	0.72r	0.76r	0.99r	0.59	*-39.7*
Gas	165.48	175.56r	*+6.1*	37.63	38.23	43.44	46.18	48.32r	45.46	40.66	41.12	38.79	*-19.7*
Nuclear	69.10	62.14	*-10.1*	16.98	18.10	17.73	16.29	18.19	13.88	13.02	17.05	19.45	*+6.9*
Hydro (natural flow)	5.26	3.60r	*-31.5*	1.58	0.93	1.14	1.61	0.84	0.67r	0.87r	1.22r	1.31	*+56.0*
Wind [2]	9.32	10.22r	*+9.6*	2.63	1.96	2.09	2.64	2.45r	1.65	2.74	3.38r	3.35	*+37.0*
- of which, Offshore	1.74	3.04r	*+74.9*					0.67	0.46	0.82	1.10	0.99	*+48.2*
Other renewables [3]	11.51	12.84r	*+11.5*	3.05	2.75	2.71	3.00	3.21r	3.14r	3.30r	3.20r	3.58	*+11.8*
Pumped Storage	3.69	3.15	*-14.5*	1.03	0.82	0.91	0.92	0.86	0.76	0.71	0.82	0.77	*-10.9*
Other fuels	2.33	2.15	*-7.8*	0.60	0.53	0.63	0.57	0.57	0.52	0.56	0.50	0.45	*-20.0*
Total all generating companies	375.66	381.77r	*+1.6*	105.20	84.47	86.08	99.91	108.41r	86.47r	82.68r	104.22r	103.63	*-4.4*
ELECTRICITY SUPPLIED [4]													
All generating companies												**TWh**	
Coal	99.29	103.18r	*+3.9*	38.08	19.41	15.97	25.83	31.33r	18.67r	19.06r	34.12r	33.55	*+7.1*
Oil	3.82	3.04r	*-20.5*	1.36	0.61	0.54	1.32	0.85r	0.64r	0.68r	0.86r	0.52	*-39.2*
Gas	162.46	171.19r	*+5.4*	36.91	37.52	42.64	45.39	47.13r	44.36r	39.65r	40.04r	37.73	*-19.9*
Nuclear	62.76	56.44	*-10.1*	15.42	16.44	16.10	14.80	16.52	12.61	11.82	15.49	17.67	*+6.9*
Hydro	5.23	3.58r	*-31.6*	1.57	0.92	1.14	1.60	0.83r	0.67r	0.86r	1.21	1.30	*+56.1*
Wind [2]	9.32	10.22r	*+9.6*	2.63	1.96	2.09	2.64	2.45r	1.65r	2.74r	3.38r	3.35	*+37.0*
- of which, Offshore	1.74	3.04r	*+74.9*					0.67	0.46	0.82r	1.10r	0.99	*+48.2*
Other renewables [3]	10.39	11.89r	*+14.5*	2.75	2.48	2.44	2.71	2.97r	2.91r	3.05r	2.96r	3.31	*+11.4*
Pumped Storage (net supply) [5]	-1.17	-1.07		-0.34	-0.26	-0.29	-0.28	-0.29	-0.27	-0.23	-0.28	-0.26	
Other fuels	2.25	2.07	*-7.8*	0.58	0.51	0.61	0.55	0.55	0.50	0.54	0.49	0.44	*-20.0*
Net imports	2.86	2.66	*-6.9*	0.57	2.78	0.81	-1.30	-1.69	1.42	2.76	0.18	1.06	*(-)*
Total all generating companies	357.21	363.20r	*+1.7*	99.52	82.38	82.05	93.26	100.65r	83.16r	80.95r	98.45r	98.68	*-2.0*

1. Percentage change in the first quarter of 2011 compared with a year earlier.

2. Includes solar PV and wave/tidal

3. Includes non-biodegradable wastes

4. Electricity supplied net of electricity used in generation

5. Net supply from pumped storage is usually negative, as electricity used in pumping is deducted.

5 ELECTRICITY

Table 5.2 Supply and consumption of electricity

GWh

	2009	2010 p	*Per cent change*	2009 1st quarter	2009 2nd quarter	2009 3rd quarter	2009 4th quarter	2010 1st quarter	2010 2nd quarter	2010 3rd quarter	2010 4th quarter	2011 1st quarter p	*Per cent change* [1]
SUPPLY													
Indigenous production	375,665	381,772r	*+1.6*	105,204	84,468	86,084	99,908	108,411r	86,465r	82,677r	104,218r	103,627	*-4.4*
Major power producers [2] [3]	337,782	344,519r	*+2.0*	95,074	75,597	76,868	90,243	98,420r	77,562r	73,808r	94,729r	93,310	*-5.2*
Auto producers	34,197	34,103r	*-0.3*	9,099	8,048	8,308	8,741	9,126r	8,141r	8,165r	8,671r	9,546	*+4.6*
Other sources [4]	3,685	3,150	*-14.5*	1,031	823	907	924	865	763	705	818	770	*-10.9*
Imports	6,609	7,144	*+8.1*	1,402	2,985	1,520	702	698	2,025	2,943	1,479	1,787	*(+)*
Exports	3,748	4,481	*+19.5*	836	204	709	1,999	2,384	610	184	1,303	723	*-69.7*
Transfers	-	-		-	-	-	-	-	-	-	-	-	
Total supply	378,526	384,435r	*+1.6*	105,770	87,249	86,896	98,611	106,724r	87,881r	85,436r	104,394r	104,691	*-1.9*
Statistical difference	-194	-152r		49	-429	245	-58	-159r	23r	-15r	-1r	-377	
Total demand	378,719	384,587r	*+1.5*	105,721	87,678	86,651	98,669	106,883r	87,858r	85,451r	104,394r	105,068	*-1.7*
TRANSFORMATION	-	-		-	-	-	-	-	-	-	-	-	
Energy industry use [5]	29,609	29,164r	*-1.5*	8,351	6,913	6,883	7,461	8,111r	6,684r	6,455r	7,915r	8,070	*-0.5*
Losses	26,911	28,769	*+6.9*	7,597	6,817	6,534	5,963	7,577	6,968	6,902	7,323	8,097	*+6.9*
FINAL CONSUMPTION	322,199	326,653r	*+1.4*	89,773	73,948	73,233	85,244	91,195r	74,207r	72,094r	89,157r	88,901	*-2.5*
Iron & steel	3,607	3,473	*-3.7*	904	880	911	912	882	862	882	847	844	*-4.3*
Other industries	95,211	100,323r	*+5.4*	24,432	22,566	22,645	25,568	25,952r	24,189r	23,220r	26,962r	27,404	*+5.6*
Transport	8,818	8,396	*-4.8*	2,190	2,203	2,203	2,223	2,216	1,884	2,147	2,149	1,885	*-14.9*
Domestic	118,153	118,900r	*+0.6*	36,268	25,227	23,798	32,860	36,154r	25,117r	23,176r	34,454r	34,418	*-4.8*
Other final users	96,411	95,561r	*-0.9*	25,979	23,073	23,678	23,682	25,992r	22,155r	22,669r	24,745r	24,350	*-6.3*
Non energy use	-	-		-	-	-	-	-	-	-	-	-	

1. Percentage change in the first quarter of 2011 compared with a year earlier.

2. Companies that produce electricity from nuclear sources plus all companies whose prime purpose is the generation of electricity are included under the heading "Major Power Producers". At the end of December 2009 they were:

AES Electric Ltd., Baglan Generation Ltd., Barking Power Ltd., British Energy plc., Centrica Energy, Coolkeeragh ESB Ltd., Corby Power Ltd., Coryton Energy Company Ltd., Derwent Cogeneration Ltd., Drax Power Ltd., EDF Energy plc., E.On UK plc., Energy Power Resources, Gaz De France, GDF Suez Teesside Power Ltd., Immingham CHP, International Power Mitsui, Magnox North Ltd., Premier Power Ltd., RGS Energy Ltd, Rocksavage Power Company Ltd., RWE Npower plc., Scottish Power plc., Scottish and Southern Energy plc., Seabank Power Ltd., SELCHP Ltd., Spalding Energy Company Ltd., Western Power Generation Ltd.

3. This table includes the change of definition of Major power producers (MPPs) to include major wind farm companies. Details of this change of definition were given in an article on pages 43 to 48 of the September 2008 edition of Energy Trends.

4. Gross supply from pumped storage hydro

5. Includes electricity used in generation and for pumping

List of special feature articles published in Energy Trends between June 2010 and March 2011

Energy

June 2010	Summary of 'Energy Efficiency Trends of IT appliances in Households' an ODYSSEE publication
September 2010	Estimates of heat use in the United Kingdom Running hours during winter 2009/10 for plants opted-out of the Large Combustion Plant Directive (LCPD) Potential changes to the methodology used to calculate domestic energy bills
December 2010	Sub-national estimates of non gas, non electricity and non road transport fuels for 2008 Sub-national total energy consumption statistics for 2008 New statistical release on home insulation levels
March 2011	Improvements to Energy Trends oil and gas tables Gas and electricity consumption data below Local Authority level Change over Time Analysis Viewer: Sub-national energy consumption European Energy Efficiency trends – Household energy consumption Estimates of domestic dual fuel energy bills in 2010

CO_2

March 2011	Carbon dioxide emissions and energy consumption in the UK

Combined Heat and Power (CHP)

September 2010	Combined Heat and Power in Scotland, Wales, Northern Ireland and the regions of England in 2009

Electricity

September 2010	Reporting electricity Feed in Tariff data in DECC's Energy Statistics Daily variations in electricity demand, and the effects of the 2010 Football World Cup
December 2010	Electricity generation and supply figures for Scotland, Wales, Northern Ireland and England, 2006 to 2009 Sub-national electricity consumption statistics for 2009 Sub-national domestic electricity consumption in Northern Ireland during 2008
March 2011	Sub-national non-domestic electricity consumption in Northern Ireland during 2009

Fuel Poverty

March 2011	Sub-regional fuel poverty data for England, 2008

Gas

December 2010	Sub-national gas consumption statistics for 2009 Physical gas flows across Europe in 2009

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June 2010	Regional and local use of road transport fuels in 2008
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Petroleum (oil and oil products) continued

March 2011	Diversity of supply for oil and oil products in OECD countries

Renewables

June 2010	Renewable energy in 2009
September 2010	Renewable electricity in Scotland, Wales, Northern Ireland and the regions of England in 2009
December 2010	Renewable energy: Statistics used for the EU 2020 renewables target New renewables table and amendments to electricity tables
March 2011	Renewable Electricity 2010 – provisional data Renewable energy supply around the world, 2008

UK Continental Shelf (UKCS)

March 2011	UKCS capital expenditure survey 2010

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(articles by issue) or
www.decc.gov.uk/en/content/cms/statistics/publications/trends/articles_sub/articles_sub.aspx
(articles by subject).

Explanatory notes

General

More detailed notes on the methodology used to compile the figures and data sources are included in the annual Digest of United Kingdom Energy Statistics

Symbols used in the tables

.. not available
- nil or less than half the final digit shown
p provisional
r revised; where a column or row shows 'r' at the beginning, most, but not necessarily all, of the data have been revised.
e estimated; totals of which the figures form a constituent part are therefore partly estimated

Notes to tables

- Figures for the latest periods and the corresponding averages (or totals) are provisional and are liable to subsequent revision.
- The figures have not been adjusted for temperature or seasonal factors except where noted.
- Due to rounding the sum of the constituent items may not equal the totals.
- Percentage changes relate to the corresponding period a year ago. They are calculated from unrounded figures but are shown only as (+) or (-) when the percentage change is very large.
- Quarterly figures relate to thirteen week periods except in the gas and petroleum sections where they relate to calendar quarters.
- All figures relate to the United Kingdom unless otherwise indicated.

Conversion factors

1 tonne of crude oil =	7.55 barrels
1 tonne =	1,000 kilograms
1 gallon (UK) =	4.54609 litres
1 kilowatt (kW) =	1,000 watts
1 megawatt (MW) =	1,000 kilowatts
1 gigawatt (GW) =	1,000 megawatts
1 terawatt (TW) =	1,000 gigawatts

All conversion of fuels from original units to units of energy is carried out on the basis of the gross calorific value of the fuel. More detailed information on conversion factors and calorific values is given in Annex A of the Digest of United Kingdom Energy Statistics.

Conversion matrices

To convert from the units on the left hand side to the units across the top multiply by the values in the table.

To:	**Thousand toe**	**Terajoules**	**GWh**	**Million therms**
From	**Multiply by**			
Thousand toe	1	41.868	11.630	0.39683
Terajoules (TJ)	0.023885	1	0.27778	0.0094778
Gigawatt hours (GWh)	0.085985	3.6000	1	0.034121
Million therms	2.5200	105.51	29.307	1

To:	**Tonnes of oil equivalent**	**Gigajoules**	**kWh**	**Therms**
From	**Multiply by**			
Tonnes of oil equivalent	1	41.868	11,630	396.83
Gigajoules (GJ)	0.023885	1	277.78	9.4778
Kilowatt hours (kWh)	0.000085985	0.003600	1	0.034121
Therms	0.0025200	0.105510	29.307	1

Note that all factors are quoted to 5 significant figures

Abbreviations

ATF	Aviation turbine fuel
CCGT	Combined cycle gas turbine
DERV	Diesel engined road vehicle
GVA	Gross value added
LNG	Liquefied natural gas
MSF	Manufactured solid fuels
NGLs	Natural gas liquids
UKCS	United Kingdom continental shelf

Sectoral breakdowns

The categories for final consumption by user are defined by the Standard Industrial Classification 2003, as follows:

Fuel producers	10-12, 23, 40
Final consumers	
Iron and steel	27, excluding 27.4, 27.53 and 27.54
Other industry	13-22, 24-37, 41 and 45 excluding those parts of 27 relating to Iron and Steel
Transport	60-63
Other final users	
Agriculture	1-2, 5
Commercial	50-52, 55, 64-67, 70-74
Public administration	75, 80, 85
Other services	90-93, 99
Domestic	Not covered by SIC 2003

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Energy Consumption in the UK

Available on the Internet at:
www.decc.gov.uk/en/content/cms/statistics/publications/ecuk/ecuk.aspx

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