dti

# UK ENERGY IN BRIEF JULY 2006

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## UK ENERGY IN BRIEF JULY 2006

This booklet summarises the latest statistics on energy production, consumption and prices in the United Kingdom. Figures are taken from the 2006 edition of the "Digest of UK Energy Statistics", published on 27 July 2006. Details of the Digest and other DTI energy publications can be found on pages 36 to 38 of this booklet and are available on the Internet (www.dti.gov.uk/energy/statistics/publications/index.html). This booklet is also available on the Internet at: http://www.dti.gov.uk/energy/statistics/publications/in-brief/page17222.html


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# INTRODUCTION TO THE CHARTS AND TABLES

The first four charts in this booklet are the four key indicators that are used to monitor progress in implementing the four goals for our energy policy set out in the 2003 Energy White Paper. The four goals are:

- To reduce $CO_2$ emissions by around 60% in 2050
- To maintain security of energy supplies
- To sustain industrial and business competitiveness
- To ensure that every home is adequately and affordably heated

These key indicators and 28 further supporting indicators are published in UK Energy Sector Indicators 2006, available in hardcopy from DTI Publications. Alternatively, the material is published along with a full set of background indicators on the DTI website at:

http://www.dti.gov.uk/energy/statistics/publications/indicators/page29741.html

**DTI Publications:**

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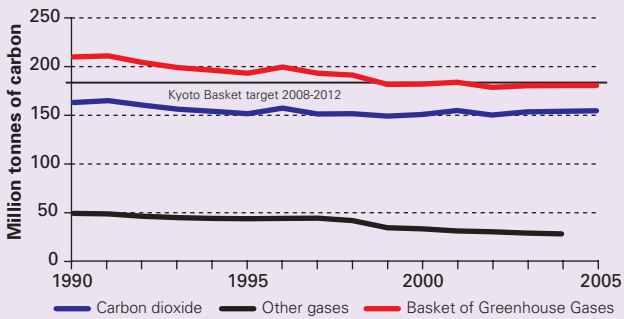
Email: publications@dti.gsi.gov.uk

The remainder of this booklet deals with separate sections of the energy industry; the economics of the energy industry, overall energy production and consumption and trends in production and consumption of the major fuel sources are covered. Also discussed are developments in Combined Heat and Power and renewable energy. Information is also given on energy prices, energy expenditure and energy efficiency.

The detailed background data can be found in the Digest of UK Energy Statistics 2006 available from The Stationery Office at £39.50 but is also available free of charge on the DTI energy website:
http://www.dti.gov.uk/energy/statistics/publications/dukes/page29812.html

**1. Low carbon – greenhouse gas and carbon dioxide emissions, 1990 to 2005**




Source: Department for Environment, Food and Rural Affairs

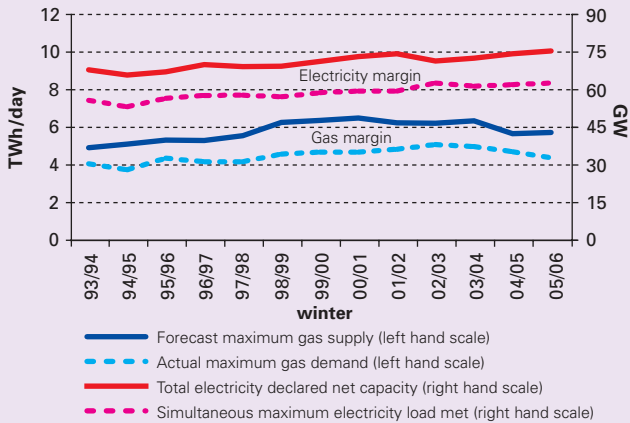
Million tonnes of carbon

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005(p) |
|---|---|---|---|---|---|---|
| Carbon dioxide | 161.5 | 149.9 | 149.0 | 151.8 | 152.5 | 153.0 |
| Methane | 25.1 | 21.8 | 16.3 | 12.9 | 12.5 | .. |
| Nitrous oxide | 18.6 | 15.5 | 12.1 | 10.9 | 11.1 | .. |
| HFC | 3.1 | 4.2 | 2.5 | 2.8 | 2.4 | .. |
| PFC | 0.4 | 0.1 | 0.1 | 0.1 | 0.1 | .. |
| SF6 | 0.3 | 0.3 | 0.5 | 0.4 | 0.3 | .. |
| **'Basket' of greenhouse gases** | **208.2** | **191.6** | **180.3** | **178.7** | **179.0** | **178.9** |

Source: Department for Environment, Food and Rural Affairs; DTI (2005 provisional figures)

Naturally occurring greenhouse gases maintain the earth's surface at a temperature 33°C warmer than it would be in their absence. At present greenhouse gas concentrations in the atmosphere are increasing as a result of human activities. Greenhouse gas emissions fell by 14.5% between 1990 and 2005, mainly due to a fall in carbon dioxide emissions. Carbon dioxide emissions contribute about 70% of the potential global warming effect of anthropogenic emissions of greenhouse gases and are created when fossil fuels are burned. Emissions of carbon dioxide fell by 5.6% between 1990 and 2004. Estimates based on energy production and consumption in 2005 indicate that emissions rose by 0.3% during 2005, thus the total change from 1990 is a fall of 5.3%.

**2. Reliability – gas and electricity capacity margins – maximum supply and maximum demand 1993/4 to 2005/6**



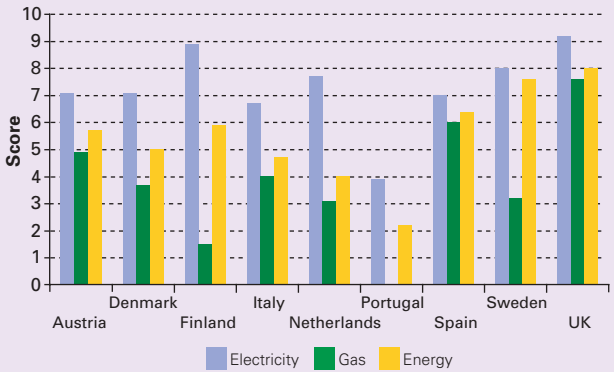

Source: National Grid and DTI

Target is to ensure that the market provides sufficient capacity to meet maximum gas and electricity demand in each year.

In response to higher electricity prices, more previously mothballed capacity was back in service for winter 2005/06 and one new plant began to operate in Northern Ireland. In Great Britain, the plant margin rose from around 20% in 2004/05 to 22% for the winter period in 2005/06.

For gas, while the maximum gas supply was slightly higher than in 2004/05, high gas prices encouraged generators and some other large users to cut back on consumption.

**3. Competitiveness – overall competitiveness score for selected EU energy markets (using preliminary 2004 data)**

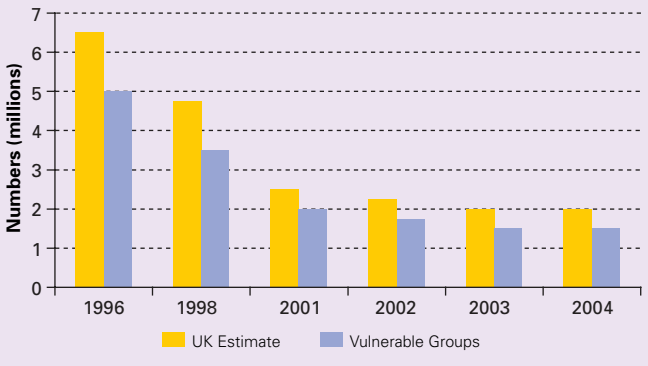



Source: Study undertaken by OXERA on behalf of DTI

The competitiveness of energy markets is measured using a methodology developed by OXERA on behalf of DTI based on indicators of energy market liberalisation at each stage of the supply chain (upstream, wholesale markets, network and retail) and applied to energy markets in the EU and G7. A report sets out the methodology in more detail, and can be found at:
www.dti.gov.uk/energy/markets/competitiveness/page28432.html

In 2004, the UK ranks the highest out of all the EU and G7 countries in both electricity and gas markets, and therefore also has the most competitive energy market overall, as it has done in each of the three previous years.

## 4. Fuel poverty – number of UK households in fuel poverty[1]




Source: Various[2]

| Numbers in Fuel Poverty in England[3] | Total number of households (millions) | | | | | | Number of vulnerable households (millions)[4] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1996 | 1998 | 2001 | 2002 | 2003 | 2004 | 1996 | 1998 | 2001 | 2002 | 2003 | 2004 |
| Including HB/ISMI | 5.1 | 3.4[5] | 1.7 | 1.4[5] | 1.2 | 1.2 | 4.0 | 2.8[5] | 1.4 | 1.2[5] | 1.0 | 1.0 |
| Excluding HB/ISMI | 5.5 | 4.0[5] | 2.3 | 2.0[5] | 1.5 | 1.4 | 4.3 | 3.2[5] | 1.9 | 1.6[5] | 1.2 | 1.1 |

(1) The chart above shows the incidence of fuel poverty in the UK when Housing Benefit and Interest for Mortgage relief payments (HB/ISMI) are included as household income. Previous figures have been revised as a result of methodological improvements.

(2) Sources: English House Condition Survey, Scottish House Condition Survey, Welsh House Condition Survey, Northern Ireland Interim House Condition Survey.

(3) The table shows the incidence of fuel poverty on the two commonly used definitions of fuel poverty, when HB/ISMI are included as income and when they are excluded from income.

(4) Vulnerable households are households that contain children, elderly people, or those with disabilities or long-term illness.

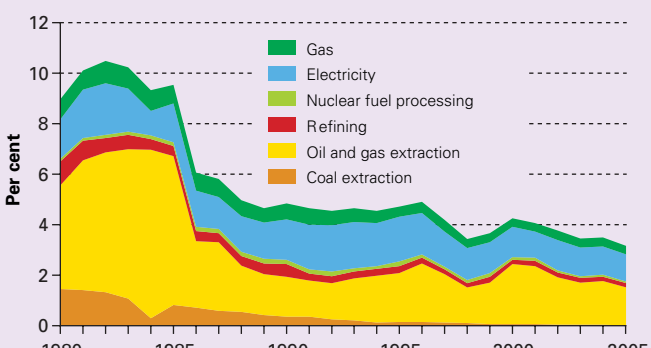
(5) Based on estimated modelled data

The number of households in fuel poverty has been reducing since 1996, as has the number of vulnerable fuel poor. In broad terms it is estimated that the number of fuel poor households in the UK has fallen from about 6½ million in 1996 to about 2 million in 2004. The number of vulnerable fuel poor is estimated to have fallen from about 5 million to about 1½ million in the same period.

**THE ENERGY INDUSTRIES' CONTRIBUTION TO THE UK ECONOMY**

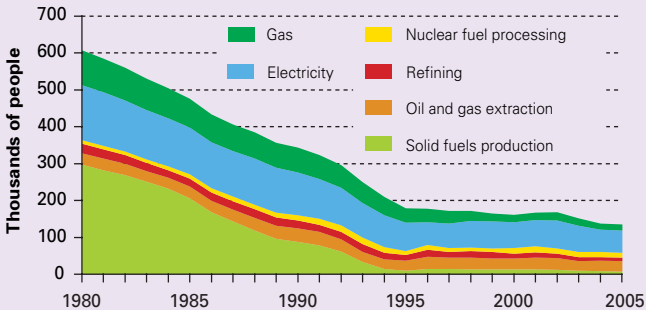
- 3.2% of GDP
- 5.8% of total investment
- 32.6% of industrial investment
- 3% of annual business expenditure on research and development
- 135,900 people directly employed in 2005 (4% of industrial employment) and more indirectly eg an estimated 260,000 in support of UK Continental Shelf production

**Contribution to GDP by the energy industries, 1980 to 2005**



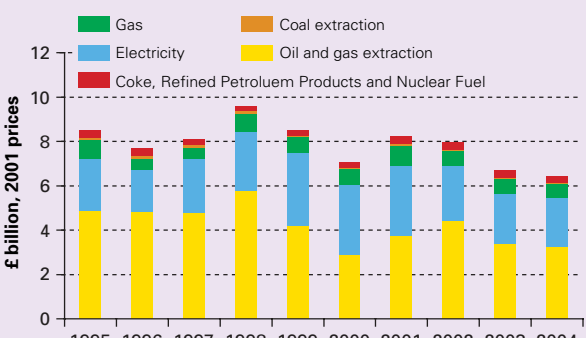

*Source: Office for National Statistics*

## Trends in employment in the energy industries, 1980 to 2005



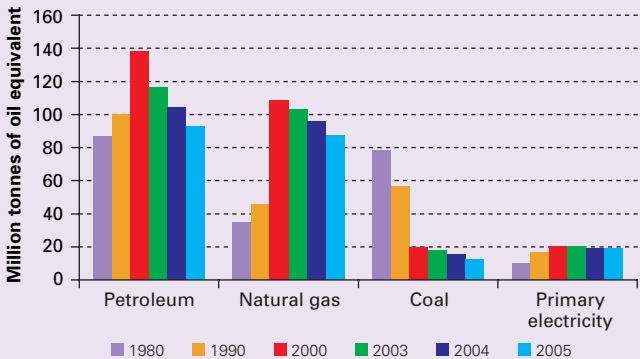

*Source: Office for National Statistics*

## Investment in the energy industries, 1995 to 2004




*Source: Office for National Statistics*

**Production of primary fuels, 1980 to 2005**



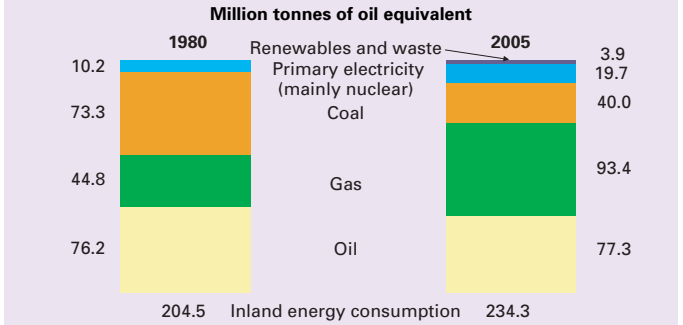

Million tonnes of oil equivalent

| | 1980 | 1990 | 2000 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|
| Petroleum | 86.9 | 100.1 | 138.3 | 116.2 | 104.5 | 92.9 |
| Natural gas | 34.8 | 45.5 | 108.4 | 102.9 | 96.0 | 87.6 |
| Coal | 78.5 | 56.4 | 19.6 | 17.6 | 15.6 | 12.7 |
| Primary electricity | 110.2 | 16.7 | 20.2 | 20.4 | 18.8 | 19.0 |
| **Total** | **210.5** | **219.4** | **288.7** | **260.3** | **238.1** | **215.4** |

Total production of primary fuels, when expressed in terms of their energy content, fell by 9.5% in 2005 compared to 2004. Petroleum accounts for 43% of total production, natural gas 41%, coal 6% and primary electricity (nuclear and natural flow hydro) 9%. Renewables and waste (not shown) account for the remaining 3.2 million tonnes of oil equivalent.

Total production increased rapidly between 1980 and 2000, primarily due to the growth of oil and gas. Since 2000 production has started to decline and is now only 2.4% higher than in 1980. Production in 2000 was at record levels for natural gas, whilst in 1999 it was at record levels for overall energy and petroleum.

## Inland energy consumption, 1980 to 2005




Million tonnes of oil equivalent

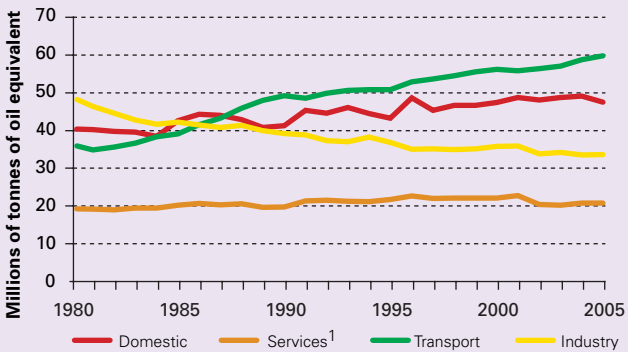
| | 1980 | 1990 | 2000 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|
| Conversion losses | 62.1 | 66.4 | 53.8 | 53.6 | 53.3 | 54.4 |
| Distribution losses and energy industry use | | | 20.7 | 20.1 | 20.0 | 20.3 |
| Final consumption | | | | | | |
| Industry | 48.3 | 38.7 | 35.2 | 33.7 | 33.0 | 33.1 |
| Domestic sector | 39.8 | 40.8 | 46.9 | 48.2 | 48.6 | 47.0 |
| Transport | 35.5 | 48.6 | 55.6 | 56.5 | 58.2 | 59.2 |
| Services[1] | 18.7 | 19.2 | 21.5 | 19.7 | 20.2 | 20.2 |
| **Total final energy consumption** | **142.4** | **147.3** | **159.2** | **158.0** | **159.9** | **159.5** |
| **Total inland primary energy consumption[2]** | **204.5** | **213.6** | **233.7** | **232.0** | **233.4** | **234.3** |
| *Temperature corrected total* | *206.2* | *221.6* | *237.9* | *236.1* | *238.9* | *237.6* |

(1) Includes agriculture

(2) Excludes non-energy use

Primary energy consumption was 0.4% higher in 2005 than 2004. Since 1980 consumption of natural gas and primary electricity has risen considerably, whilst consumption of oil has remained around the same and coal has fallen. Energy industry use, losses during conversion to secondary fuels and losses during distribution accounted for 32% of inland energy consumption in 2005.

## Final energy consumption, 1980 to 2005




**2005** **Million tonnes of oil equivalent**

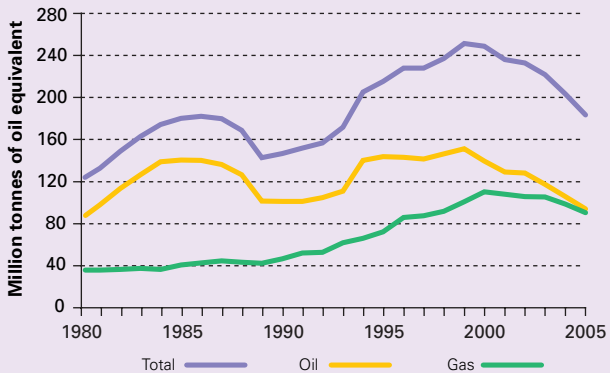
| | Industry | Domestic | Transport | Services[1] | Total |
|---|---|---|---|---|---|
| Coal & manufactured fuels | 2.0 | 0.7 | - | - | 2.7 |
| Gas | 12.8 | 32.8 | - | 9.2 | 54.8 |
| Oil | 7.1 | 3.1 | 58.5 | 1.8 | 70.4 |
| Electricity | 10.2 | 10.0 | 0.7 | 8.7 | 29.7 |
| Renewables and heat | 1.0 | 0.3 | - | 0.6 | 1.9 |
| **Total** | **33.1** | **47.0** | **59.2** | **20.0** | **159.5** |

(1) Includes agriculture

Final energy consumption (excluding non-energy use) was 0.2% lower in 2005 than in 2004. Since 1980 energy consumption by individual sectors has changed substantially: there have been rises of 67% for transport, 18% for the domestic sector and 8% for the service sector, whilst consumption by industry has fallen by 31%.

# OIL AND GAS PRODUCTION

## UK Continental Shelf production, 1980 to 2005



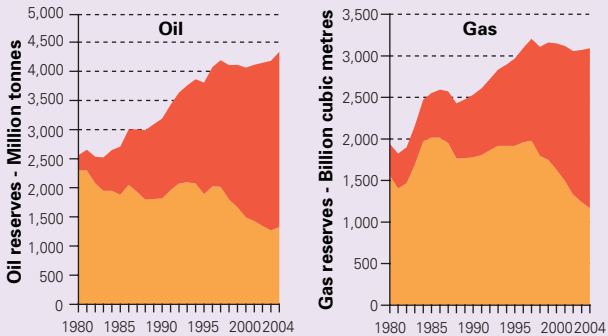

Million tonnes of oil equivalent

| | 1980 | 1990 | 2000 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|
| Oil | 86.9 | 100.1 | 138.3 | 116.3 | 104.6 | 92.8 |
| Gas | 34.8 | 45.5 | 109.3 | 104.2 | 97.5 | 89.3 |
| **Total** | **121.7** | **145.6** | **247.6** | **220.5** | **202.1** | **182.1** |

Oil production in 2005 was 38% lower than the record level seen in 1999 and 11% lower than in 2004. Six new fields started production in 2005, but production from these fields was insufficient to make up the general decline in production from older established fields. Gas production in 2005 was 9% lower than in 2004. And 18% lower than the record level seen in 2000. As with oil, UK gas production is also declining as UK Continental Shelf reserves deplete.

# OIL AND GAS PRODUCTION

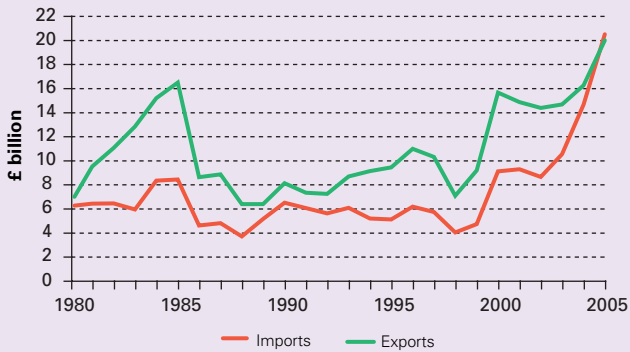
## Remaining oil and gas reserves




| | 1980 | 1990 | 2000 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|
| **Oil** | | | | | | **Million tonnes** |
| Cumulative production | 263 | 1,374 | 2,570 | 2,799 | 2,910 | 3,005 |
| Estimate of remaining reserves in present discoveries | 2,300 | 1,815 | 1,490 | 1,345 | 1,267 | 1,328 |
| **Total reserves in present discoveries** | **2,565** | **3,190** | **4,060** | **4,145** | **4,175** | **4,333** |
| **Gas** | | | | | | **Billion cubic metres** |
| Cumulative production | 382 | 752 | 1,518 | 1,726 | 1,828 | 1,921 |
| Estimate of remaining reserves in present discoveries | 1,560 | 1,785 | 1,630 | 1,330 | 1,241 | 1,169 |
| **Total reserves in present discoveries** | **1,940** | **2,535** | **3,150** | **3,055** | **3,070** | **3,090** |

In earlier years estimates of remaining reserves in present discoveries stayed at broadly similar levels despite the large increase in oil and gas extracted. This was due to newfound discoveries, new technology allowing exploitation of discoveries being made and new technology allowing exploitation of discoveries that were previously regarded as not viable.

## Foreign trade in crude oil and petroleum products, 1980 to 2005



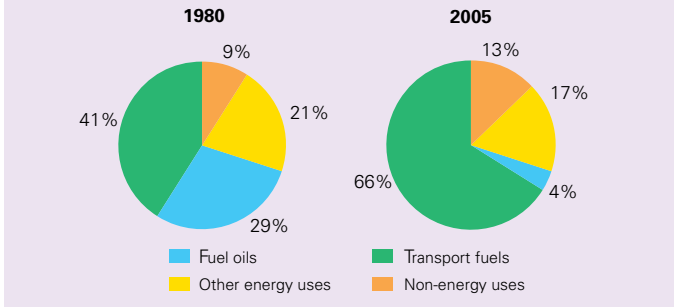

**Crude oil and petroleum products** **£ billion**

| | 1980 | 1990 | 2000 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|
| Exports | 6.5 | 8.1 | 15.6 | 14.6 | 16.2 | 19.9 |
| Imports | 6.2 | 6.4 | 9.0 | 10.5 | 14.6 | 20.4 |
| **Net exports** | **0.3** | **1.6** | **6.5** | **4.1** | **1.6** | **-0.5** |

Source: Office for National Statistics

Since the first 'surplus' on oil trade (£0.3 billion) in 1980, oil trade has contributed £98 billion to the UK balance of payments. The largest 'surplus' (£8 billion) in 1985 reflected high crude oil production and prices. In 1990 the 'surplus' fell from this peak due to lower prices but managed to peak again in 2000 (£6.5 billion). Since 2000 the surplus has steadily declined and in 2005 the UK became a net importer of oil (-£0.5 billion).

## Demand by product, 1980 to 2005




Million tonnes

| | 1980 | 1990 | 2000 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|
| **Energy uses**[1] | | | | | | |
| Petrol | 19.2 | 24.3 | 21.4 | 19.9 | 19.5 | 18.7 |
| DERV fuel | 5.9 | 10.7 | 15.6 | 17.7 | 18.5 | 19.4 |
| Aviation turbine fuel | 4.7 | 6.6 | 10.8 | 10.8 | 11.8 | 12.5 |
| Burning oil | 2.1 | 2.1 | 3.8 | 3.6 | 4.0 | 3.9 |
| Gas oil | 11.6 | 8.0 | 6.8 | 6.2 | 6.0 | 6.8 |
| Fuel oil | 22.7 | 14.0 | 3.3 | 3.6 | 3.7 | 3.5 |
| Other | 4.3 | 4.9 | 5.3 | 5.0 | 5.2 | 5.5 |
| **Total energy uses** | **70.5** | **70.6** | **67.1** | **66.7** | **68.7** | **70.3** |
| Of which: | | | | | | |
| Transport fuels | 31.9 | 43.5 | 49.6 | 50.4 | 52.0 | 52.9 |
| **Non-energy uses** | **7.0** | **9.2** | **10.1** | **10.4** | **10.6** | **10.7** |
| **Total deliveries** | **77.5** | **79.8** | **77.2** | **77.2** | **79.3** | **81.0** |

(1) Energy uses includes uses for transformation (eg electricity generation) and energy industry own use (eg refinery fuels)

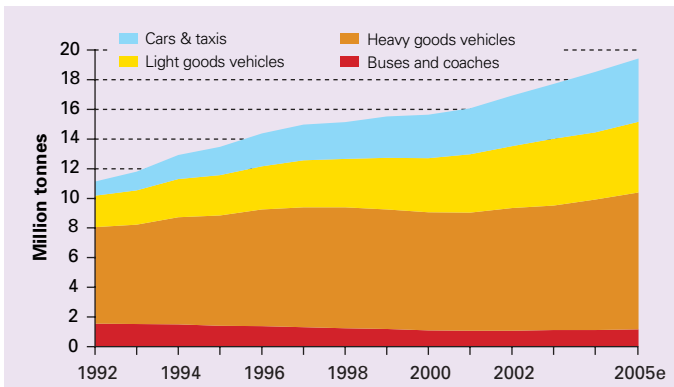
In 2005 transport fuels increased their share of overall oil demand with increases in consumption for air and road transport. Deliveries of motor spirit decreased but were offset by an increase in DERV fuel. The move to natural gas by electricity generators and industry as the preferred energy source explains the fall in demand for fuel oil. However, compared with 2003, oil products used for electricity generation in 2005 bucked this downward trend and increased which was probably due to high gas prices. There has been a small increase in non-energy use since 2000.

## Demand for road fuels, 1990 to 2005

**Petrol Demand** — **Thousand tonnes**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|
| Total | 24,310 | 21,950 | 21,403 | 19,918 | 19,484 | 18,731 |

**DERV fuel**



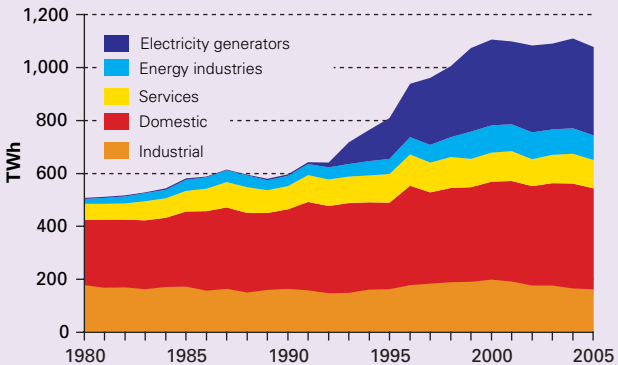

**DERV fuel demand** — **Thousand tonnes**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|
| Cars & taxis | 917 | 1,909 | 2,921 | 3,688 | 4,063 | 4,265 estimated |
| Light goods vehicles | 1,653 | 2,703 | 3,650 | 4,511 | 4,543 | 4,770 estimated |
| Heavy goods vehicles | 7,034 | 7,437 | 7,971 | 8,393 | 8,787 | 9,224 estimated |
| Buses & coaches | 1,048 | 1,411 | 1,090 | 1,120 | 1,121 | 1,177 estimated |
| **Total** | **10,652** | **13,457** | **15,632** | **17,712** | **18,514** | **19,436** |

UK motor spirit consumption peaked in 1990 and has gradually declined ever since. In 2005, DERV deliveries were higher than motor spirit deliveries for the first time in weight terms.

The breakdown in use of DERV fuel given above is based upon modelled fuel consumption produced by NETCEN when deriving the UK emissions inventory. Figures for 2005 have been estimated using the 2004 ratios. Since 1990, demand for DERV fuel has increased largely for use in cars supplanting petrol (see p18).

## Natural gas consumption, 1980 to 2005

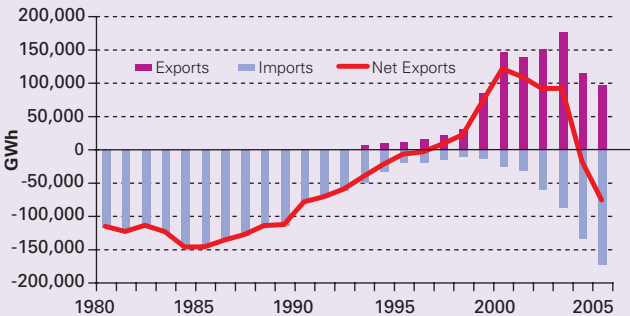



TWh

| | 1980 | 1990 | 2000 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|
| Electricity generators | 4.0 | 6.5 | 324.6 | 323.9 | 340.5 | 333.2 |
| Energy Industries | 19.1 | 39.2 | 102.1 | 96.1 | 96.1 | 93.3 |
| Industry | 177.5 | 164.6 | 198.5 | 176.7 | 165.4 | 159.3 |
| Domestic | 246.8 | 300.4 | 369.9 | 386.5 | 396.4 | 381.9 |
| Services | 60.4 | 86.4 | 110.5 | 106.7 | 112.1 | 106.7 |
| **Total** | **507.8** | **597.0** | **1,105.5** | **1,090.0** | **1,109.6** | **1,074.5** |

In the early 1970s, following the advent of natural gas, gas consumption grew rapidly. Industrial consumption peaked in 2000 and has fallen since then by around 20%. Over the last 20 years domestic consumption has grown by 35% and services consumption by 37%. However, since 1991 the growth in gas consumption has been dominated by its increasing use in electricity generation, which now accounts for 31% of all natural gas consumption.

## UK trade in natural gas, 1980 to 2005

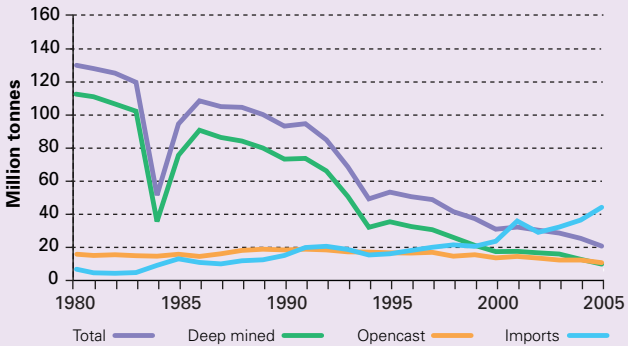



GWh

| | 1980 | 1990 | 2001 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|
| Natural gas production | 404,800 | 528,843 | 1,231,263 | 1,196,115 | 1,116,744 | 1,017,813 |
| Imports | 116,291 | 79,833 | 30,464 | 86,298 | 133,035 | 173,328 |
| Exports | - | - | 138,330 | 177,039 | 114,111 | 96,181 |
| Net imports (-) or exports (+) | -116,291 | -79,833 | 107,866 | 90,741 | -18,924 | -77,147 |

The UK began exporting natural gas in 1993 but did not become a net exporter of gas until 1997. Exports grew rapidly with the opening of the Bacton-Zeebrugge interconnector in 1998 to peak in 2003 although net exports peaked earlier in 2000. Declining UK indigenous production allied to increasing demand led to the UK becoming a net importer of gas once more in 2004. This trend continued in 2005 with exports falling by 16 per cent compared to 2004 and imports increasing by 30 per cent.

## Coal production and imports, 1980 to 2005

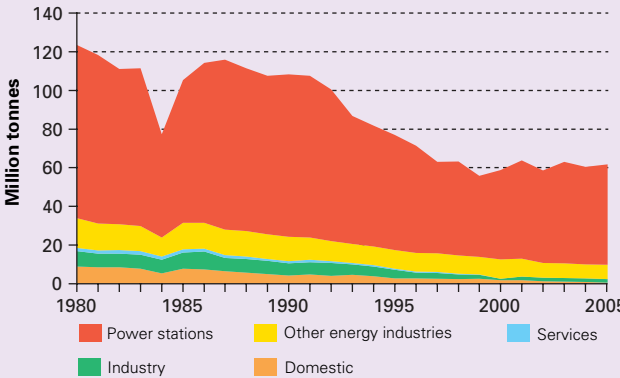



Million tonnes

| | 1980 | 1990 | 2000 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|
| Deep mined | 112.4 | 72.9 | 17.2 | 15.6 | 12.5 | 9.6 |
| Opencast | 15.8 | 18.1 | 13.4 | 12.1 | 12.0 | 10.4 |
| **Total (including slurry)** | **130.1** | **92.8** | **31.2** | **28.3** | **25.1** | **20.5** |
| Coal imports | 7.3 | 14.8 | 23.4 | 31.9 | 36.2 | 44.0 |

Coal production was 18% lower in 2005 than in 2004; deep mined production fell by 24%, while opencast production fell by 13%. Geological and operational difficulties in deep mines meant that for the first time ever, more coal was mined by opencast methods in 2005. Imports, initially of coal types in short supply in this country, started in 1970 and then grew steadily to reach the 20 million tonnes a year mark by the late 1990s. The very rapid expansion of imports in 2001 meant that imports exceeded the level of UK production for the first time. There was a dip in import volumes in 2002. However, since then imports have been rising to make up the shortfall in production and in 2005 they reached a record 44 million tonnes.

## Coal consumption, 1980 to 2005

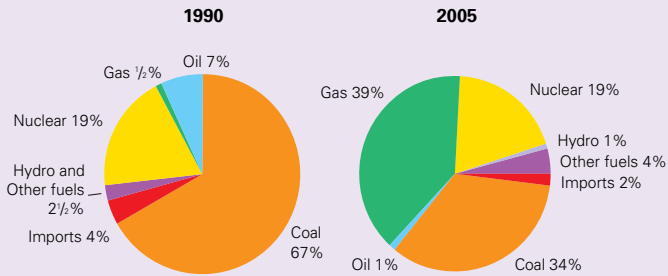



Million tonnes

| | 1980 | 1990 | 2000 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|
| Power stations | 89.6 | 84.0 | 46.2 | 52.5 | 50.4 | 52.1 |
| Domestic | 8.9 | 4.2 | 1.9 | 1.0 | 0.9 | 0.6 |
| Industry | 7.9 | 6.3 | 0.7 | 1.9 | 1.8 | 1.8 |
| Services | 1.8 | 1.2 | 0.1 | <0.1 | <0.1 | <0.1 |
| Other energy industries | 15.3 | 12.5 | 10.0 | 7.6 | 7.2 | 7.3 |
| **Total consumption** | **123.5** | **108.3** | **58.9** | **63.0** | **60.4** | **61.8** |

The proportion of coal consumed by power stations has increased steadily since the 1970s, reaching a level of around 84% in 2003. The decline in coal consumption at power stations has halted in recent years and has stabilised at around 50 to 52 million tonnes. Coal consumption as a whole declined sharply during the 1990s, at an average annual rate of 7% compared with just a 2% annual decline over the previous 20 years. In the last 5 years, coal consumption has remained around the 60 million tonnes mark.

## Electricity supplied by fuel type, 1980 to 2005

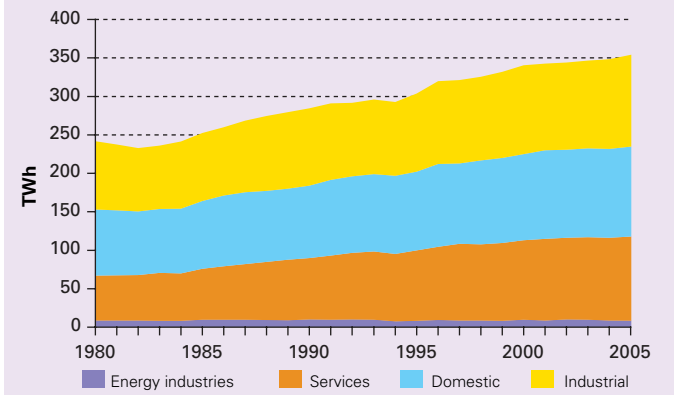



TWh

| | 1980 | 1990 | 2000 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|
| Coal | 190.0 | 208.0 | 114.7 | 131.7 | 125.7 | 130.0 |
| Oil | 33.9 | 21.1 | 5.9 | 4.1 | 4.3 | 4.7 |
| Gas | 1.6 | 1.6 | 145.0 | 145.1 | 154.0 | 149.8 |
| Nuclear | 32.3 | 58.7 | 78.3 | 81.9 | 73.6 | 75.2 |
| Hydro | 7.3 | 7.9 | 4.2 | 2.3 | 4.0 | 4.0 |
| Other fuels | - | - | 9.2 | 11.2 | 13.0 | 15.3 |
| Net Imports | - | 11.9 | 14.2 | 2.2 | 7.5 | 8.3 |
| **Total electricity available** | **265.1** | **309.4** | **371.5** | **378.7** | **382.1** | **387.3** |

The mix of fuels used to generate electricity continues to evolve. Since 1990, the use of coal, oil, and hydro in electricity generation has fallen, while renewables other than hydro have risen. The use of nuclear rose but has since fallen back. Gas has risen most markedly over this period from 1.6 to 150 TWh. Net import levels averaged over 16 TWh in the mid 1990s but are now only half that level. Since 2000 coal has been called upon to make up for reduced availability of nuclear stations and as a substitute for high priced gas. However, gas continues to retain the largest share of the market (39%) while coal's share of the market has fallen from two thirds in 1980 to a third in 2005. Nuclear's share peaked at 26% in 1997 but in 2005 it was only 19%.

## Electricity consumption, 1980 to 2005



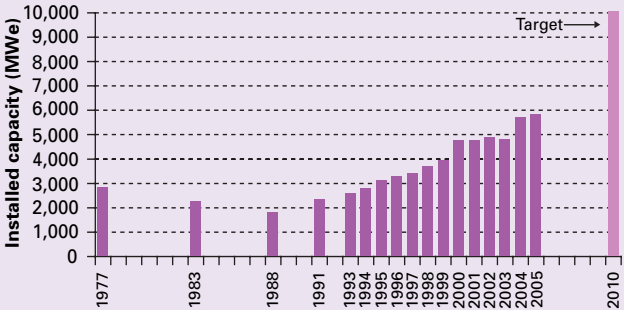

TWh

| | 1980 | 1990 | 2000 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|
| Industrial | 88.6 | 100.6 | 115.3 | 114.0 | 116.5 | 119.5 |
| Domestic | 86.1 | 93.8 | 111.8 | 115.8 | 115.5 | 116.8 |
| Services | 58.4 | 80.0 | 103.5 | 107.1 | 107.6 | 109.6 |
| Energy industries | 8.5 | 10.0 | 9.7 | 9.8 | 8.5 | 9.2 |
| **Total** | **241.6** | **284.4** | **340.3** | **344.1** | **348.0** | **350.4** |

Over the last 5 years electricity consumption in the domestic and services sectors has grown by 4% and 6% respectively. Industrial consumption varies with business activity: it rose every year between 1994 and 2000, fell back by 2½% in 2001 but subsequent growth meant that by 2004 it had exceeded the 2000 level and continued to grow in 2005.

# COMBINED HEAT AND POWER

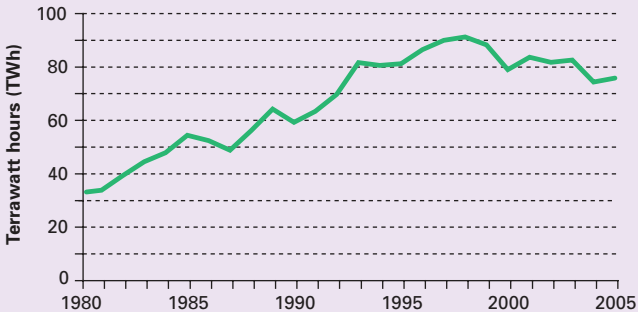
**Combined heat and power, 1977 to 2005**




| | 1995 | 2000 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|
| CHP electrical capacity (MWe) | 3,094 | 4,730 | 4,777 | 5,684 | 5,792 |
| CHP electrical generation (GWh) | 14,468 | 26,539 | 24,916 | 28,065 | 30,340 |
| CHP heat generation (GWh) | 57,401 | 62,121 | 60,052 | 62,140 | 63,124 |
| Number of CHP sites | | | | | |
| Less than 100 kWe | 686 | 667 | 622 | 592 | 581 |
| 100 kWe to 999 kWe | 411 | 593 | 648 | 667 | 682 |
| 1 MWe to 9.9 MWe | 147 | 192 | 190 | 195 | 196 |
| 10 MWe and greater | 64 | 70 | 74 | 73 | 75 |
| **Total** | **1,308** | **1,522** | **1,534** | **1,527** | **1,534** |

Electrical capacity increased by 2% in 2005 but generation of electricity rose by 8%. Thirty seven per cent of the CHP installations in the UK are small schemes with an electrical capacity of less than 100 kWe, however schemes larger than 10 MWe account for over 83% of the total CHP installed electrical capacity. In 2005, 7½% of the total electricity generated in the UK came from CHP plants. The Government has a target of reaching at least 10,000 MWe of CHP electrical capacity by 2010, as part of its Climate Change Programme.

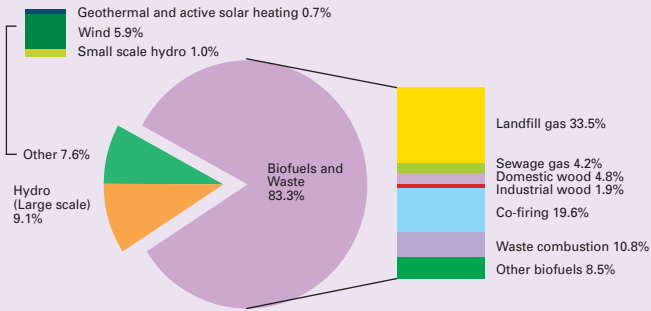
**Gross electricity supplied by nuclear generation, 1980 to 2005**




| | 1990 | 2000 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|
| Electricity supplied (gross) (TWh) | 59 | 78 | 82 | 74 | 75 |
| % of electricity generation | 21 | 22 | 22 | 19 | 19 |

During 2005 nuclear generators increased their output from the low levels of 2004 caused by unplanned outages due to emergency maintenance and safety concerns and electricity output was up by 2%. It represented just under a fifth of the total volume of electricity generated in the UK in 2005. Nuclear electricity output was over 25% higher in 2005 than in 1990.

## Renewable energy sources, 2005




Total renewables used= 4.25million tonnes of oil equivalent

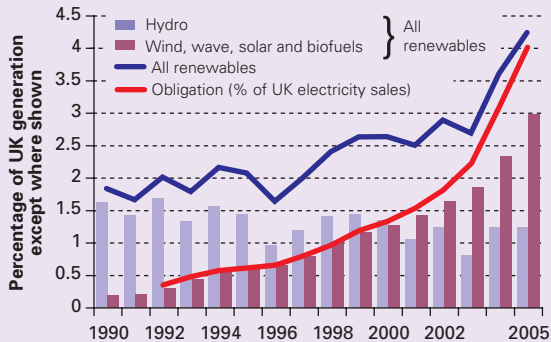
**Total use of renewables** — **Thousand tonnes of oil equivalent**

| | 1990 | 2000 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|
| Geothermal and active solar heating | 7.2 | 12.0 | 20.8 | 24.9 | 30.1 |
| Wind and wave | 0.8 | 81.3 | 110.5 | 166.4 | 250.1 |
| Hydro (small and large-scale) | 447.7 | 437.3 | 277.5 | 423.9 | 426.6 |
| Landfill gas | 79.8 | 731.1 | 1,088.1 | 1,326.7 | 1,420.8 |
| Sewage gas | 138.2 | 168.7 | 165.0 | 176.7 | 179.1 |
| Wood (domestic and industrial) | 174.1 | 502.8 | 399.8 | 399.8 | 285.1 |
| Waste combustion | 100.8 | 375.6 | 479.5 | 463.1 | 460.0 |
| Other biofuels | 71.9 | 216.1 | 573.8 | 710.1 | 1,193.1 |
| **Total** | **1,020.5** | **2,524.9** | **3,115.2** | **3,692.4** | **4,245.5** |

In 2005, biofuels accounted for 83% of renewable energy sources used with most of the remainder coming from large-scale hydro, wind and other electricity production. Hydro accounted for 9% and wind power contributed 6%.

Of the 4.25 million tonnes of oil equivalent of primary energy use accounted for by renewables, 3.77 million tonnes was used to generate electricity and 0.48 million tonnes to generate heat. Renewable energy use grew by 15% in 2005 and is now four times the level it was at in 1990.

## Growth in electricity generation from renewable sources since 1990

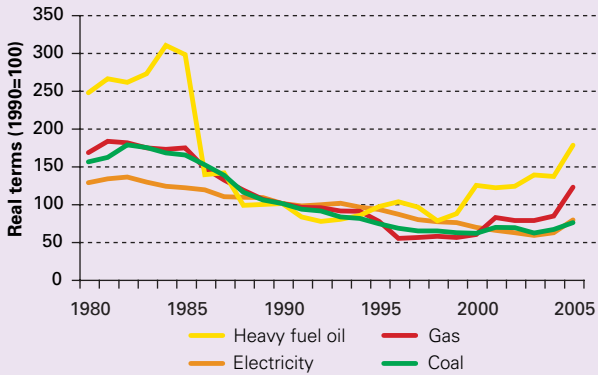



| | Percentage of UK generation except where shown | | | | |
|---|---|---|---|---|---|
| | **1990** | **2000** | **2003** | **2004** | **2005** |
| Wind, wave, solar and biofuels | 0.19 | 1.27 | 1.86 | 2.33 | 2.98 |
| Hydro | 1.63 | 1.35 | 0.81 | 1.25 | 1.24 |
| **Total Renewables** | **1.82** | **2.62** | **2.67** | **3.58** | **4.22** |
| Obligation (% of UK electricity sales) | - | 1.32 | 2.21 | 3.09 | 4.00 |

Renewables accounted for 4.2% of electricity generated in the UK in 2005, up from 3.6% in 2004. Hydro recovered from unusually low levels in 2003, which were caused by decreased water flow from low rainfall.

Renewables accounted for 4.0% of UK electricity sales on a Renewables Obligation basis, up from 3.1% in 2004.

## Fuel price indices for the industrial sector, 1980 to 2005



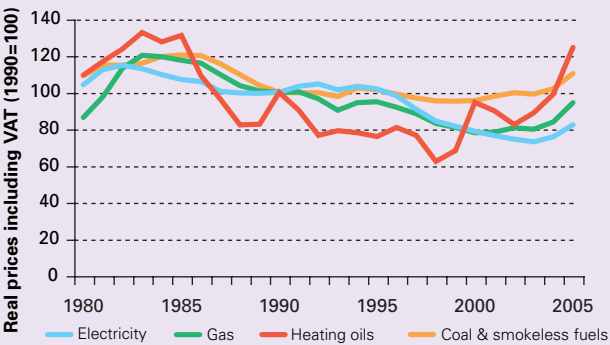

Real prices, 1990 = 100

| | 1980 | 1990 | 2000 | 2002[1] | 2003[1] | 2004[1] | 2005[1] |
|---|---|---|---|---|---|---|---|
| Electricity | 127.5 | 100 | 68.4 | 61.5 | 57.8 | 61.5 | 78.3 |
| Gas | 167.4 | 100 | 59.2 | 77.4 | 77.6 | 83.4 | 121.6 |
| Heavy fuel oil | 246.3 | 100 | 123.8 | 122.8 | 137.8 | 135.7 | 177.0 |
| Coal | 155.0 | 100 | 60.7 | 68.0 | 61.2 | 65.8 | 74.7 |
| **Industrial prices** | **175.1** | **100** | **77.5** | **77.4** | **82.4** | **85.1** | **113.0** |

(1) Includes the Climate Change Levy that came into effect in April 2001.

Industrial electricity prices increased in 2005 by 27% in real terms, but were 15% lower than 10 years earlier in 1995. Despite the increase in 2005, average industrial electricity prices are still lower in real terms over the whole period 1970 to 1995. Gas prices increased by 46% in 2005, and were 59% higher than in 1995. Heavy fuel oil prices increased by 30% in the year to 2005, and were 84% higher than in 1995.

## Fuel price indices for the domestic sector, 1980 to 2005



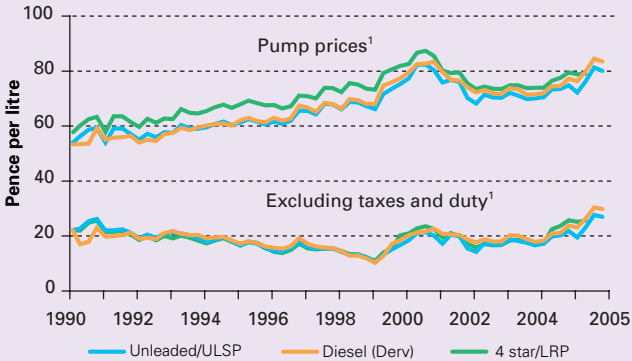

Real prices including VAT, 1990 = 100

| | 1980 | 1990 | 2000 | 2002 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|---|
| Coal and smokeless fuels | 109.1 | 100.0 | 95.6 | 99.9 | 99.1 | 102.0 | 110.3 |
| Gas | 86.2 | 100.0 | 77.9 | 80.7 | 79.9 | 83.9 | 94.4 |
| Electricity | 104.1 | 100.0 | 78.8 | 74.4 | 73.1 | 75.8 | 82.3 |
| Heating oils | 109.5 | 100.0 | 94.6 | 82.4 | 88.8 | 99.0 | 124.5 |
| **Domestic prices (fuel & light)** | **98.8** | **100.0** | **79.8** | **78.6** | **78.0** | **81.7** | **91.0** |

Source: Retail Price Index, Office for National Statistics

Total domestic energy prices in 2005 increased in real terms by 11%. Within the overall movement, electricity prices increased by 9%, gas increased by 13% and the price of coal and smokeless fuels increased by 8%. The largest increase over the period was for heating oils with an increase of 26%. Over the last ten years, between 1995 and 2005, real prices have fallen by 19% and 1% respectively for electricity and gas, whilst the real price of heating oils has increased by 64% and the real price of coal and smokeless fuels has increased by 9%.

## Petrol and diesel prices, 1990 to 2005




(1) Deflated using GDP(mp) deflator 2000 prices.

**Current retail prices** **Pence/litre**

| | 4 star/LRP | Unleaded | Diesel |
|---|---|---|---|
| 1980 | 28.32 | .. | 29.67 |
| 1985 | 43.14 | .. | 41.94 |
| 1990 | 44.87 | 42.03 | 40.48 |
| 1995 | 59.70 | 53.77 | 54.24 |
| 2000 | 84.89 | 79.93 | 81.34 |
| 2001 | 79.71 | 75.72 | 77.84 |
| 2002 | 77.03 | 73.24 | 75.46 |
| 2003 | 79.94 | 76.04 | 77.92 |
| 2004 | 84.42 | 80.22 | 81.91 |
| 2005 | * | 86.75 | 90.86 |

*The LRP Series has been discontinued from September 2005 due to the low volume of sales.

The real terms price of Ultra Low Sulphur Petrol increased by 6% during 2004/05, whilst the price of diesel increased by 9%. In cash terms, a litre of ULSP cost 6.5 pence more in 2005 than a year earlier, whilst diesel increased by 9 pence per litre.

## Fuel expenditure of households[1], 2004/05

| | Income decile | | | | | |
|---|---|---|---|---|---|---|
| **Expenditure (£ per week)** | **Lowest** | **Third** | **Fifth** | **Eighth** | **Highest** | **All households** |
| Gas | 3.4 | 4.6 | 5.5 | 6.5 | 8.0 | 5.5 |
| Electricity | 4.2 | 5.1 | 5.9 | 6.9 | 8.2 | 6.0 |
| Other Fuels | 0.6 | 0.8 | 0.8 | 1.1 | 2.0 | 1.0 |
| Total fuel expenditure | 8.2 | 10.5 | 12.2 | 14.5 | 18.2 | 12.5 |
| **Total expenditure** | **147.3** | **248.7** | **373.3** | **568.3** | **925.7** | **434.4** |
| **Percentage of total expenditure** | | | | | | |
| Gas | 2.3 | 1.8 | 1.5 | 1.1 | 0.9 | 1.3 |
| Electricity | 2.9 | 2.1 | 1.6 | 1.2 | 0.9 | 1.4 |
| Other Fuels | 0.4 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 |
| **Total fuel expenditure** | **5.6** | **4.2** | **3.3** | **2.6** | **2.0** | **2.9** |

Source: Expenditure and Food Survey, 2004/05, Office for National Statistics

### Fuel purchases as a percentage of total household expenditure

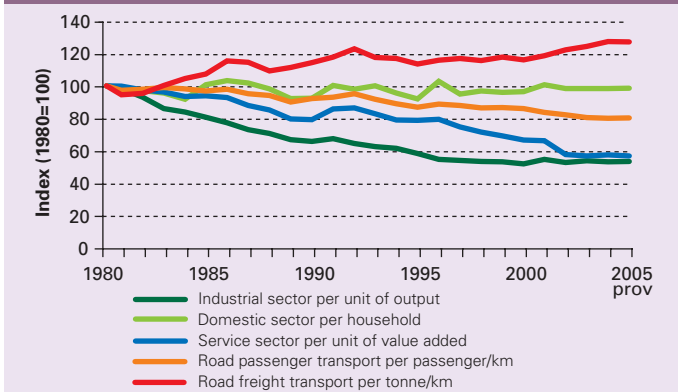
| | **1980** | **1990** | **2000/01** | **2002/03** | **2003/04** | **2004/05** |
|---|---|---|---|---|---|---|
| Gas | 1.6 | 1.7 | 1.2 | 1.3 | 1.3 | 1.3 |
| Electricity | 2.7 | 2.3 | 1.6 | 1.4 | 1.4 | 1.4 |
| Coal and Coke | 0.9 | 0.3 | 0.3 | 0.2 | 0.2 | 0.3 |
| Heating oil | 0.4 | 0.2 | | | | |
| **Total** | **5.6** | **4.5** | **3.1** | **2.9** | **2.9** | **2.9** |

Source: Expenditure and Food Survey, (formally Family Expenditure Survey), Office for National Statistics

(1) includes non-consuming households

A household in the highest income decile (ie. the 10% of households with the highest income) spent more than twice as much on fuel in 2004/05 as a household in the lowest decile (with differences similar for all fuels), However, as total expenditure for the highest decile is over 6 times more than for the lowest, fuel expenditure counts for a far higher proportion of total expenditure for households on lower incomes. The percentage of expenditure on fuel for low-income households is almost double that of the average household and two and a half times as large compared to the highest earners. There has been no change in the total percentage amount spent on fuel, a figure which has remained constant at 2.9% between 2001/02 and 2004/05.

**Energy efficiency, 1980 to 2005**




Tonnes of oil equivalent

| | 1980 | 1990 | 2000 | 2003 | 2004 | 2005 prov |
|---|---|---|---|---|---|---|
| Industrial energy consumption per million units of GVA | 362.8 | 236.4 | 189.2 | 189.5 | 184.2 | 188.0 |
| Domestic energy consumption per household | 2.0 | 1.8 | 1.9 | 1.9 | 1.9 | 1.8 |
| Service sector energy consumption per million units of GVA | 83.0 | 65.1 | 54.7 | 46.5 | 47.2 | 44.6 |
| Road passenger energy consumption per million passenger-kilometres | 45.7 | 41.9 | 39.1 | 36.5 | 36.4 | 36.5 |
| Road freight energy consumption per million freight-kilometres | 76.3 | 86.8 | 88.1 | 94.4 | 96.6 | 96.6 |

Energy consumption per unit of output, known as energy intensity, gives a broad indication of how efficiently energy is being used over time. Changes in energy intensity can occur for a number of reasons: process change, technological change and structural change (in the case of industry and the service sector) as well as efficiency change. The largest fall in energy intensity over the last thirty years has occurred in the industrial sector and is mainly due to structural change. The largest increase has occurred in the road freight transport sector where the move towards heavier vehicles has resulted in higher levels of energy consumption, although the trend has been relatively stable over the last decade.

# CONTACTS

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# CONVERSION FACTORS AND DEFINITIONS

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

| | to: **Thousand toe** | **TJ** | **GWh** | **Million therms** |
|---|---|---|---|---|
| | *multiply by* | | | |
| from: **Thousand toe** | 1 | 41.868 | 11.630 | 0.39683 |
| **TJ** | 0.023885 | 1 | 0.27778 | 0.0094778 |
| **GWh** | 0.085985 | 3.6000 | 1 | 0.034121 |
| **Million therms** | 2.5200 | 105.51 | 29.307 | 1 |

Data relating to the energy content of fuels are on a gross calorific value basis.
Prices are presented in real terms ie the effect of inflation has been removed by adjusting each series using the GDP deflator.
The symbol '-' is used in the tables where the figure is zero or less than half the final digit shown, and '..' is used to indicate 'not available'.
The Department of Trade and Industry is the source of all data except where stated.
All figures are for the United Kingdom, except for page 9.

The Department for Trade and Industry also produce the following publications:

**Energy Trends** is a quarterly publication that contains tables, charts and commentary covering all major aspects of energy. It provides a comprehensive picture of energy production and use, to allow readers to monitor trends during the year, and complements the annual Digest of United Kingdom Energy Statistics publication. It is available on annual subscription (June 2006 to March 2007) together with Quarterly Energy Prices (see below) from the DTI, priced at £40 for UK subscribers, or it can be accessed via DTI's energy website:
www.dti.gov.uk/energy/statistics/publications/trends/index.html.
A subscription form can be downloaded from this page. Single copies are available from DTI Publications Orderline 0845 015 0010 priced £6.
For further information call Clive Sarjantson on 020 7215 2698.
Monthly updates to tables in Energy Trends are split by fuel source and can be found at:
http://www.dti.gov.uk/energy/statistics/source/index.html.

**Quarterly Energy Prices** is a quarterly publication that contains tables, charts and commentary covering energy prices, to domestic and industrial consumers, for all the major fuels. It also presents comparisons of fuel prices in the European Union and G7 countries. Subscriptions run alongside Energy Trends (see above), or material can be accessed via DTI's website:
http://www.dti.gov.uk/energy/statistics/publications/prices/index.html.
Single copies are available from the DTI Publications Orderline 0845 015 0010 priced £8 For further information call Peter Matejic on 020 7215 2720.

**The Digest of UK Energy Statistics 2006** is the annual energy statistics publication of the DTI. With extensive tables, charts and commentary covering all the major aspects of energy, it provides a detailed and comprehensive picture of the last three years and a detailed picture for the last five years. It includes detailed information on the production and consumption of individual fuels and of energy as a whole. The 2006 edition was published by The Stationery Office on 27 July 2006 and costs £40. It can also be accessed via DTI's energy website:
http://www.dti.gov.uk/energy/statistics/publications/dukes/page29812.html.

**Energy Sector Indicators 2006** was published on 9 June 2006 as a supplement to the Third Annual Report on the Energy White Paper (see below). The content 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. The four key indicators and 28 further supporting indicators are available free in hardcopy from DTI Publications Orderline: 0845 015 0010. Alternatively, the material is published along with a full set of 152 background indicators (charts and tables) on the DTI website at:
http://www.dti.gov.uk/energy/statistics/publications/indicators/page29741.html

# REFERENCES

Publication of **Development of UK Oil and Gas Resources,** commonly known as the "Brown Book", ended with the 2001 edition. Up-to-date information on the UK offshore industry is available via DTI's Oil and Gas website: http://www.og.dti.gov.uk

**Energy Consumption** in the United Kingdom brings together statistics from a variety of sources to produce a comprehensive review of energy consumption in the UK since the 1970s. The data illustrate key trends in energy consumption in the UK since 1970 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. It includes an analysis of the factors driving the changes in energy consumption, the impact of increasing activity, increased efficiency, and structural change in the economy.
http://www.dti.gov.uk/energy/statistics/publications/energy-consumption/page17658.html

The Government's **Energy White Paper**, "Our energy future – creating a low carbon economy", was published by the Secretary of State for Trade and Industry on 24 February 2003. The report addresses the challenges facing energy, by setting out a long-term strategic vision for energy policy. It is the product of extensive consultative and analytical work and has over 6,500 contributions. The White Paper is available on the DTI website at http://www.dti.gov.uk/energy/policy-strategy/energy-white-paper/page21223.html and in hard copy from The Stationery Office.

The Third Annual Report, on the implementation of the White Paper was published in July 2006 and reviews progress over the last 12 months and the way ahead. It is available on the DTI website at the same address.

**UK Energy and $CO_2$ emissions projection: updated projections to 2020**
This paper provides key information on updated energy and emission projections. The projections represent key underpinning analysis for the government's review of the Climate Change Programme. The projections will also feed into decision making on allocations for the second phase of the EU ETS. The 69 page document illustrates the historic and projected trends in final energy demand and carbon intensity and the impact of the current Climate Change Programme measures. The report includes assessments of outputs from the UK's energy supply industries and of fuel mix within the electricity generating sector. The report is to be found at:
http://www.dti.gov.uk/files/file26363.pdf

# REFERENCES

**The UK Fuel Poverty Strategy, 4th Annual Progress Report 2006** is produced by Defra and the Department of Trade and Industry in association with the Devolved Administrations. This report sets out the progress that has been made on tackling fuel poverty and is available to view at
http://www.dti.gov.uk/files/file29688.pdf
It is accompanied by detailed annexes published on the DTI website at:
http://www.dti.gov.uk/energy/fuel-poverty/strategy/index.html

The fourth annual report is also available free from DTI, Publications Orderline, Admail 528, London, SW1W 8YT. Tel. 0845 015 0010, Fax 0845 015 0020,
E-mail: publications@dti.gsi.gov.uk .

**Energy – Its Impact on the environment and society** outlines the environmental and social impacts of energy production and use. It includes information on carbon dioxide and other emissions, the environmental consequences of energy production and supply activities and an analysis of the drivers of energy demand. It also covers the evolution and impact of competition on the energy market, quality of service and fuel poverty. Available from the Department of Trade and Industry, telephone number: 020 7215 2698. It can also be accessed via DTI's website:
http://www.dti.gov.uk/energy/environment/energy-impact/page20248.html.

The cover illustration used for UK Energy in Brief and other 2005-2006 DTI energy statistics publications is from a photograph by Peter Askew. It was a winning entry in the DTI News Photographic Competition in 2002.

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