UK ENERGY SECTOR INDICATORS 2007

A supplement to the Fourth Annual Report on progress towards the 2003 Energy White Paper goals

INTRODUCTION

In February 2003, the Energy White Paper "Our Energy Future – Creating a Low Carbon Economy" set out a new framework for energy policy. It contained four goals:

- **To put ourselves on a path to cut the UK's CO_2 emissions – the main contributor to global warming – by some 60% by about 2050, as recommended by the Royal Commission on Environmental Pollution (RCEP), with real progress by 2020.**
- **To maintain the reliability of energy supplies**
- **To sustain our industrial and business competitiveness**
- **To ensure that every home is adequately and affordably heated**

2. Thus the first goal for current energy policy is **environmental sustainability** and, in particular, putting the UK on a path to reduce carbon dioxide emissions by some 60% by about 2050. The quality of the environment has always been important but climate change is now a reality. The worst effects of climate change can be avoided if concentrations of greenhouse gases in the atmosphere can be stabilised. We can reduce carbon dioxide emissions by reducing the amount of energy we consume, combined with a rapid acceleration in electricity generation through renewable energy.

3. The second goal is to maintain the **reliability of Britain's energy supplies**, so that people and businesses can rely on secure supplies of energy. Reliable energy supplies are fundamental to the economy as a whole and to sustainable development. An adequate level of energy security must be satisfied at all times in both the short and longer term. This requires the right infrastructure and regulatory system at home and liberalised energy markets in Europe. It also means pursuing closer international relationships to promote regional stability and economic reform in key energy producing areas of the world.

4. The third goal is to **raise the sustainable rate of economic growth and our industrial and business competitiveness** through competitive energy markets that are reliable and affordable. It is important for our economy and for our productivity that the cost of energy does not threaten the overall competitiveness of UK business or discourage inward investment. Equally it is important to business and consumers generally that energy for manufacturing processes, heating, lighting, cooking, powering IT and so on, is affordable. Liberalised and competitive markets will continue to be a cornerstone of energy policy. Where the market alone cannot create the right signals (for example on the environment) we will take steps that encourage business to innovate and develop new opportunities to deliver the outcomes we are seeking.

5. The final and fourth goal is to achieve our **social objectives and ensure that every home is adequately and affordably heated.** Our policies should take account of impacts on all sectors of society and specific measures will be needed for particular groups of people, for example, to tackle fuel poverty.

6. These four goals are designed to be achieved together.

7. In many cases the objectives can reinforce each other. For example, improving the efficiency with which we use energy will reduce greenhouse gas emissions, help those in fuel poverty, cut energy bills for businesses and households, and support energy security by reducing demand. Additionally, other measures, such as those to encourage renewable energy, can help create new markets and new industries, alongside environmental and energy security benefits. But it is also recognised that from time to time there will be tensions between objectives. For example, extremely high energy prices would promote energy efficiency, and thereby reduce emissions. But they would also have a negative effect on people on low incomes and business.

8. For 2007, this publication is only being made available on the DTI Energy website. As last year it contains only the four **key indicators**, one for each goal and the 28 **supporting indicators.** The full range of **background energy indicators** can also be found on the DTI Energy web site at www.dti.gov.uk/energy/statistics/publications/indicators/page39558.html. Thus the full range of indicators as published in "UK Energy Sector Indicators 2005" remains available.

9. Except where the supporting indicators are summaries of the background indicators, the 28 supporting indicators are repeated in the appropriate sections of the background indicators so as to set them in a wider context.

10. This remains an evolving set of indicators and work will continue to develop new indicators in a number of areas. The work of the Joint Energy Security of Supply Working Group (www.dti.gov.uk/energy/reliability/security-supply/jess/index.html) has developed further, forward-looking indicators on security of supply and the annex to the Government's Annual Progress Report on UK fuel poverty strategy (www.dti.gov.uk/energy/fuel-poverty/strategy/index.html) includes a wide range of social indicators.

LIST OF CHARTS AND TABLES

Key White Paper Indicators

Supporting Indicators

Low carbon

Reliability

Competitiveness

Fuel poverty

Background indicators not included in this document can be found on the DTI Energy Web site at www.dti.gov.uk/energy/statistics/publications/indicators/page39558.html are:

Background Indicators

List of charts and tables

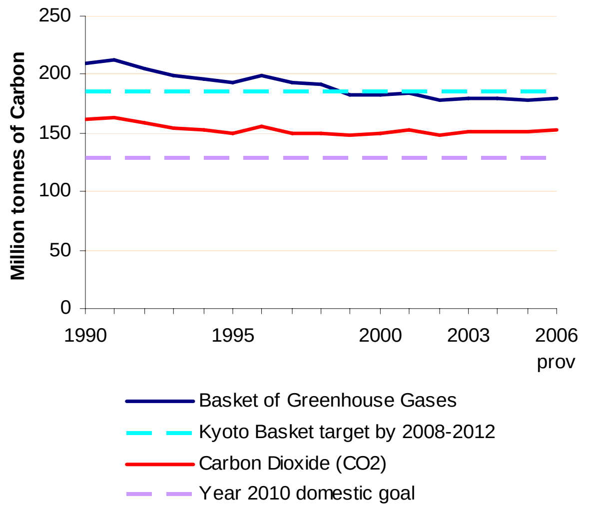
E12 Energy and the Environment

Key indicators

The four key indicators set out below help to capture in headline form the progress we have made in implementing the four goals for our energy policy set out in the 2003 Energy White Paper.

1 Low carbon

Greenhouse gas and carbon dioxide emissions

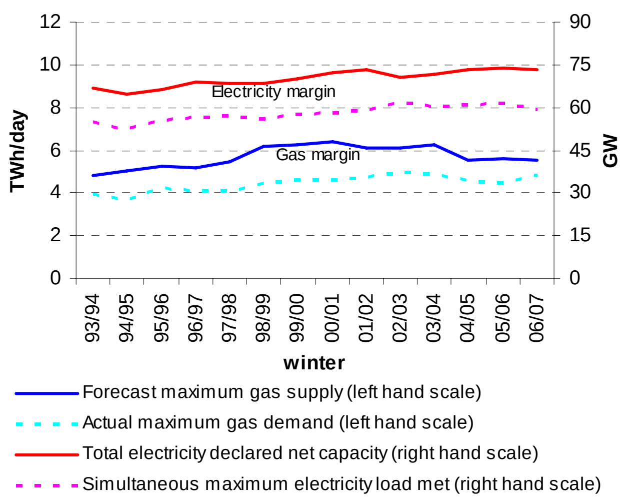


2006 figures are Department of Trade and Industry provisional estimates
Source: Department for Environment, Food and Rural Affairs

- Net emissions of carbon dioxide fell by 5¼% between 1990 and 2006. Estimates based on energy production and consumption in 2006 indicate that emissions rose by 1¼% during 2006. The increase in 2006 resulted from fuel switching from natural gas and nuclear to coal for electricity generation.
- Emissions of the ‘basket’ of six greenhouse gases, weighted by global warming potential, fell by about 15% between 1990 and 2006.
- Carbon dioxide currently accounts for 84% of total UK greenhouse emissions with methane and nitrous oxide contributing around 8% and 6% respectively. Of the three remaining components hydrofluorocarbons (HFC) contributed about 1% and perfluorocarbons (PFC) and sulphur hexafluoride (SF_6) a total of ¼%.

2 Reliability

Gas and electricity capacity margins - maximum supply and maximum demand 1993/94 to 2006/07

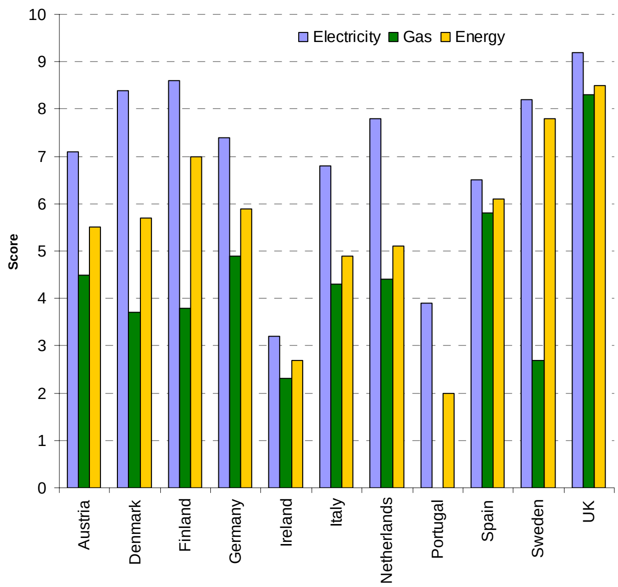


Data for winter 2006/07 are provisional
Source: National Grid and Department of Trade and Industry

- 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 remained for the mild winter 2006/07. One new plant began to operate in Northern Ireland in 2005/06. In Great Britain the plant margin rose from around 20% in 2004/05 to 25% for the winter period in 2006/07.
- For gas, Liquefied Natural Gas (LNG) imports and two new pipeline routes almost balanced the reduction in indigenous supply in 2006/07 and will further increase supply in 2007/08. As gas prices eased back, gas demand was higher than each of the two previous years.

3 Competitiveness

Overall competitiveness score for selected EU energy markets (using preliminary 2005 data)

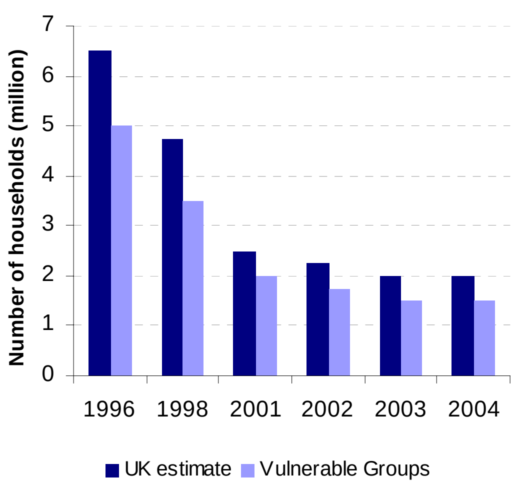


Source: Study undertaken by OXERA on behalf of Department of Trade and Industry

- The methodology for assessing the competitiveness of energy markets was developed by OXERA on behalf of Department of Trade and Industry, 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. The methodology used is designed to be both analytically robust, drawing on well-identified indicators of market competitiveness from economic theory, and practical for the purpose of annual assessment. An initial sift is used on all EU and G7 countries to identify those with the most competitive markets, which then undergo a more detailed analysis. The final report which sets out the methodology in more detail is available at www.dti.gov.uk/files/file35324.pdf .

4 Fuel Poverty

Number of households in Fuel Poverty (UK)



Source: Department of Trade and Industry,
For further details on fuel poverty see
www.dti.gov.uk/energy/fuel-poverty/index.html

- The latest estimates show that the number of vulnerable fuel poor households in the UK has fallen from about 5 million in 1996 to around 1½ million in 2004.

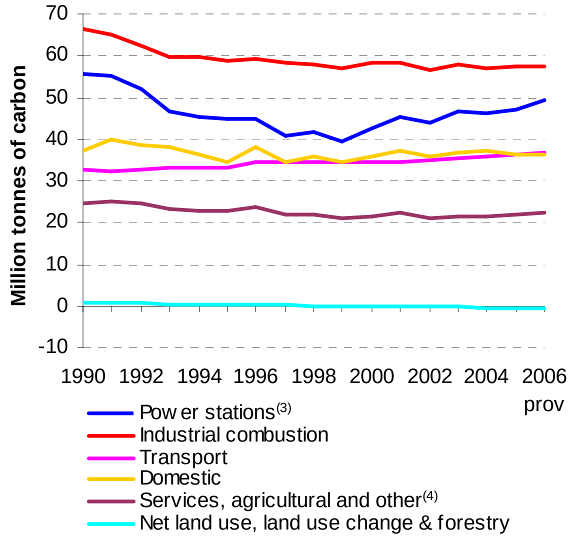
- Since 2003, prices have begun to rise, with all the energy supply companies having introduced significant increases to date. Analysis of the overall effects of changes in fuel prices and incomes, excluding consideration of energy efficiency improvements, suggests that the total number of vulnerable households in fuel poverty is likely to rise by around one million households in England between 2004 and 2006, with a proportional rise in figures for the Devolved Administrations.

Supporting indicators

The 28 supporting indicators set out below explain in more detail the trends shown by the Key indicators and the progress to date described in the 2007 Annual Report on the Energy White Paper.

1 Low carbon economy

1.1 Total carbon dioxide emissions by sector(1)(2)

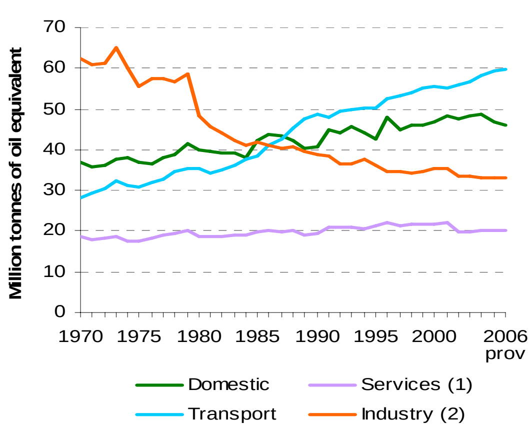


- It is estimated that 153 million tonnes of carbon (MtC) were emitted – as carbon dioxide – during 2006. Carbon dioxide emissions have fallen by 5¼% since 1990.
- Power stations are the largest single source of carbon dioxide emissions. However if the emissions from power stations were re-allocated to the sector consuming the electricity, the industrial sector dominates.
- Around 21 MtC out of the 49 MtC emitted from power stations can be allocated to industry; 14½ MtC results from domestic electricity consumption, and 12½ MtC comes from the service sector. A further 1 MtC can be allocated to the transport sector.

(1) Emissions on Intergovernmental Panel on Climate Change (IPCC) basis.
(2) 2006 figures are Department of Trade and Industry provisional estimates.
(3) Power station emissions have been split between, and added to, Industrial combustion, Transport, Domestic and Services in proportion to each sectors electricity consumption. The emissions from power stations are also shown separately.
(4) Includes commercial and public service, military aircraft and naval vessels, fugitive emissions from solid fuels and natural gas and waste.

Source: Department for Environment Food and Rural Affairs

1.2 Final energy consumption by sector

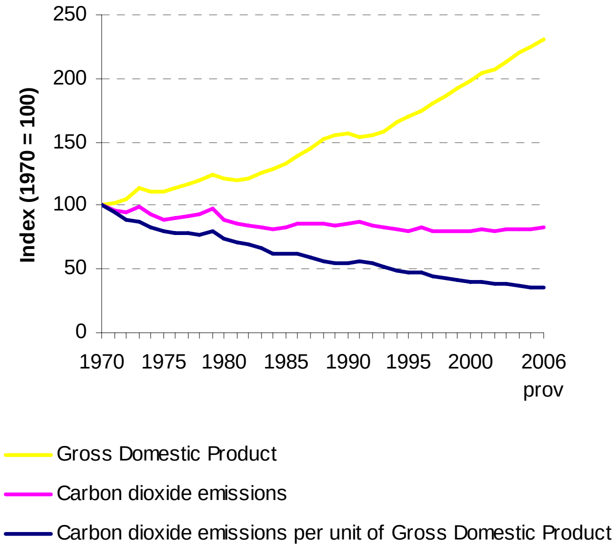


- Transport has been the biggest single energy user in the UK for the past 18 years. It accounted for 38% of final energy use in 2006.
- Households are responsible for 29% of final energy use, whilst industrial consumption now accounts for 21%.
- The remaining 13% of final energy is used by the services and agriculture sector.

(1) Services include the commercial sector, public administration and agriculture.
(2) Industry includes construction.

Source: Department of Trade and Industry

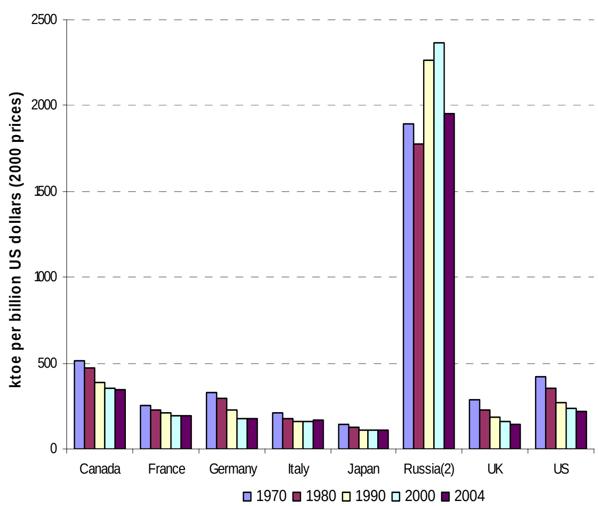
1.3 Carbon intensity, carbon dioxide emissions per unit of GDP



Source: Department for Environment, Food and Rural Affairs; Office for National Statistics

- Carbon dioxide emissions per unit of Gross Domestic Product (GDP) decreased by 64% between 1970 and 2006 while GDP increased by 131%.
- Carbon dioxide emissions have fallen steadily over the period despite substantial economic growth. This is due to energy being used in a more efficient way; changes in the structure of the economy; and the increased use of fuels that are less carbon intensive.

1.4 Energy ratio(1) in G8 countries

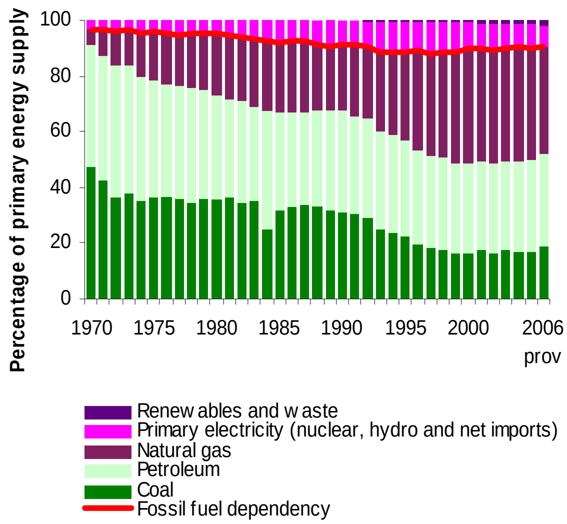


(1) Energy consumption (thousand tonnes of oil equivalent) per billion US dollars (2000 prices).
(2) Russia data for 1970 to 1990 estimated from Former USSR data.

Source: International Energy Agency

- The energy ratio is the ratio of overall primary energy consumption to GDP at constant prices. Differences between countries reflect many factors including climatic differences, the dependence on energy intensive industries, the relative importance of transport, and the efficiency in the use of energy in all sectors of the economy.
- All G8 countries except Russia have seen improvements in the energy ratio since 1970 with growth in GDP outstripping that of primary energy consumption. In Russia the ratio has improved since 2000. Of the remaining countries Japan, in percentage terms, has seen the smallest improvement in the ratio since 1970, with GDP growing only slightly faster than energy use.

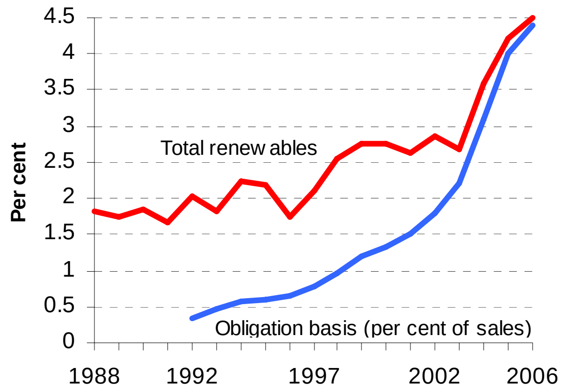
1.5 Shares of fuels contributing to primary energy supply; fossil fuel dependency



- The mix of primary fuels consumed for energy purposes in the UK has become increasingly diverse since 1960.
- In 1984 the miners strike led to a fall in the coal consumed and a drop in the diversity of supply as oil's share of supply rose.
- In the 1990s coal consumption continued to fall as the amount of natural gas consumed increased. Coal consumption remained steady between 1997 and 2005. Provisional figures for 2006 show coal consumption rising by 11% on 2005. This results from more coal being used to generate electricity.
- Fossil fuel dependency can be measured as the proportion of primary energy supply met by coal, oil or gas. The overall trend has been that fossil fuel dependency has been falling gradually since 1960. Dependency has increased slightly since 1997.

Source: Department of Trade and Industry

1.6 Proportion of electricity generated by renewables 1988 to 2006



2006 data are provisional estimates

- Renewables provided 4.2% of the electricity generated in the UK in 2005 and the expectation is that this will have risen to 4.5% in 2006.

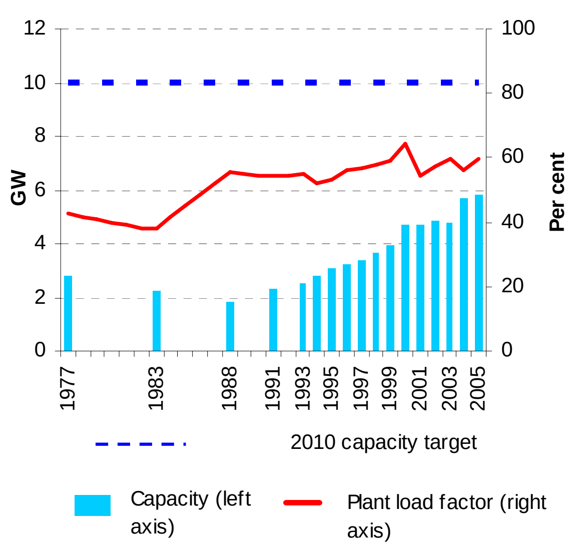
- The amount of electricity produced using hydro sources of energy varies from year to year depending on the rainfall. Low precipitation resulted in low hydro output during 2001 and 2003 hence the fall in generation from renewables in those years. Hydro output was also low because of dry weather in 2006.

- Renewables included in the "Renewables Obligation", (ie biofuels, wave, solar photovoltaics, onshore/offshore wind and small scale and re-furbished hydro) accounted for over 75% of generation from renewables in 2005 and it is estimated that this will have risen to over 80% in 2006.

Source: Department of Trade and Industry

The aim of the Renewables Obligation (RO) is to increase the contribution of electricity from renewables in the UK so that by 2010 10% of licensed UK electricity sales should be from sources eligible for the RO, rising to 15% by 2015. Certain generating plants using renewables and wastes are excluded from the list of eligible sources. These exclusions are existing hydro plant of over 20 MW; all plants using renewable sources built before 1990 (unless re-furbished); plants using energy from mixed waste combustion unless the waste is first converted to fuel using advanced conversion technology. Only the biodegradable fraction of any waste is eligible. All stations outside the UK are also excluded.

1.7 CHP capacity for electricity generation and average load factor



- Between 1994 and 2005 the electricity generation capacity of CHP plants doubled.

- The plant load factor measures how intensively the CHP plants were used. The average load factor peaked in 2000 at 64% then fell sharply in 2001 to 54% with high gas prices playing a role in the reduction, but picked up slightly in 2003 to nearly 60% and maintained that level in 2005.

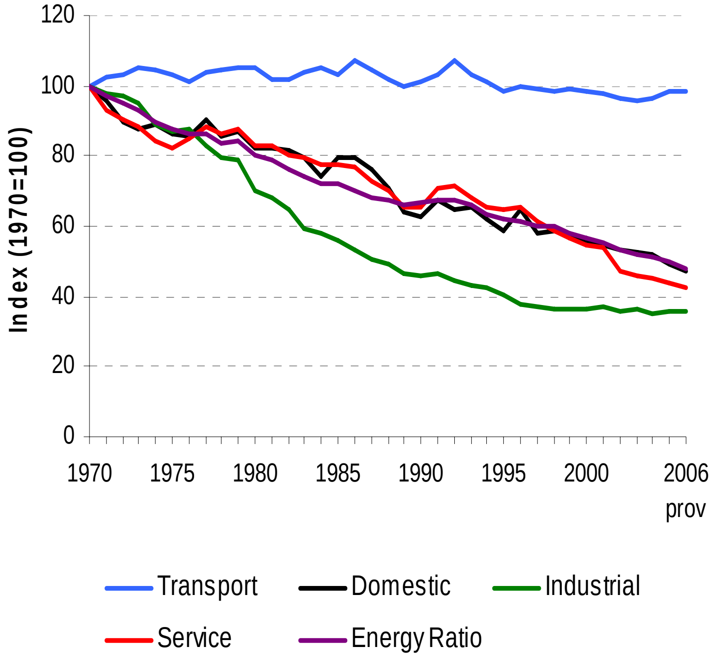
- In 2005 CHP provided 7% of all the electricity generating capacity in the UK.

- The Government's target is for at least 10,000 MWe of good quality CHP by 2010 as part of the UK's Climate Change Programme. In 2004, there was a net increase of over 900 MWe taking capacity above 5,000 MWe and a further 100 MWe were added in 2005.

Source: Department of Trade and Industry and AEA Energy and Environment

The main purpose of a number of CHP schemes is the generation of electricity including export to others. Such schemes may not be sized to use all of the available heat. The total capacity and output of these schemes have been scaled back using the methodologies outlined in the CHP Quality Assurance scheme (CHPQA). Only the portion of the capacity and output that qualifies as Good Quality is counted in the capacity figures used in this indicator.

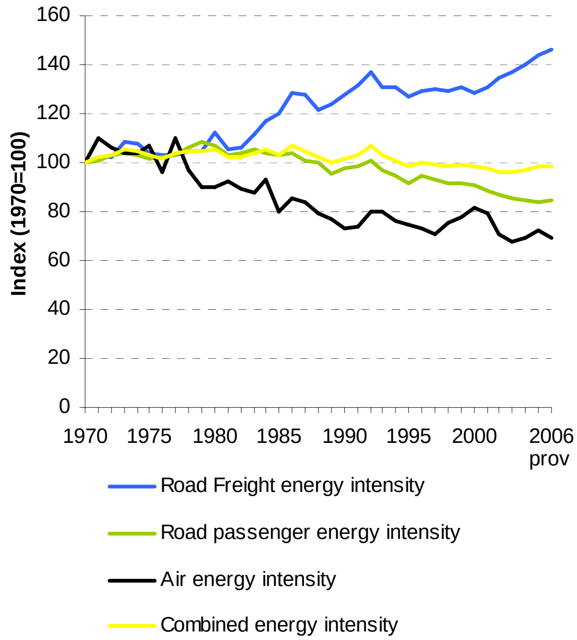
1.8 Energy intensity



Source: Building Research Establishment; Department for Environment, Food and Rural Affairs; Office for National Statistics; Department of Trade and Industry

- Total industrial energy consumption has fallen by 47% since 1970. Over the same period industrial output has risen by 48%. As result energy consumption per unit of output, (energy intensity), has fallen by 64% since 1970.
- While there have been overall increases in energy efficiency over this period, there has also been a decline in the importance of energy intensive industries and considerable fuel switching.
- Energy intensity in the service sector has fallen 58% since 1970, as output has risen at a significantly faster rate than energy consumption. Most of the fall in intensity is likely to be due to higher efficiency although structural change within the sector has also brought about some reduction in energy use.
- Energy intensity in the domestic sector has fallen 52% since 1970, due to a fast increase in total household disposable income and a much slower increase in domestic energy consumption.
- By contrast, energy intensity in the transport sector has remained fairly flat over the last 30 years, and is currently 2% lower than in 1970.

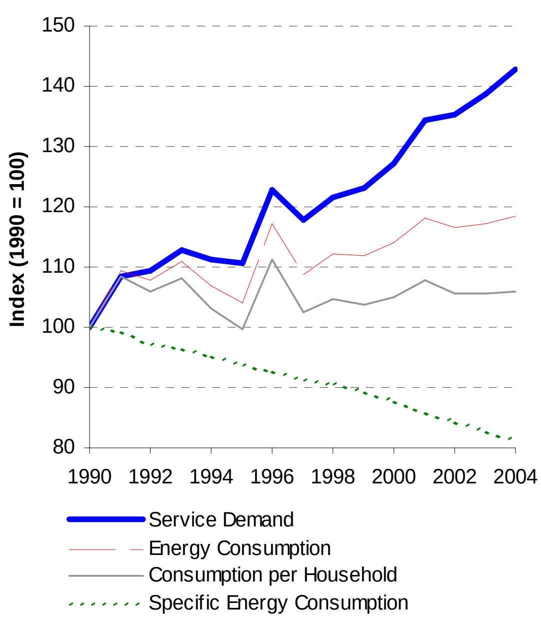
1.9 Energy intensities for road passengers, road freight and air



Source: Department for Transport, Department of Trade and Industry

- Fuel use by road passenger vehicles has increased by 72% since 1970.
- Over the same period the distance travelled by passengers has doubled, while energy consumption per passenger kilometre fell slightly.
- Fuel use for freight transport has nearly trebled since 1970, whilst the number of tonne kilometres has risen by 93%.
- Goods vehicles on average use more fuel per km than in 1970, but also carry more goods.
- Energy consumption per tonne/km of goods transported which remained relatively stable during the 1970s, appeared to have a general upwards trend up to 1992 when it reached 37% higher than 1970. Having fallen back slightly in the mid 1990's, it rose again and the provisional 2006 figure was 46% above the 1970 level.

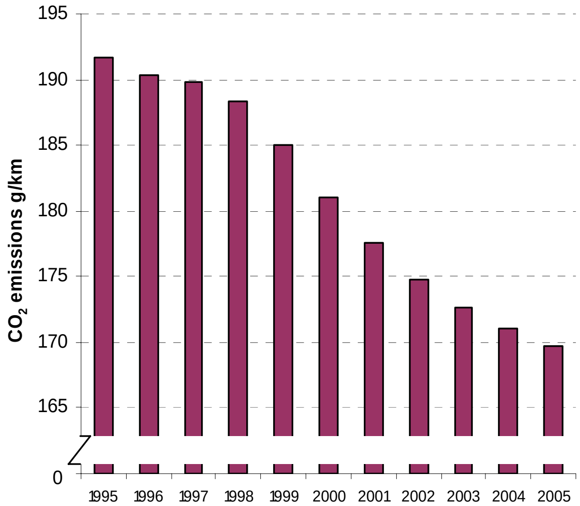
1.10 Specific Energy Consumption for Households



Source: Department for Environment Food and Rural Affairs

- Specific energy consumption is defined as the change in the energy required to produce a constant level of energy service in households. It is a modelled alternative to energy intensity, and takes account of changes in energy service demand (such as level of household comfort or hot water use).
- Service demand and energy consumption, which are both dominated by space heating, show a fluctuating trend because of variations in the weather from year to year. However the specific energy consumption, which is dominated by cumulative insulation levels and boiler efficiencies, behaves much more steadily.

1.11 Average new car CO_2 emissions

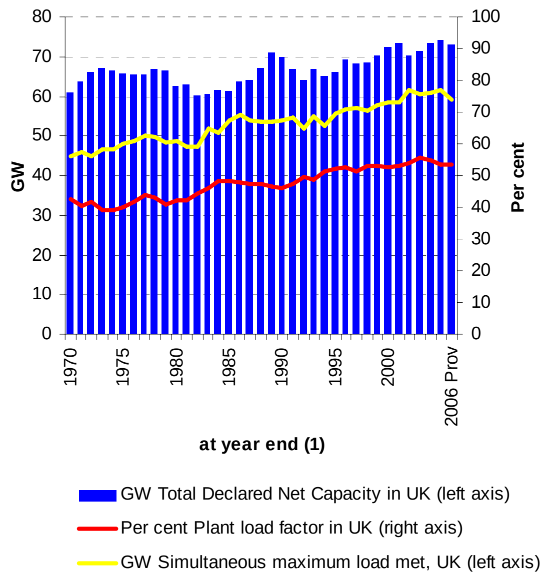


- Carbon dioxide emissions from new cars have fallen steadily since 1995. Emissions in 2005, at an average of 170g/km, were 11% lower than in 1995.

Source: Department for Transport, DVLA

2. Reliability

2.1 Electricity generating capacity, average load factor and simultaneous maximum load met for major power producers



(1) Before 1997 capacities are as at the end of March of the following year. Figures prior to 1985 are for GB

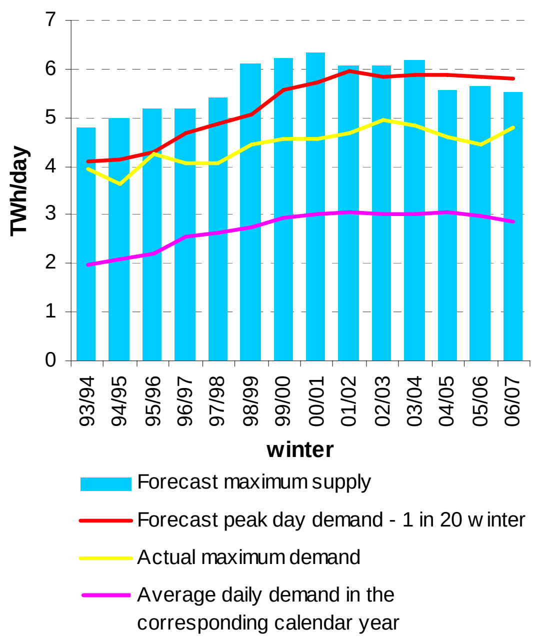
Source: Department of Trade and Industry

- Total electricity generating capacity remained within the 60 to 70 GW band between 1970 and 1999, but after that started rising and exceeded 74 GW at the end of 2005 but has fallen back in 2006 with the closure of two Magnox nuclear stations.

- Since the 1970s the capacity utilised (ie the load factor) has risen from around 40% to 56% in 2003, falling back a little to 53% in 2006. There was a sharper increase in the 1990s with the growth in the use of Combined Cycle Gas Turbines, which in 2006 accounted for 34% of the electricity supplied by major power producers, having been 38% in 2004.

- Maximum demand in 2005/06 was slightly less than the record high of 61.7 GW recorded in 2002/03. In 2006/07 warm weather saw maximum demand 2.6 GW lower than the record. In 2002/03 maximum demand was equal to 87½% of the capacity of major power producers. However, in 2006/07 it was equivalent to only about 80% of the capacity of major power producers.

2.2 Gas capacity - maximum supply, maximum demand and peak 1 in 20 winter estimated demand



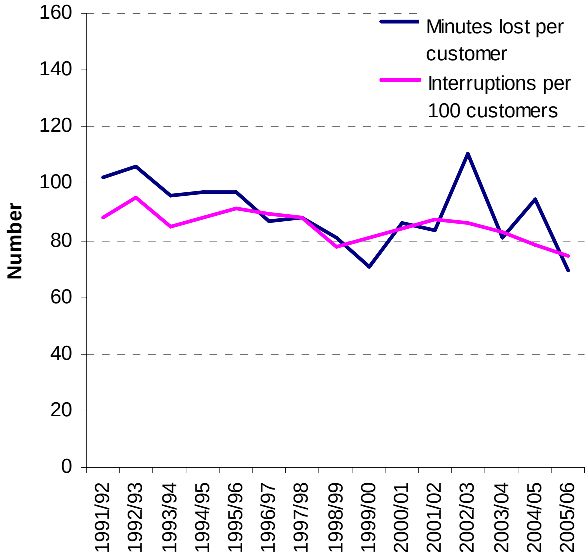
Source: National Grid and Department of Trade and Industry

- Between the winter of 1993/94 and the winter of 2006/07 the estimated maximum amount of gas that could be supplied to the UK from offshore and onshore production, storage and Europe has exceeded actual maximum winter demand by between 16 and 39%.

- Maximum supply was forecast to be less than peak gas demand forecast for a one in twenty (1:20) winter day in each of 2004/05, 2005/06 and 2006/07. However, none of these winters approached the 1 in 20 level and high gas prices brought a demand side response in 2005/06.

- The seasonal variation in gas demand means that on average during the year daily gas demand is only two thirds of maximum winter demand. In the early 1990s, before the use of gas for electricity generation, gas demand was more seasonal and the daily average demand was only around half the winter maximum.

2.3 Security and availability of electricity supply for the average customer

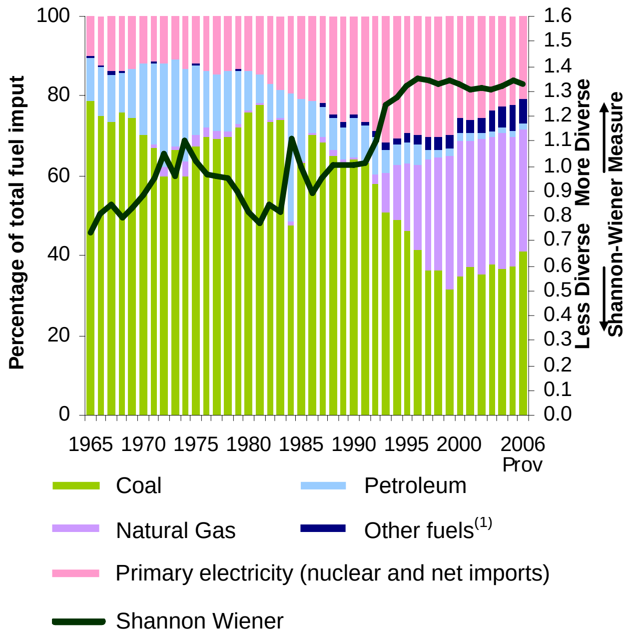


Source: Ofgem

- As shown in chart 2.3, during 2005/06 there were 74.6 interruptions per 100 customers. This was lower than the 2004/05 figure of 78.4 per 100 customers, representing a decrease of 4.8%.

- The average length of time without supply in 2005/06 was 69.5 minutes per customer. This was lower than the 2004/05 figure of 94.3 per 100 customers, representing an decrease of 26.3%. However, the 2004/05 average was principally as a result of the storms in January 2005.

2.4 Shares and diversity of fuels used for electricity generation(1)



Data for 2006 are provisional and for some earlier years are estimated.

(1) Mainly coke and breeze, coke oven gas, blast furnace gas and renewable sources other than hydro.

Source: Department of Trade and Industry

- Fuel use for electricity generation became more diverse through the late 1960s and early 1970s, as the share of electricity generated from petroleum grew at the expense of coal, peaking at 29% in 1972. This trend was reversed in the late 1970s.

- The 1990s saw more rapid increases in diversity, with the gas' share of fuel used for electricity generation rising to 34% in 2000 after the introduction of gas fired Combined Cycle Gas Turbines stations. This was coupled with the decreasing share of coal, down to 32% in 1999.

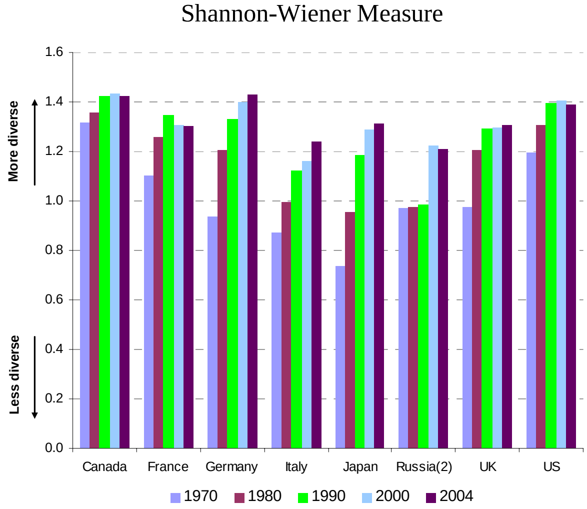
- After 2000 gas' share fell back but returned to 34% in 2004, declining again to 30% in 2006. Correspondingly coal's share picked up to 38% in 2003, fell to 37% in 2004 but has since risen to 41% in 2006. In 1999 nuclear's share fell below 25% for the first time since the early 1990s with increased outages at nuclear stations for repairs, maintenance and safety case work. With closures, nuclear's share has declined further (on this fuel input basis) to under 20% in 2006.

- Under the Shannon-Wiener measure, diversity increased in the 1970s and the use of oil in generation grew but fell back in the 1980s. It increased temporarily in 1984 during the miners strike as more oil and less coal was used. Diversity increased once more in the early 1990s with the use of gas for generation.

- After 1996 the diversity measure declined because coal, gas and nuclear have squeezed other fuels (particularly oil) from 10% of the total down to below 2%, despite the shares of these three main fuels becoming more equal. Since 1999, diversity has stabilised. Further growth in this indicator is not expected although the recent resurgence in coal use has tended to increase diversity, while nuclear's decline has pulled the indicator in the opposite direction.

See page 30 for a definition of the Shannon-Wiener statistics.

2.5 Diversity of primary energy supply (1) in G8 countries



(1) Based on the shares of five groups of fuels: coal, oil, gas, primary electricity and waste.

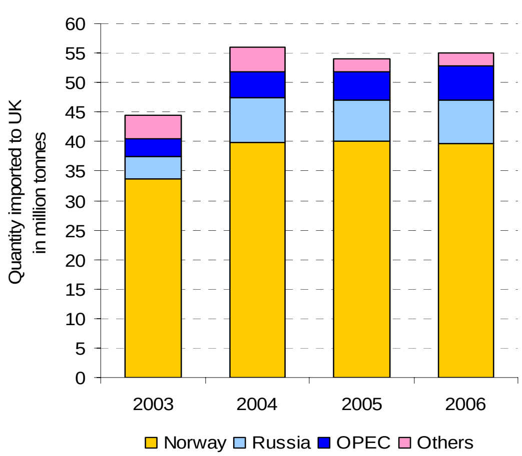
(2) Russia data for 1970 to 1990 estimated from Former USSR data.

Source: International Energy Agency

- All G8 countries have seen increases in the diversity of their energy supplies since 1970. In France the increasing dominance of nuclear power has resulted in a reversal of this trend in recent years.

See page 30 for a definition of the Shannon-Wiener statistics

2.6 Diversity of oil imports



Source: H M Revenue and Customs

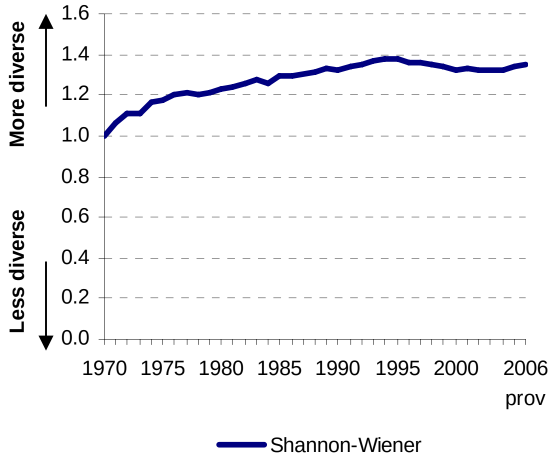
- Although an oil producer, the UK imports crude oil for various reasons. Primarily, refiners consider the type of crude oil rather than its origin. Most UK refineries use North Sea 'type' crude oil and do not differentiate between the UK and Norwegian oil. The close proximity of UK and Norwegian oil fields mean that they may use the same pipeline infrastructure.

- Some crude oils, notably from some OPEC countries, are specifically imported for the heavier hydrocarbons required for bitumen or lubricant production.

- The UK considers that open, competitive and diverse oil markets are the best means of ensuring reliable supplies at competitive prices.

2.7 Diversity of supply of primary fuels[1]

Shannon-Wiener Measure



- There was a slight increase in diversity in the early 1990s as nuclear electricity use increased.
- In the late 1990's there was a steady decline in diversity due to the growth of gas supply and decline in the use of other fuels.
- In 2001 there was a small increase in diversity due to a small decline in gas consumption and increases in the use of coal, oil, nuclear electricity and renewables and waste. Diversity decreased in 2002 and 2003 but rose slightly in 2004, 2005 and 2006.

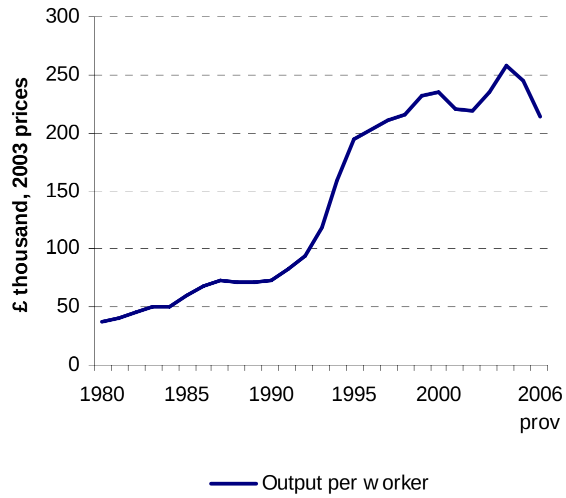
(1) Includes coal, oil, natural gas, nuclear electricity, hydro electricity, net electricity imports and renewables.

Source: Department of Trade and Industry

See page 30 for a definition of the Shannon-Wiener statistics

3. Competitiveness

3.1 Changes in the productivity of the energy industries[(1)]

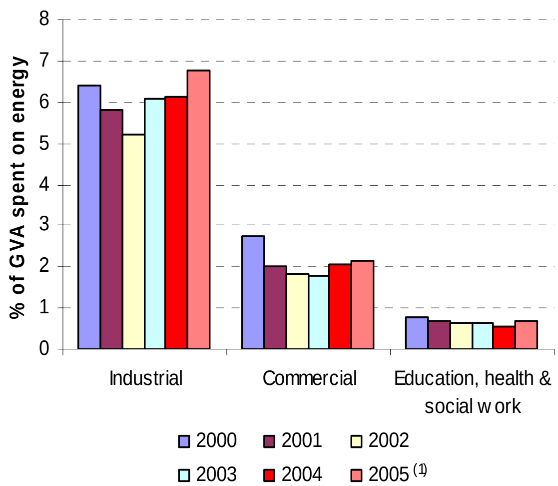


(1) Includes coal, oil, gas, electricity and the nuclear industries

Source: Office for National Statistics

- Since 1980 the productivity of the energy industries has increased nearly 6 fold and has trebled since 1990.
- Productivity peaked in 2000 at £234.8 thousand per head. It fell back slightly in 2001 and 2002. In 2004 it had reached a new record level of £257.5 thousand per head. It has fallen again in the last two years and the provisional figure for 2006 is £214.4 thousand per head.

3.2 Percentage of Gross Value Added accounted for by energy expenditure

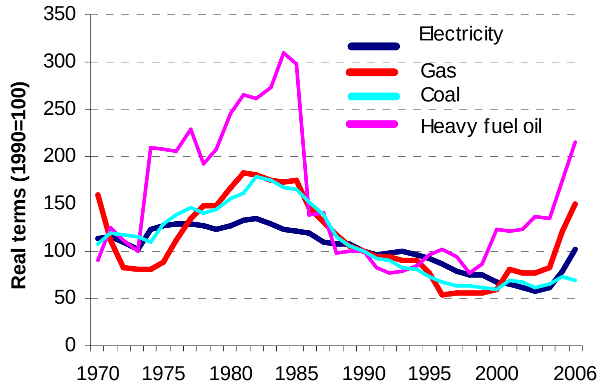


(1) 2005 figures are Department of Trade and Industry provisional estimates

Source: Office for National Statistics

- The amount of GVA spent on energy in the industrial sector is 6.8%. This is larger than the amount spent on energy in the commercial sector and the education, health and social work sector which are 2.2% and 0.7% respectively.
- GVA spent on energy in the industrial sector fell in 2001 and 2002 and has risen since. GVA spent on the commercial sector fell for three years after 2000, but has risen since. In the education, health and social work sector GVA spent on energy fell every year between 2000 and 2004, before rising in 2005.

3.3 Fuel price indices (1) (2) for the industrial sector, 1970 to 2006



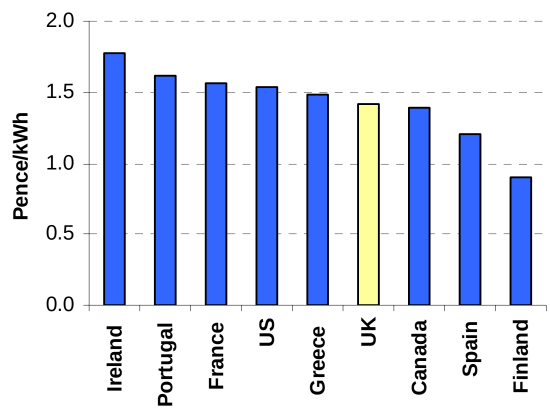
(1) Prices deflated by the GDP (market prices) deflator
(2) Including CCL

Source: Department of Trade and Industry

- In 2006, annual average real terms industrial electricity prices, including the Climate Change Levy (CCL), rose 30% when compared to 2005. The increase in the spot price of gas that started in 2005 has led to annual average gas prices including CCL, being the highest they have been since 1986. Heavy fuel oil prices were at their highest levels since 1985.

- Between 1996 and 2006, industrial fuel prices including CCL have risen in real terms by 3% for coal and 19% for electricity. Over this period the price of heavy fuel oil increased by 110% in real terms and the price of gas by 177%.

3.4 Industrial gas prices within the EU 15 and G7 in 2005: converted to UK pence per kWh(1)(2)(3)



Notes: Prices include taxes where not refunded.
(1) Converted using average 2005 exchange rates.
(2) Data not yet available for Austria, Belgium, Denmark, Germany, Italy, Japan, Luxembourg, Netherlands and Sweden.
(3) The positions of 2005 prices for Austria, Belgium, Germany, Italy, Japan and Netherlands have been estimated relative to the median and UK prices.
Source: Derived from IEA data

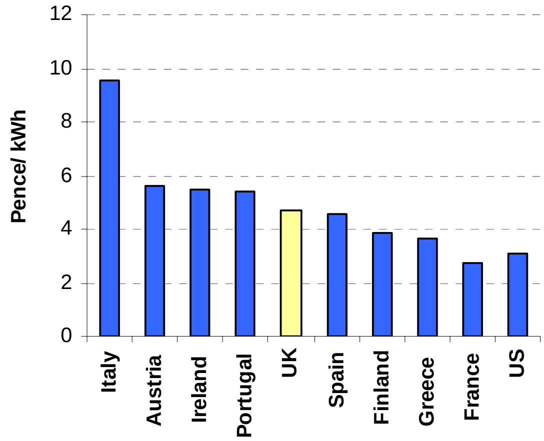
- In 2005, industrial gas prices in the UK were the fourth lowest within the EU15, and the second lowest in the G7, on a common pounds sterling currency basis.

- In comparison, UK industrial gas prices in 1995 were the lowest within the EU15 and the third lowest within the G7.

- Average industrial gas prices in the UK have been below the EU15 median (for countries where data are available) for every year since 1995.

- Average UK industrial gas prices have been below the G7 median (for countries where data are available) for every year since 1995.

3.5 Industrial electricity prices within the EU15 and G7 in 2005: converted to UK pence per kWh(1)(2)(3)



- In 2005, UK average industrial electricity prices were the seventh lowest within the EU15 and fourth lowest within the G7, on a common pounds sterling currency basis.
- In comparison, UK industrial electricity prices in 1995 were the sixth lowest within the EU15 and the fourth lowest within the G7.
- In 2005, industrial electricity prices in the UK are around the EU15 median and G7 median.

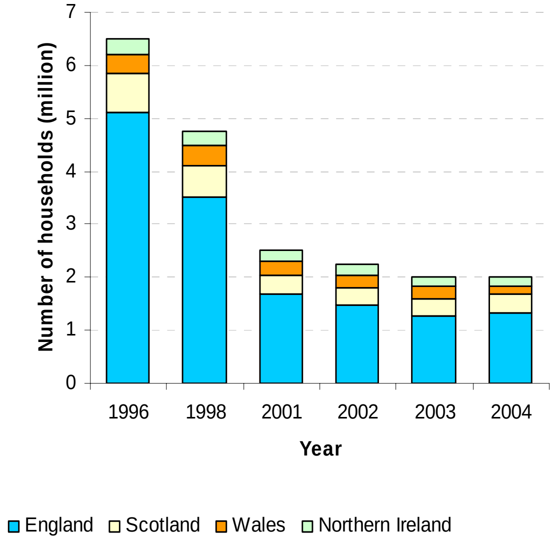
Notes: Prices include taxes where not refunded.

(1) Converted using average 2005 exchange rates.
(2) Data not yet available for Belgium, Canada, Denmark, Germany, Japan, Luxembourg, Netherlands and Sweden.
(3) The positions of 2005 prices for Belgium, Canada, Denmark, Germany, Japan, Netherlands and Sweden have been estimated relative to the median and UK prices.

Source: Derived from IEA data.

4. Fuel poverty

4.1 Total number of households in fuel poverty [1]



(1) Based on the definition including Housing Benefit and Income Support for Mortgage Interest (ISMI) as income.

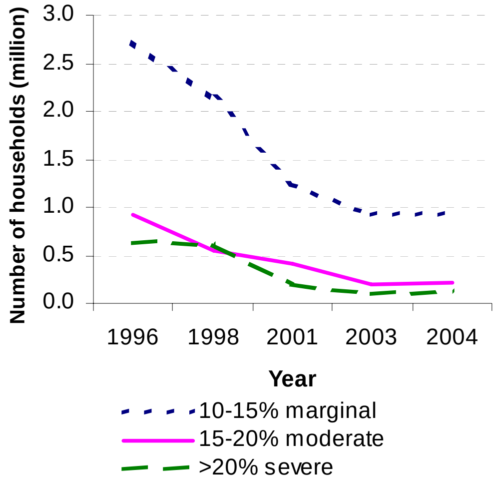
Source: England - 1996, 2001, 2003 & 2004 English House Condition Survey,Department for Communities and Local Government; 1998 Energy Follow-Up Survey, Department of Trade and Industry.
Scotland - 1996, 2002 & 2004 - Scottish House Condition Survey, Scottish Executive;
Wales - 1997/98 Welsh House Condition Survey, 2004 Welsh Household & Dwelling Survey, National Assembly for Wales;
Northern Ireland - 1995/96, 1996/97, 1997/98 Northern Ireland Family Expenditure Survey, Office for National Statistics; 2001 Northern Ireland House Condition Survey, 2004 Interim House Condition Survey, Department for Social Development.

- A fuel poor household is one that needs to spend more than 10% of its income on fuel to maintain a satisfactory heating regime. In 2004, the latest year for which estimates are available, approximately two million households in the UK were in fuel poverty, and around one and a half million of these were vulnerable households, i.e. containing children or those who are elderly, sick or disabled.

- The number of fuel poor households in the UK is estimated to have fallen by around four and a half million between 1996 and 2004. The number of fuel poor in England has fallen by approximately four million households in the same period, although there was no change between 2003 and 2004. Reduced energy prices were a significant factor in these reductions in fuel poverty in the early years.

- Energy prices rose significantly between 2004 and 2006. Analysis of the overall effects of changes in fuel prices and incomes, excluding consideration of energy efficiency improvements, suggests that the total number of vulnerable households in fuel poverty is likely to have risen by around one million households in England between 2004 and 2006, with a proportional rise in figures for the Devolved Administrations.

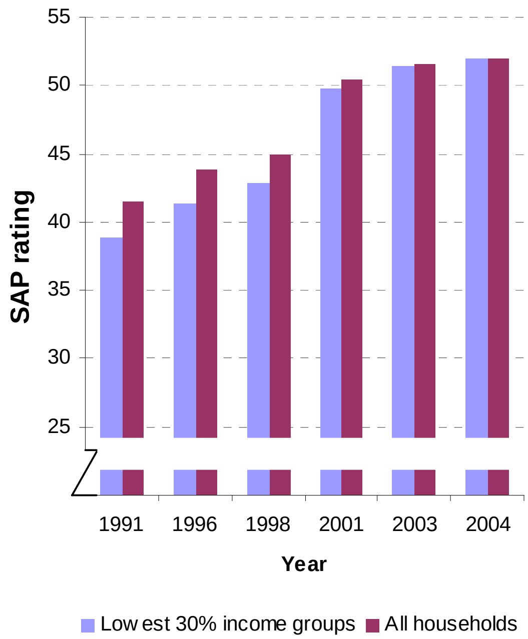
4.2 Trends in fuel poverty by severity[(1)(2)]



(1) Based on the definition including Housing Benefit and Income Support for Mortgage Interest (ISMI) as income.
(2) England only
Source: Department for Communities and Local Government

- The total number of fuel poor has been reducing significantly, and it would appear from Chart 4.2 that the greatest fall in overall numbers has occurred within the "marginal category" paying between 10% and 15% of their incomes on fuel poverty. However, a significant core remain who have to pay more than 15% of their income on fuel to maintain an adequate standard of heating, a considerably higher proportion than the national average expenditure of 3.1% (2001/02 – 2005/06). The numbers in this category have stayed about the same between 2003 and 2004.

4.3 SAP rating of households in the lowest 30% income groups and the average SAP rating for England[1]

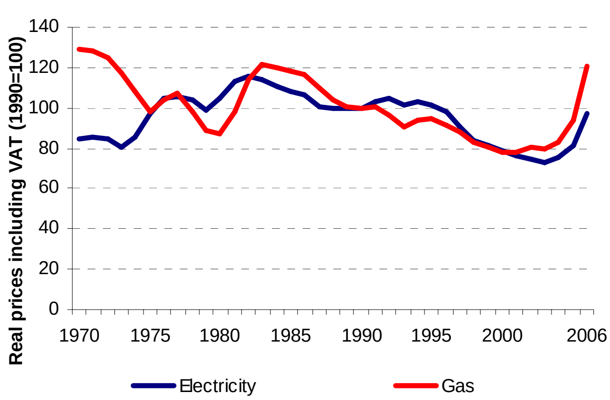


(1) Data based on EHCS 1991, 1996, 2001, 2003, 2004 and EFUS 1998.
Source: Department for Communities and Local Government, Department of Trade and Industry.

- The Standard Assessment Procedure (SAP) provides a means of rating the energy efficiency of a dwelling and is based on estimates of space and water heating costs. Under the 2001 methodology, a rating of 120 is the highest rating, while a score of 65 is considered energy efficient.
- The energy efficiency of the country's housing stock has risen from an average SAP rating of 14 in 1970 to 52 in 2004.
- The increase is due to major developments in insulation standards and the replacement of inefficient heating systems, such as open coal fires, by more efficient, mainly gas-fired, central heating.

(2) SAP (Standard Assessment Procedure) 2001. The rating takes into account heating systems and insulation in homes. The rating runs from 1 (highly inefficient) to 120 (highly efficient). It is designed to reflect the energy efficiency of the dwelling, irrespective of its size, geographical location and characteristics or behaviour of its occupants. The rating measures the cost of heating per unit of floor area, taking into consideration the rate of heat loss and the cost of supplying the lost heat. The heat loss depends on the dwelling, the thermal properties of the building fabric, the degree of insulation and level of ventilation. The cost is affected by the efficiency of the heating system, the price of the particular fuel used and any solar gain. The SAP rating takes no account of the climatic conditions in which the building is situated. In 2005, a new SAP rating from 1 to 100 was launched. The above figures are based on the 2001 methodology which has a scale of 1 to 120.

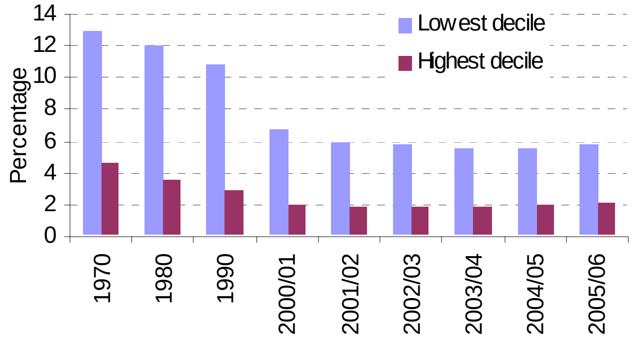
4.4 Fuel price indices[1] for the domestic sector



(1) Prices deflated using GDP (market prices) deflator
Source: Office for National Statistics.

- Between 1996 and 2006, annual average domestic prices in real terms including VAT fell by 1% for electricity and rose by 16% for coal and smokeless fuels, 31% for gas, and 69% for heating oils.
- Between 2005 and 2006, domestic electricity prices increased by 19% in real terms, while gas increased by 29%. Coal and smokeless fuels rose by 5%, and heating oils by 11%.

4.5 Fuel expenditure as percentage of total expenditure by income group[1]



- The proportion of expenditure on fuel has changed between 1970 and 2005/06 for both the lowest and highest income groups. Whilst there has been an overall reduction in the proportion spent by both groups, a significant difference still exists. The proportion of expenditure spent on fuel dropped most significantly for the lowest income group over the period 1990 to 2003/04 with most of this fall having taken place since 1995/96. There was a slight rise between 2004/05 and 2005/06.

(1) Income groups are defined in terms of weekly income, in pounds, as follows:

	low	high
1970	<10	>80
1980	<40	>350
1990	<80	>800
2000/01	<107	>993
2001/02	<115	>1,085
2002/03	<123	>1,085
2003/04	<124	>1,092
2004/05	<132	>1,184
2005/06	<135	>1,224

Source: Office for National Statistics

TECHNICAL NOTES

1 Two technical measures, the Shannon-Wiener measure of diversity and the Herfindahl-Hirschman measure of concentration, are used in Energy Sector Indicators 2007.

Shannon-Wiener

2 The Shannon-Wiener measure of diversity has been chosen because it places weight on the contributions of smaller participants in various fuel markets as they provide the options for future fuel switching. This is done by multiplying the market share by the natural log of the market share, which diminishes the impact of larger participants. However, it is recognised that there are shortcomings in using only one indicator to represent a concept as complicated as diversity.

3 It is expressed by the following equation:

Shannon-Wiener measure = The market share multiplied by the natural log of the market share for each fuel in the market summed together

In mathematical terms, that is:

Shannon-Wiener measure = $-\sum_i \rho_i \ln(\rho_i)$

where ρ_i represents the proportion of the total supplied by fuel i.

The minimum value that the Shannon-Wiener measure can produce is zero which occurs when only one fuel is available for use. In this case, there would be no diversity of supply.

4 The Shannon-Wiener measure of diversity can be used to see how diversity of a particular market is changing over time. It should not be used to compare different markets with each other.

5 Seven fuels have been used to calculate the Shannon-Wiener measure of diversity for primary energy supply. If each fuel making up our energy supply provided an equal proportion, the value of the coefficient would be 1.95 showing total equality, the largest possible value for the Shannon-Wiener measure in this case. For electricity generation six fuels have been used, the largest possible value for the Shannon-Wiener measure in this case is 1.79, whilst for the international comparisons five fuels are used with the maximum value being 1.61.

Herfindahl-Hirschman (used only in the Background Indicators)

6 The Herfindahl-Hirschman measure attempts to measure market concentration. It places extra emphasis on the contributions of participants with the largest shares. The

measure is commonly used to assess whether mergers should go ahead and whether they will significantly affect the balance of the market in a particular sector.

7 It is expressed by the following equation:

Herfindahl-Hirschman measure = The square of each participant's market share added together across all participants in the market

Values vary between zero, which signifies a perfectly competitive industry, and ten thousand, for a pure monopoly.

8 The Herfindahl-Hirschman measure of concentration in 2006 was calculated assuming 30 generating companies, 10 to 22 electricity supply companies, depending on the sector, and 8 to 13 gas supply companies, again depending on the sector.

Fuel poverty

9 In November 2001 the Government published its Fuel Poverty Strategy. The Strategy sets out the approach of the Government and the Devolved Administrations to tackling fuel poverty in the UK. The aim of ending the problem of fuel poverty in vulnerable households by 2010 was restated in the Energy White Paper. The Strategy detailed a range of programmes and measures that had been put in place to address the main causes of fuel poverty, and said that the Government would report on progress annually. To monitor progress the annual reports would include information on the number of households, and the factors that affect fuel poverty (income, fuel prices and housing conditions). The strategy also set out a range of indicators that could be used to monitor progress towards the Government's target, and, accordingly these are also updated annually.

10 The Government's Fourth Annual Progress Report on the UK Fuel Poverty Strategy was published in June 2006 and includes statistics for the number of fuel poor households in 2004. It is accompanied by an internet-only series of annexes, including a detailed analysis of the profile of the fuel poor and an update of the nineteen Fuel Poverty Indicators as developed by the Fuel Poverty Monitoring and Technical Group. The web reference for all documents is:
www.dti.gov.uk/energy/fuel-poverty/strategy/index.html .
The next annual progress report will be published in June 2007.

Energy Efficiency Indicators

11 Traditionally, energy intensity (e.g. energy consumption per household, or per unit of economic output in business) has been used as a proxy for an energy efficiency indicator. However, intensity changes include changes in energy service demand (e.g. level of household comfort or hot water use) or to structural changes in Business (at sub-sectoral and product levels). Specific Energy Consumption (SEC) is defined as the change in the energy required to produce a constant level of energy service (in households) or unchanged unit of physical product in Business (at a suitably

disaggregated level). SEC is therefore a better indicator of energy efficiency changes than energy intensity. It is important to remember that SEC falls as it improves whereas efficiency rises – but the rates of change are equivalent. An overall SEC indicator for a sector is obtained by combining sub-indicators for individual services or sub-sectors, using energy consumption as the weighting factors.

12 In the chart 1.10, service demand and consumption – both dominated by space heating – show considerable fluctuations about the trend because of variations in the weather from year to year, whereas the SEC – dominated by cumulative insulation levels and boiler efficiencies – behaves much more steadily.

ESTIMATED DATA

13 Where feasible, charts have been updated to the latest possible year using provisional monthly data. Final energy data for 2006 are to be published in the DTI's Digest of UK Energy Statistics, 2007 on 26 July 2007.
www.dti.gov.uk/energy/statistics/publications/dukes/page29812.html

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