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## UK ENERGY IN BRIEF JULY 2005



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## UK ENERGY IN BRIEF JULY 2005

This booklet summarises the latest statistics on energy production, consumption and prices in the United Kingdom. Figures are taken from the 2005 edition of the “Digest of UK Energy Statistics”, published on 28 July 2005. Details of the Digest and other DTI energy publications can be found on page 36 of this booklet and are available on the Internet (<http://www.dti.gov.uk/energy/inform>). This booklet is also available on the Internet at:  
[http://www.dti.gov.uk/energy/inform/energy\\_in\\_brief/](http://www.dti.gov.uk/energy/inform/energy_in_brief/).



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# INTRODUCTION

The first four charts in this booklet are the four key indicators that are being 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<sub>2</sub> 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 further supporting and background indicators are published in UK Energy Sector Indicators 2005, available on the DTI website at:

[http://www.dti.gov.uk/energy/inform/energy\\_indicators/index.shtml](http://www.dti.gov.uk/energy/inform/energy_indicators/index.shtml) and in hard copy from DTI Publications Orderline:

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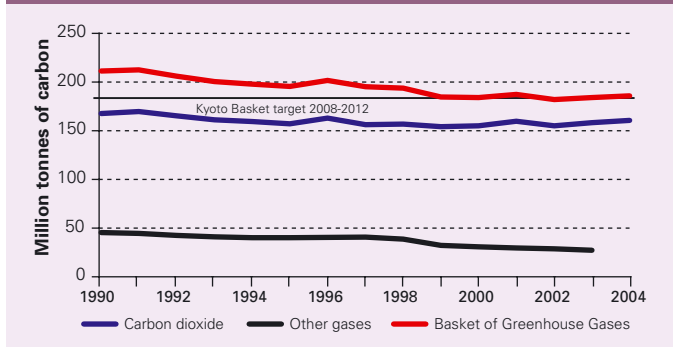
The next four charts put the total energy industry in an economic context. The charts show that the impact of the energy sector on the total economy has declined since 1980. Pages on overall energy production and consumption are followed by pages showing trends in production and consumption of each of the major fuels. Developments in Combined Heat and Power and renewable energy are also covered. These are followed by pages on energy prices, energy expenditure and energy efficiency.

The detailed background data can be found in the Digest of UK Energy Statistics 2005 available from The Stationery Office at £39 but also available free of charge on the DTI energy website

<http://www.dti.gov.uk/energy/inform/dukes/index.shtml>

# KEY INDICATORS

## 1. Low carbon – greenhouse gas and carbon dioxide emissions, 1990 to 2004



Source: Department for Environment, Food and Rural Affairs

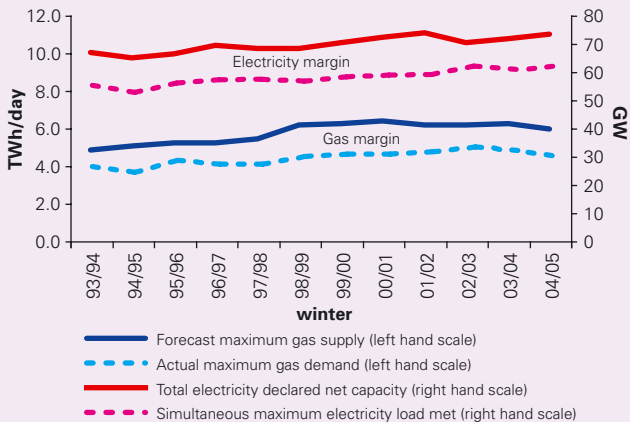
	Million tonnes of carbon					
	1990	1995	2000	2002	2003	2004(p)
Carbon dioxide	165.4	154.7	152.8	152.7	156.1	158.4
Methane	21.1	18.0	13.6	12.3	11.1	..
Nitrous oxide	18.5	15.6	12.2	11.2	11.0	..
HFC	3.1	4.2	2.5	2.8	2.9	..
PFC	0.4	0.1	0.1	0.1	0.1	..
SF <sub>6</sub>	0.3	0.4	0.5	0.4	0.4	..
<b>'Basket' of greenhouse gases</b>	<b>208.8</b>	<b>192.9</b>	<b>181.8</b>	<b>179.5</b>	<b>181.6</b>	<b>183.3</b>

Source: Department for Environment, Food and Rural Affairs; DTI (2004 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 13% between 1990 and 2003, 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 2003. Estimates based on energy production and consumption in 2004 indicate that emissions rose by 1.5% during 2004, thus the total change from 1990 is a fall of 4.2%.

## KEY INDICATORS

### 2. Reliability – gas and electricity capacity margins – maximum supply and maximum demand 1993/4 to 2004/5



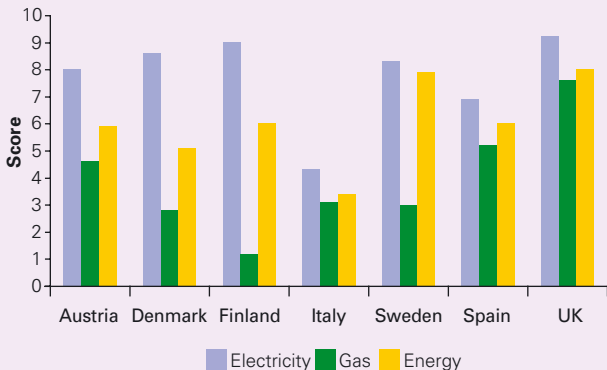
Source: National Grid Transco and DTI

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

In response to NGT's forecasts last summer of lower levels of electricity capacity, prices rose and generators brought previously mothballed plant back into service. As a result, plant margins for England and Wales rose from around 16% to over 20% for the winter period.

# KEY INDICATORS

## 3. Competitiveness – overall competitiveness score for selected EU energy markets (using provisional 2003 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. The report sets out the methodology in more detail, and can be found at:

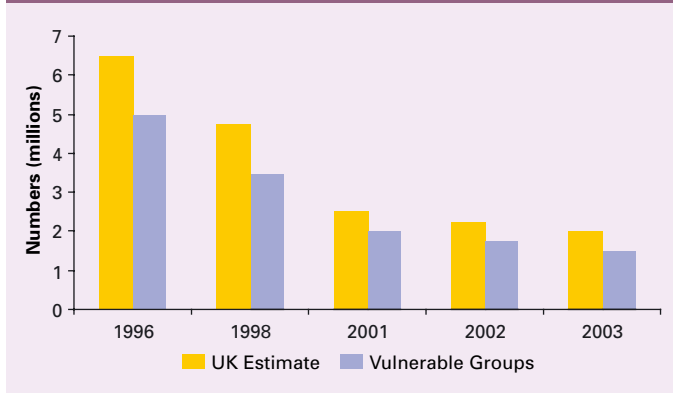
[http://www.dti.gov.uk/energy/gas\\_and\\_electricity/competitiveness\\_structure/oxera\\_report.pdf](http://www.dti.gov.uk/energy/gas_and_electricity/competitiveness_structure/oxera_report.pdf).

In 2003, 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 two previous years.



# KEY INDICATORS

## 4. Fuel poverty – number of UK households in fuel poverty<sup>(1)</sup>



Source: Various<sup>2</sup>

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

(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 Family Expenditure Survey.

(3) The tables show 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

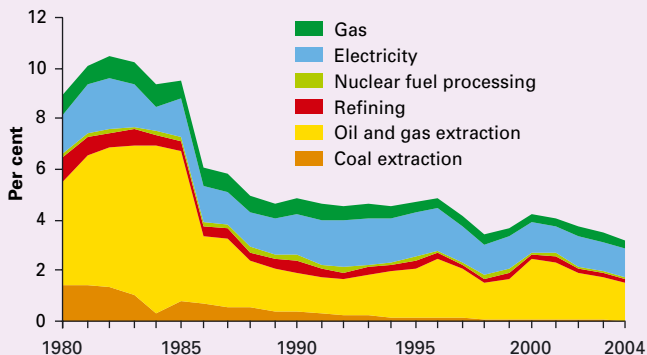
The number of households in fuel poverty has been reducing since 1996, as has the number of vulnerable fuel poor. In broad terms it is estimated that the number of fuel poor households in the UK has fallen from about 6½ million in 1996 to about 2 million in 2003. The number of vulnerable fuel poor is estimated to have fallen from about 5 million to about 1½ million in the same period.

# ENERGY IN THE ECONOMY

## THE ENERGY INDUSTRIES' CONTRIBUTION TO THE UK ECONOMY

- 3.2% of GDP
- 5.8% of total investment
- 38.1% of industrial investment
- 3% of annual business expenditure on research and development
- 148,900 people directly employed in 2004 (4% of industrial employment) and more indirectly eg an estimated 260,000 in support of UK Continental Shelf production
- Trade surplus in fuels of £1.3 billion in 2004

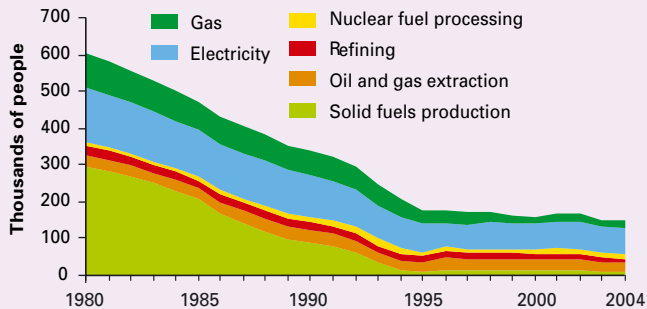
## Contribution to GDP by the energy industries, 1980 to 2004



Source: Office for National Statistics

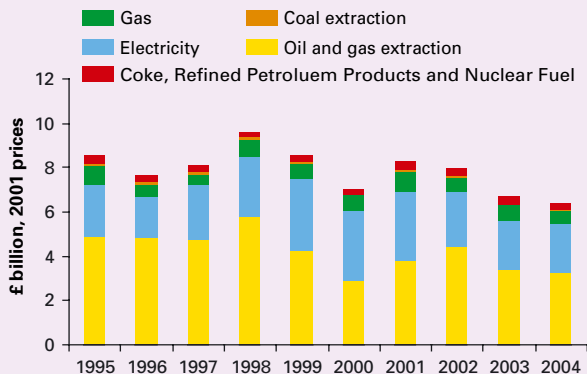
# ENERGY IN THE ECONOMY

## Trends in employment in the energy industries, 1980 to 2004



Source: Office for National Statistics

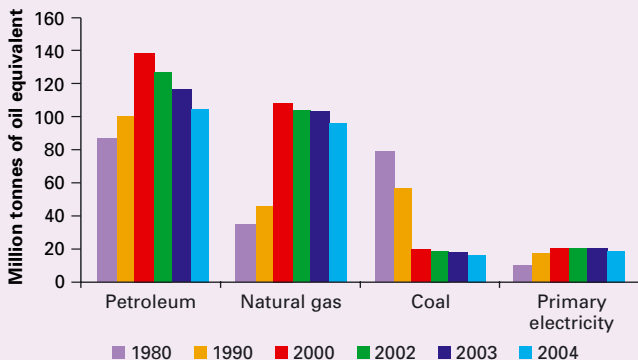
## Investment in the energy industries, 1995 to 2004



Source: Office for National Statistics

# OVERALL ENERGY

## Production of primary fuels, 1980 to 2004



### Million tonnes of oil equivalent

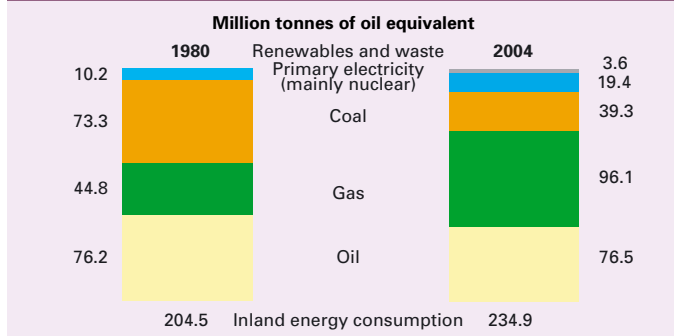
	1980	1990	2000	2002	2003	2004
Petroleum	86.9	100.1	138.3	127.0	116.2	104.5
Natural gas	34.8	45.5	108.4	103.6	102.9	96.0
Coal	78.5	56.4	19.6	18.8	17.6	15.7
Primary electricity	10.2	16.7	20.2	20.6	20.4	18.9
<b>Total</b>	<b>210.5</b>	<b>219.4</b>	<b>288.7</b>	<b>272.9</b>	<b>260.3</b>	<b>238.5</b>

Total production of primary fuels, when expressed in terms of their energy content, fell by 8.4% in 2004 compared to 2003. Petroleum accounts for 44% of total production, natural gas 40%, coal 7% and primary electricity (nuclear and natural flow hydro) 8%. Renewables and waste (not shown) account for the remaining 3.6 million tonnes of oil equivalent.

Total production has risen by 13% since 1980, primarily due to the growth of oil and gas. Production in 2000 was at record levels for natural gas, whilst in 1999 it was at record levels for overall energy and petroleum.

# OVERALL ENERGY

## Inland energy consumption, 1980 to 2004



	Million tonnes of oil equivalent					
	1980	1990	2000	2002	2003	2004
Conversion losses	62.1	66.4	53.9	52.5	53.7	53.5
Distribution losses and energy industry use			20.8	20.7	20.2	20.2
Final consumption						
Industry	48.3	38.7	34.6	33.7	34.2	34.1
Domestic sector	39.8	40.8	46.9	47.9	48.3	48.7
Transport	35.5	48.6	55.3	55.4	56.0	57.4
Services <sup>1</sup>	18.7	19.2	21.5	19.9	19.8	20.8
<b>Total final energy consumption</b>	<b>142.4</b>	<b>147.3</b>	<b>158.3</b>	<b>156.9</b>	<b>158.4</b>	<b>161.0</b>
<b>Total inland primary energy consumption<sup>2</sup></b>	<b>204.5</b>	<b>213.7</b>	<b>233.0</b>	<b>230.3</b>	<b>232.5</b>	<b>234.9</b>
<i>Temperature corrected total</i>	<i>206.2</i>	<i>221.6</i>	<i>237.9</i>	<i>236.0</i>	<i>236.3</i>	<i>238.2</i>

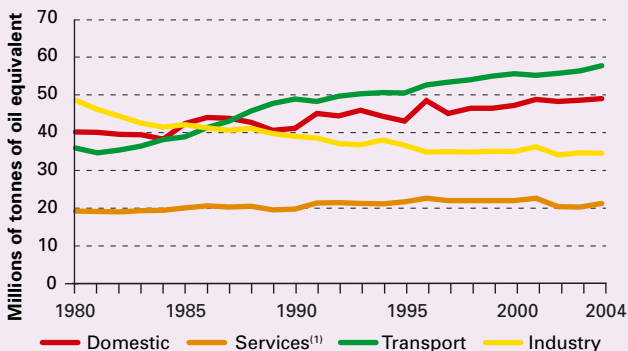
(1) Includes agriculture

(2) Excludes non-energy use

Primary energy consumption was 1.0% higher in 2004 than 2003. 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 31% of inland energy consumption in 2004.

# OVERALL ENERGY

## Final energy consumption, 1980 to 2004



2004

Million tonnes of oil equivalent

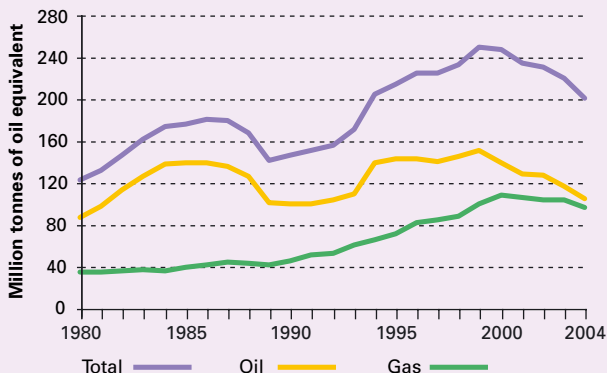
	Industry	Domestic	Transport	Services <sup>1</sup>	Total
Coal & manufactured fuels	1.7	1.3	-	0.1	3.1
Gas	12.5	34.1	-	9.5	56.1
Oil	8.3	3.1	56.8	1.6	69.8
Electricity	10.1	9.9	0.7	8.5	29.2
Renewables and heat	1.5	0.3	-	1.1	2.9
<b>Total</b>	<b>34.1</b>	<b>48.7</b>	<b>57.4</b>	<b>20.8</b>	<b>161.1</b>

(1) Includes agriculture

Final energy consumption (excluding non-energy use) was 1.6% higher in 2004 than in 2003. Since 1980 energy consumption by individual sectors has changed substantially: there have been rises of 62% for transport, 22% for the domestic sector and 11% for the service sector, whilst consumption by industry has fallen by 29%. The rate of increase in transport has slowed in recent years.

# OIL AND GAS PRODUCTION

## UK Continental Shelf production, 1980 to 2004



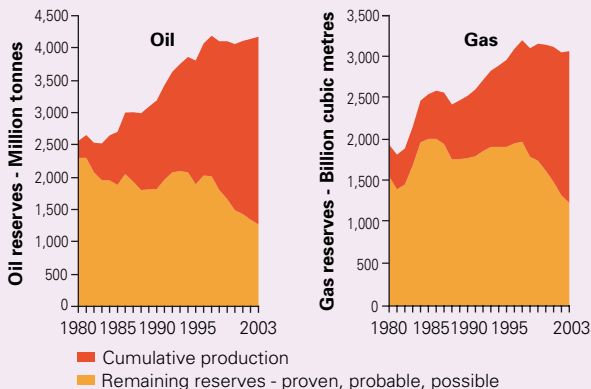
### Million tonnes of oil equivalent

	1980	1990	2000	2002	2003	2004
Oil	86.9	100.1	138.3	127.0	116.2	104.6
Gas	34.8	45.5	108.4	103.6	102.9	96.0
<b>Total</b>	<b>121.7</b>	<b>145.6</b>	<b>246.7</b>	<b>230.6</b>	<b>219.1</b>	<b>200.6</b>

Oil production in 2004 was 30% lower than the record level seen in 1999 and 10% lower than in 2003. Six new fields started production in 2004, but production from these fields was insufficient to make up the general decline in production from older established fields. Gas production in 2004 was 7% lower than in 2003. As with oil, UK gas production is also declining as UK Continental Shelf reserves deplete.

# OIL AND GAS PRODUCTION

## Remaining oil and gas reserves



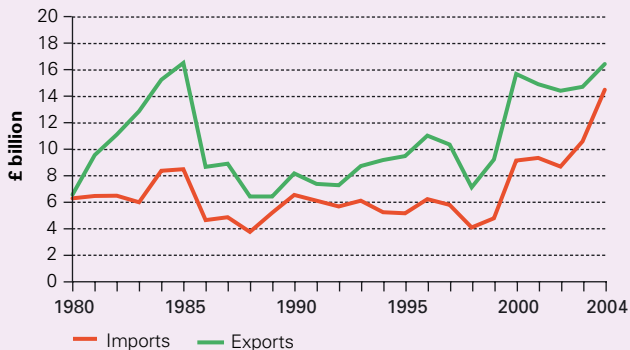
	1980	1990	2000	2002	2003
<b>Oil</b>	<b>Million tonnes</b>				
Cumulative production	263	1,374	2,570	2,799	2,910
Estimate of remaining reserves in present discoveries	2,300	1,815	1,490	1,345	1,267
<b>Total reserves in present discoveries</b>	<b>2,565</b>	<b>3,190</b>	<b>4,060</b>	<b>4,145</b>	<b>4,175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

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 and new technology allowing exploitation of discoveries being made and new technology allowing exploitation of discoveries that were previously regarded as not viable.



# PETROLEUM

## Foreign trade in crude oil and petroleum products, 1980 to 2004



### Crude oil and petroleum products

£ billion

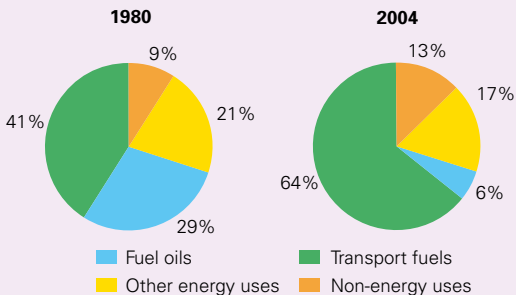
	1980	1990	2000	2002	2003	2004
Exports	6.5	8.1	15.6	14.3	14.6	16.3
Imports	6.2	6.4	9.0	8.6	10.5	14.4
<b>Net exports</b>	<b>0.3</b>	<b>1.6</b>	<b>6.5</b>	<b>5.7</b>	<b>4.1</b>	<b>2.0</b>

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. The 'surplus' fell from this peak due to lower prices but, with recent higher prices, has increased from £1.6 billion in 1990 to £2.0 billion in 2004, despite a decline in crude oil production.

# PETROLEUM

## Demand by product, 1980 to 2004



	Million tonnes					
	1980	1990	2000	2002	2003	2004
<b>Energy uses<sup>1</sup></b>						
Petrol	19.2	24.3	21.6	20.8	19.9	19.5
DERV fuel	5.9	10.7	15.6	16.9	17.7	18.5
Aviation turbine fuel	4.7	6.6	10.7	10.5	10.8	11.8
Burning oil	2.1	2.1	3.8	3.5	3.5	4.0
Gas oil	11.6	8.0	6.6	6.0	6.4	6.1
Fuel oils	22.7	14.0	3.4	4.1	4.4	4.7
Other	4.3	4.9	5.5	4.9	4.6	5.0
<b>Total energy uses</b>	<b>770.5</b>	<b>70.6</b>	<b>67.2</b>	<b>66.7</b>	<b>67.3</b>	<b>69.6</b>
Of which:						
Transport fuels	31.9	43.5	49.8	49.3	50.0	51.3
<b>Non-energy uses</b>	<b>7.0</b>	<b>9.2</b>	<b>10.1</b>	<b>9.6</b>	<b>10.5</b>	<b>10.6</b>
<b>Total deliveries</b>	<b>77.5</b>	<b>79.8</b>	<b>77.3</b>	<b>76.2</b>	<b>77.8</b>	<b>80.2</b>

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

In 2004 transport fuels increased their share of overall oil demand which was due to increases in consumption for air and road transport. Deliveries of motor spirit decreased but this was 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 2004 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 2003.

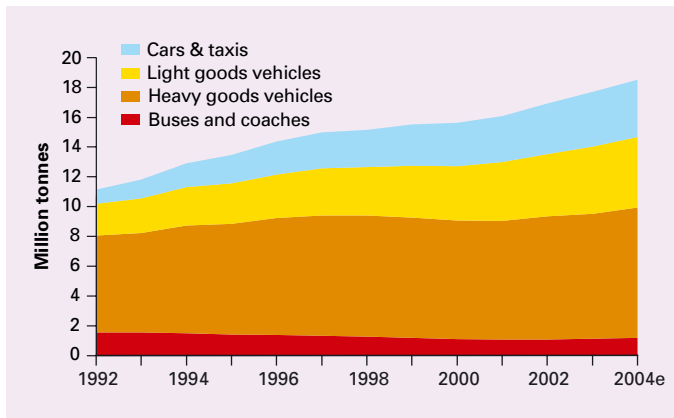
# PETROLEUM

## Leaded/unleaded petrol; indicative demand for DERV fuel

### Petrol

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
% unleaded	57.6	63.0	68.0	71.9	78.6	87.6	93.0	95.8	98.0	99.0	99.5

### DERV fuel



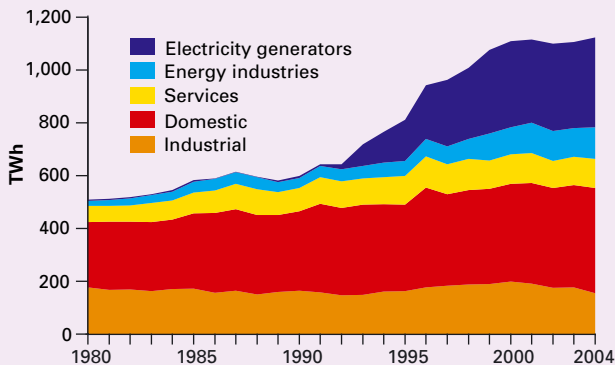
### DERV fuel demand

	Thousand tonnes					
	1990	1995	2000	2002	2003	2004
Cars & taxis	917	1,909	2,921	3,418	3,688	3,858 <small>estimated</small>
Light goods vehicles	1,653	2,703	3,650	4,163	4,511	4,716 <small>estimated</small>
Heavy goods vehicles	7,034	7,437	7,971	8,276	8,393	8,773 <small>estimated</small>
Buses & coaches	1,048	1,411	1,090	1,071	1,120	1,171 <small>estimated</small>
<b>Total</b>	<b>10,652</b>	<b>13,457</b>	<b>15,632</b>	<b>16,927</b>	<b>17,712</b>	<b>18,514</b>

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 2004 have been estimated using the 2003 ratios. Since 1990, demand for DERV fuel has increased largely for use in cars supplanting petrol (see p18). Effectively all petrol sold in the UK is now lead-free since Lead Replacement Petrol (the alternative to 4-star Leaded Petrol introduced in 2000) is itself lead-free.

# NATURAL GAS

Natural gas consumption, 1970 to 2004

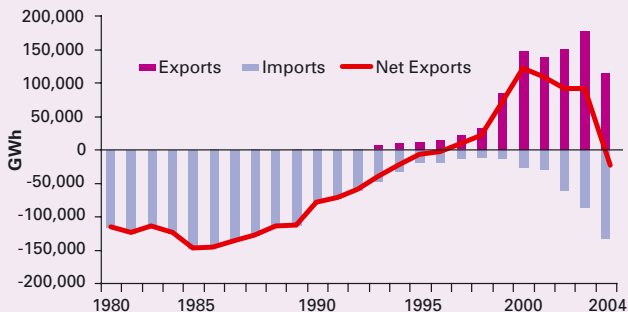


	1980	1990	2000	2002	2003	2004
Electricity generators	4.0	6.5	324.6	329.8	324.6	338.7
Energy Industries	19.1	39.2	102.1	113.0	108.6	118.6
Industry	177.5	164.6	198.5	176.2	177.1	156.0
Domestic	246.8	300.4	369.9	376.4	386.5	396.4
Services	60.4	86.4	110.5	100.8	106.0	110.1
<b>Total</b>	<b>507.8</b>	<b>597.0</b>	<b>1,105.5</b>	<b>1,096.3</b>	<b>1,102.7</b>	<b>1,119.8</b>

In the early 1970s, following the advent of natural gas, gas consumption grew rapidly. Industrial consumption peaked 2000 and has fallen since then by around 20%. Over the last 20 years domestic consumption has grown by 30% and services consumption by 42%. However, since 1991 the growth in gas consumption has been dominated by its increasing use in electricity generation, which now accounts for 30% of all natural gas consumption.

# NATURAL GAS

## UK Trade in natural gas 1980 to 2004

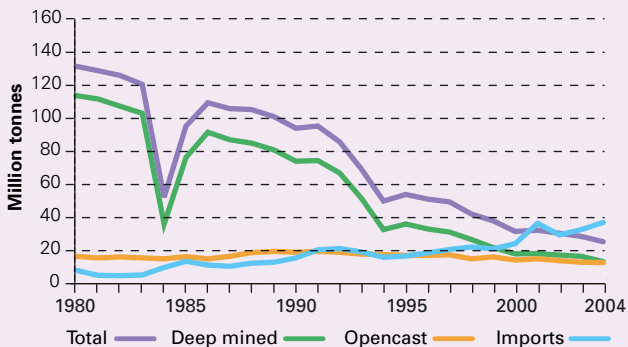


	TWh					
	1980	1990	2001	2002	2003	2004
Natural gas production	404.8	528,843	1,231,263	1,204,505	1,197.1	1,116.6
Imports	116,291	79,833	30,464	60,493	86,298	133,035
Exports	-	-	138,330	150,731	177,039	114,111
Net imports (-) or exports (+)	-116,291	-79,833	107,866	90,238	90,741	-18,924

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 and net exports reached their peak in 2003. In 2004, with the decline in UK natural gas production, exports of gas fell by 35 per cent compared with 2003 and imports increased by 54 per cent and the UK became a net importer of gas once again.

# COAL

## Coal production and imports, 1970 to 2004

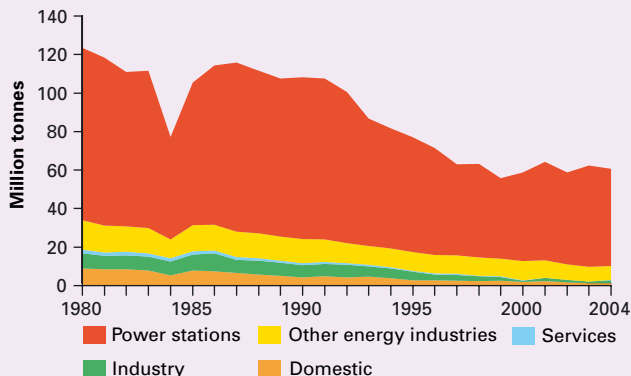


	Million tonnes					
	1980	1990	2000	2002	2003	2004
Deep mined	112.4	72.9	17.2	16.4	15.6	12.5
Opencast	15.8	18.1	13.4	13.1	12.1	12.0
<b>Total (including slurry)</b>	<b>130.1</b>	<b>92.8</b>	<b>31.2</b>	<b>30.0</b>	<b>28.3</b>	<b>25.1</b>
Coal imports	7.3	14.8	23.4	28.7	31.9	36.2

Coal production was 11% lower in 2004 than in 2003; deep mined production fell by 20%, while opencast production fell by 1%. Coal production in 2004 was less than a fifth of the level in 1980 and around a quarter of the level in 1990. 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. Although there was a decrease in imports in 2002, the level imports went above the level of production again in 2003 and in 2004 imports reached a new record of 36 million tonnes.

# COAL

## Coal consumption, 1970 to 2004

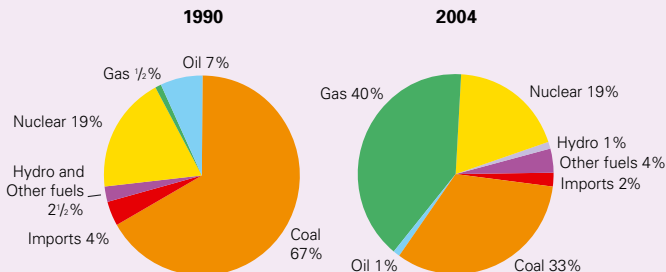


	Million tonnes					
	1980	1990	2000	2002	2003	2004
Power stations	89.6	84.0	46.2	47.7	52.5	50.5
Domestic	8.9	4.2	1.9	1.8	1.2	1.4
Industry	7.9	6.3	0.7	1.1	0.9	1.5
Services	1.8	1.2	0.1	<0.1	<0.1	<0.1
Other energy industries	15.3	12.5	10.0	8.0	7.6	7.3
<b>Total consumption</b>	<b>123.5</b>	<b>108.3</b>	<b>58.9</b>	<b>58.7</b>	<b>62.3</b>	<b>60.8</b>

The proportion of coal consumed by power stations has increased steadily since the 1970s, reaching a level of 84% in 2003 but in 2004 it fell marginally to 83%. The decline in coal consumption at power stations has halted in recent years, and remained above 50 million tonnes in 2004. 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. Following a small increase in coal consumption between 1999 and 2001, 2002 saw a 9% decrease from the previous year. There was a partial recovery in 2003 as consumption rose again by 6%. However, in 2004 consumption fell slightly by 2½%.

# ELECTRICITY

## Electricity available by fuel type, 1980 to 2004



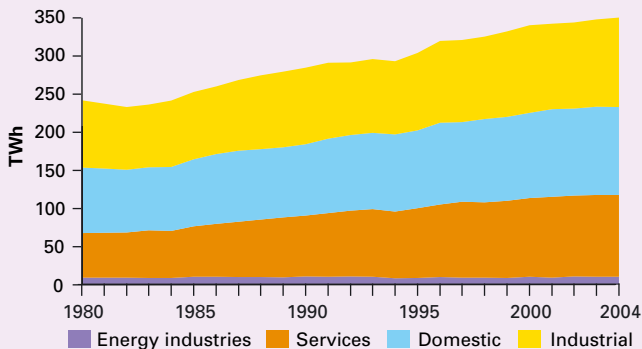
	1980	1990	2000	2002	2003	2004
Coal	190.0	208.0	114.7	118.5	131.7	126.6
Oil	33.9	21.1	5.9	4.2	4.1	4.3
Gas	1.6	1.6	145.0	148.9	145.1	152.8
Nuclear	32.3	58.7	78.3	81.1	81.9	73.7
Hydro	7.3	7.9	4.2	3.9	2.3	4.2
Other fuels			9.2	10.2	11.5	13.6
Net Imports	-	11.9	14.2	8.4	2.2	7.5
<b>Total</b>	<b>265.1</b>	<b>309.4</b>	<b>371.5</b>	<b>375.1</b>	<b>378.9</b>	<b>382.7</b>

The mix of fuels used to generate electricity continues to evolve. Since 1990, the use of all fuels in electricity generation has fallen, except for gas, which has risen markedly over this period from 1.6 to 153 TWh. Net import levels averaged over 16 TWh in the mid 1990s. In 2004 imports recovered from an unusually low level in 2003. This was mainly because in 2003 lower prices made the UK less attractive to French exporters while higher prices in Continental Europe fostered growth in UK exports. Since 2000 coal has been called upon to make up for unavailable nuclear and gas fired stations and then as a substitute for high gas priced gas. However, gas continues to retain the largest share of the market (40%) while coal's share of the market has fallen from two thirds in 1980 to a third in 2004. Nuclear's share peaked at 26% in 1997 but in 2004 it was only 19%.



# ELECTRICITY

Electricity consumption, 1970 to 2004

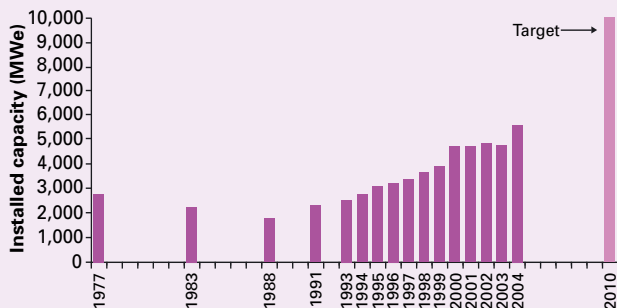


	1980	1990	2000	2002	2003	TWh 2004
Industrial	88.6	100.6	115.3	113.3	115.0	117.8
Domestic	86.1	93.8	111.8	114.5	115.8	115.5
Services	58.4	80.0	103.5	106.2	107.4	107.4
Energy industries	8.5	10.0	9.7	10.1	9.9	9.7
<b>Total</b>	<b>241.6</b>	<b>284.4</b>	<b>340.3</b>	<b>344.1</b>	<b>348.0</b>	<b>350.4</b>

Over the last 5 years electricity consumption in the domestic and services sectors has grown by 3% and 4% respectively. Industrial consumption varies with business activity: it rose every year between 1994 and 2000, fell back by 2½% in 2001 but in 2003 it climbed back to the 2000 level and continue to grow in 2004.

# COMBINED HEAT AND POWER

Combined heat and power, 1977-2004

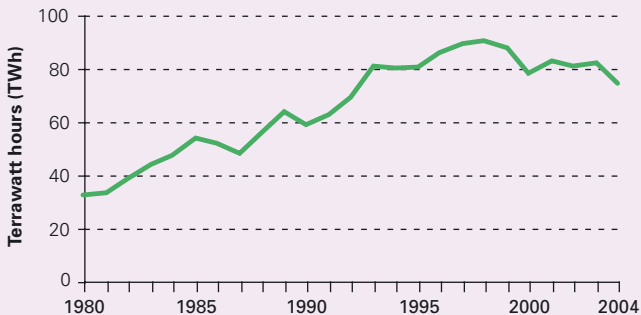


	1995	2000	2002	2003	2004
CHP electrical capacity (MWe)	3,094	4,730	4,848	4,777	5,606
CHP electrical generation (GWh)	14,468	26,539	24,420	24,916	27,354
CHP heat generation (GWh)	57,401	62,121	59,721	60,052	62,065
Number of CHP sites					
Less than 100 kWe	686	667	641	622	618
100 kWe to 999 kWe	411	593	637	648	665
1 MWe to 9.9 MWe	147	192	184	190	194
10 MWe and greater	64	70	72	74	75
<b>Total</b>	<b>1,308</b>	<b>1,522</b>	<b>1,534</b>	<b>1,534</b>	<b>1,552</b>

Electrical capacity and electrical generation increased in 2004 by 17% and 10% respectively. 40% 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 2004, 7% 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.

# NUCLEAR POWER

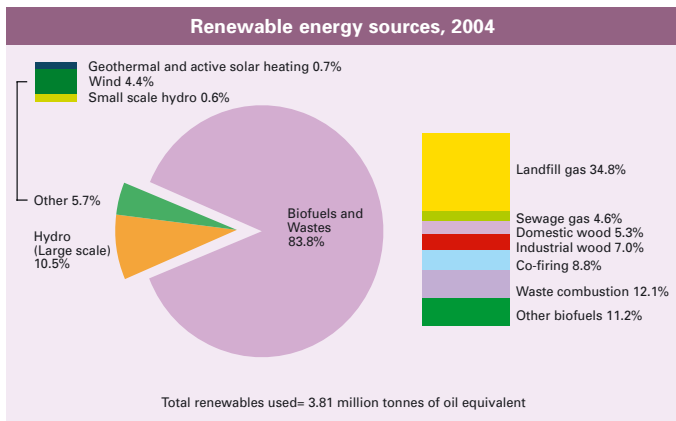
Gross electricity supplied by nuclear generation, 1970 to 2004



	1990	2000	2002	2003	2004
Electricity supplied (gross) (TWh)	59	78	81	82	74
% of electricity generation	21	22	22	22	19

During 2004 nuclear generators experienced unplanned outages due to emergency maintenance and safety concerns so electricity output was down 10% from the previous year. It represented just under a fifth of the total volume of electricity generated in the UK in 2004. Nuclear electricity output was 25% higher in 2004 than in 1990.

# RENEWABLES



## Total use of renewables

## Thousand tonnes of oil equivalent

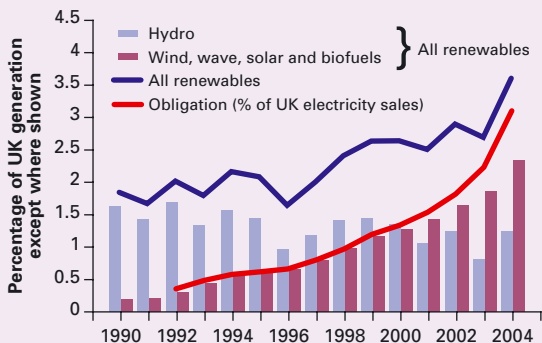
	1990	2000	2002	2003	2004
Geothermal and active solar heating	7.2	12.0	17.1	20.8	24.9
Wind and wave	0.8	81.3	108.0	110.5	166.4
Hydro (small and large-scale)	447.7	437.3	411.7	277.5	423.9
Landfill gas	79.8	731.1	892.1	1,088.1	1,326.7
Sewage gas	138.2	168.7	174.0	165.0	176.7
Wood (domestic and industrial)	174.1	502.8	469.8	469.8	469.8
Waste combustion	100.8	375.6	453.8	479.5	463.1
Other biofuels	71.9	216.1	439.8	614.1	762.0
<b>Total</b>	<b>1,020.5</b>	<b>2,524.9</b>	<b>2,966.3</b>	<b>3,225.4</b>	<b>3,814.3</b>

In 2004, biofuels accounted for 84% of renewable energy sources with most of the remainder coming from large-scale hydro, wind and other electricity production. Hydro accounted for 11% and wind power contributed 4½%.

Of the 3.81 million tonnes of oil equivalent of primary energy use accounted for by renewables, 3.14 million tonnes was used to generate electricity and 0.67 million tonnes to generate heat. Renewable energy use grew by 18% in 2004 and has more than tripled since 1990.

# RENEWABLES

## Growth in electricity generation from renewable sources since 1990



### Percentage of UK generation except where shown

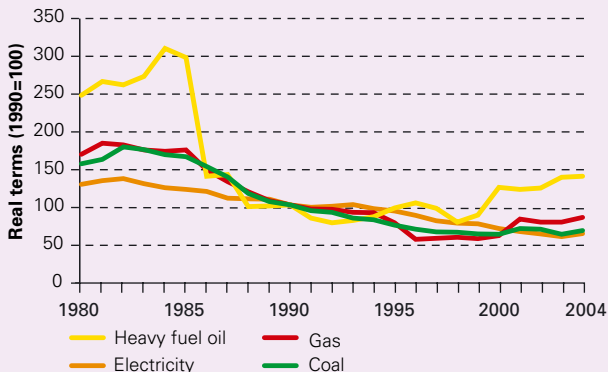
	1990	2000	2002	2003	2004
Wind, wave, solar and biofuels	0.19	1.27	1.64	1.86	2.33
Hydro	1.63	1.35	1.24	0.81	1.25
<b>Total Renewables</b>	<b>1.82</b>	<b>2.62</b>	<b>2.87</b>	<b>2.67</b>	<b>3.58</b>
Obligation (% of UK electricity sales)	-	1.32	1.80	2.21	3.08

Renewables accounted for 3.58% of electricity generated in the UK in 2004, up from 2.67 in 2003. Hydro recovered from unusually low levels in 2003, which were caused by decreased water flow from low rainfall.

Renewables accounted for 3.08% of UK electricity sales on a Renewables Obligation basis, up from 2.21% in 2003.

## PRICES

### Fuel price indices for the industrial sector, 1980 to 2004



#### Real prices, 1990 = 100

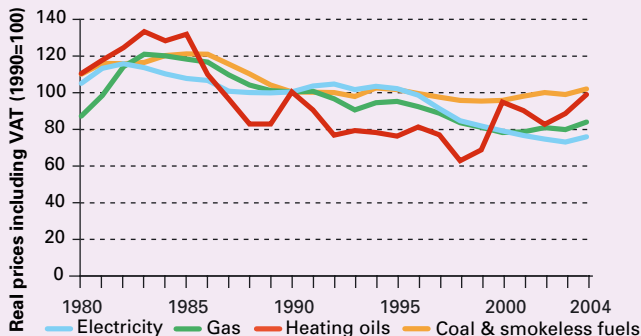
	1980	1990	2000	2002 <sup>1</sup>	2003 <sup>1</sup>	2004 <sup>1</sup>
Electricity	127.5	100	68.3	61.3	57.5	61.2
Gas	167.4	100	59.1	77.2	77.2	82.9
Heavy fuel oil	246.3	100	123.6	122.5	137.0	135.0
Coal	155.0	100	60.6	67.8	60.8	65.5
<b>Industrial prices</b>	<b>175.1</b>	<b>100</b>	<b>77.4</b>	<b>77.2</b>	<b>81.8</b>	<b>84.6</b>

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

Industrial electricity prices increased in 2004 by 6% in real terms, and were 36% lower than in 1994. Despite the increase in 2004, average industrial electricity prices continue to be at amongst their lowest levels in real terms since records began in 1970. Gas prices increased by 7% in 2004, but they were 7% lower than in 1994. Heavy fuel oil prices decreased by 1% in the year to 2004, and were 60% higher than in 1994.

## PRICES

### Fuel price indices for the domestic sector, 1980 to 2004



#### Real prices including VAT, 1990 = 100

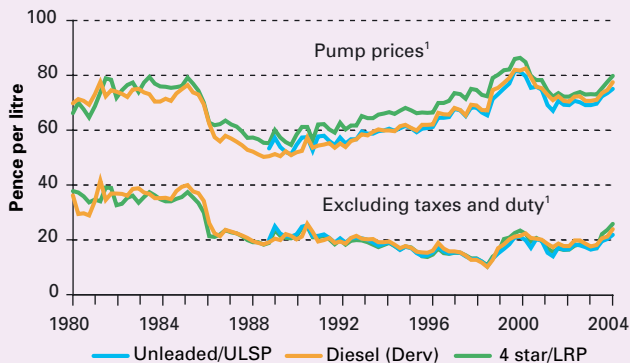
	1980	1990	2000	2002	2003	2004
Coal and smokeless fuels	109.7	100.0	95.4	99.6	98.6	101.5
Gas	86.7	100.0	77.8	80.5	79.4	83.4
Electricity	104.7	100.0	78.7	74.2	72.7	75.4
Heating oils	110.1	100.0	94.5	82.2	88.3	98.3
<b>Domestic prices (fuel &amp; light)</b>	<b>99.4</b>	<b>100.0</b>	<b>79.6</b>	<b>78.4</b>	<b>77.5</b>	<b>81.4</b>

Source: Retail Price Index, ONS

Total domestic energy prices in 2004 increased in real terms by 5%. Within the overall movement, electricity prices increased by 4%, gas increased by 5% and the price of coal and smokeless fuels increased by 3%. The largest increase over the period was for heating oils with an increase of 11%. Between 1994 and 2004, real prices have fallen by 27% and 11% respectively for electricity and gas, whilst the real price of heating oils has increased by 26%. Over the same period the price of coal and smokeless fuels has remained about the same in real terms.

# PRICES

## Petrol and diesel prices, 1980 to 2004



(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

The real terms price of Ultra Low Sulphur Petrol increased by 2% during 2004, whilst the price of Lead Replacement Petrol and diesel increased by 3% and 4% respectively. In cash terms, a litre of ULSP cost 4.2 pence more in 2004 than a year earlier, whilst LRP and diesel increased by 4.5 and 4.0 pence per litre respectively.



# EXPENDITURE

## Fuel expenditure of households<sup>1</sup>, 2003/04

	Income decile					All households
	Lowest	Third	Fifth	Eighth	Highest	
<b>Expenditure (£ per week)</b>						
Gas	3.2	4.6	5.3	6.0	7.9	5.2
Electricity	4.3	5.5	5.7	6.4	8.3	6.0
Other Fuels	0.4	0.5	0.6	0.8	1.2	0.7
Total fuel expenditure	7.9	10.6	11.6	13.2	17.4	12.0
<b>Total expenditure</b>	<b>139.6</b>	<b>224.2</b>	<b>361.7</b>	<b>557.2</b>	<b>905.0</b>	<b>418.1</b>

### Percentage of total expenditure

Gas	2.3	2.1	1.5	1.1	0.9	1.3
Electricity	3.1	2.4	1.6	1.1	0.9	1.4
Other Fuels	0.3	0.2	0.2	0.1	0.1	0.2
<b>Total fuel expenditure</b>	<b>5.7</b>	<b>4.7</b>	<b>3.2</b>	<b>2.4</b>	<b>1.9</b>	<b>2.9</b>

(1) includes non-consuming households

Source: Expenditure and Food Survey, ONS

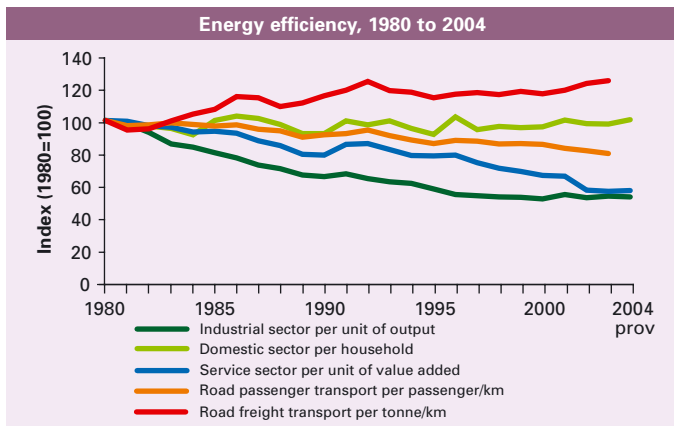
### Fuel purchases as a percentage of total household expenditure

	1980	1990	2000/01	2001/02	2002/03	2003/04
Gas	1.6	1.7	1.2	1.3	1.3	1.3
Electricity	2.7	2.3	1.6	1.5	1.4	1.4
Coal and Coke	0.9	0.3	0.3	0.2	0.2	0.2
Heating oil	0.4	0.2				
<b>Total</b>	<b>5.6</b>	<b>4.5</b>	<b>3.1</b>	<b>2.9</b>	<b>2.9</b>	<b>2.9</b>

Source: Expenditure and Food Survey, ONS

A household in the highest income decile (i.e. the 10% of households with the highest income) spent more than twice as much on fuel in 2003/04 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 twice that of the average household and 3 times as large compared to the highest earners. However, a general fall in energy prices (relative to other costs) has contributed to an overall reduction in the amount spent on fuel, falling from 5.6% of expenditure in 1980 to 2.9% in 2003/04.

# ENERGY EFFICIENCY



## Tonnes of oil equivalent

	1980	1990	2000	2002	2003	2004 prov
Industrial energy consumption per million units of GVA	362.8	236.6	186.1	188.9	192.4	191.0
Domestic energy consumption per household	2.0	1.8	1.9	1.9	1.9	2.0
Service sector energy consumption per million units of GVA	81.8	64.1	53.9	46.5	45.8	46.4
Road passenger energy consumption per million passenger-kilometres	45.7	41.6	38.9	37.1	36.3	..
Road freight energy consumption per million freight-kilometres	76.4	88.0	88.9	93.7	95.1	..

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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Natural gas production Petroleum production	Clive Evans 5189	<a href="mailto:Clive.Evans@dti.gsi.gov.uk">Clive.Evans@dti.gsi.gov.uk</a>
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Emissions of greenhouse gases Energy efficiency	Chris Michaels 2710	<a href="mailto:Chris.Michaels@dti.gsi.gov.uk">Chris.Michaels@dti.gsi.gov.uk</a>

In addition, there is a Textphone number that the deaf and hard of hearing can use to contact DTI: 020 7215 6740.

## 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: <b>Thousand toe</b>	<b>TJ</b>	<b>GWh</b>	<b>Million therms</b>
from: <b>Thousand toe</b>	1	41.868	11.630	0.39683
<b>TJ</b>	0.023885	1	0.27778	0.0094778
<b>GWh</b>	0.085985	3.6000	1	0.034121
<b>Million therms</b>	2.5200	105.51	29.307	1

*multiply by*

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.

## REFERENCES

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 2005 to March 2006) from the DTI, priced £35 for UK subscribers. Single copies available from DTI Publications Orderline priced £5. For further information call 020 7215 2698. It can also be accessed via DTI's energy website: [http://www.dti.gov.uk/energy/inform/energy\\_trends/index.shtml](http://www.dti.gov.uk/energy/inform/energy_trends/index.shtml), together with monthly tables, which can be found at:

[http://www.dti.gov.uk/energy/inform/energy\\_stats/index.shtml](http://www.dti.gov.uk/energy/inform/energy_stats/index.shtml).

**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. For further information call 020 7215 6532 or it can be accessed via DTI's energy website: [http://www.dti.gov.uk/energy/inform/energy\\_prices/index.shtml](http://www.dti.gov.uk/energy/inform/energy_prices/index.shtml).

**The Digest of UK Energy Statistics 2005** 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. It includes detailed information on the production and consumption of individual fuels and of energy as a whole. The 2005 edition was published by The Stationery Office on 28 July 2005 and costs £39. It can also be accessed via DTI's energy website: <http://www.dti.gov.uk/energy/inform/dukes/index.shtml>.

**Energy Sector Indicators 2005** was published on 20 July 2005 as a supplement to the Second 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. As well as the four key indicators used in the Report, and 28 supporting indicators there is the full range of background indicators that have been published in the corresponding booklet for earlier years. Energy Sector Indicators 2005 is available on the DTI web site at: [http://www.dti.gov.uk/energy/inform/energy\\_indicators/index.shtml](http://www.dti.gov.uk/energy/inform/energy_indicators/index.shtml) and in hard copy (free of charge) from DTI Publications Orderline: 0845 015 0010.

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>.

## REFERENCES

**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 booklet describes the 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, 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, while detailed tables can be found on the DTI web site.

[http://www.dti.gov.uk/energy/inform/energy\\_consumption/ecuk.pdf](http://www.dti.gov.uk/energy/inform/energy_consumption/ecuk.pdf)

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 web site at <http://www.dti.gov.uk/energy/whitepaper/index.shtml> and in hard copy from The Stationery Office.

The Second Annual Report, on the implementation of the White Paper published in July 2005, reviews progress over the last 12 months and the way ahead. It is available on the DTI web site: <http://www.dti.gov.uk/energy/sepn/secondannualreport.shtml>.

**Energy Projections for the UK: Energy Paper 68** presents the results of an exercise to update the Government's projections of future UK energy demand and related emissions of carbon and sulphur dioxides to 2020. It builds on work issued as a working paper in March 2000 and its projections underpin the Climate Change Programme launched by the DEFRA in November 2000. The paper contributes to policy development and assessment of the UK's efforts to meet its national and international greenhouse gases targets. Energy Paper 68, published 8 December 2000, is available from the Stationery Office priced £32.50. It can also be accessed via DTI's energy website: [http://www.dti.gov.uk/energy/inform/energy\\_projections/index.shtml](http://www.dti.gov.uk/energy/inform/energy_projections/index.shtml).

**Updated emissions projections** The results of further revisions to the emissions projects that have taken place since May 2004 were published on the DTI website on 11 November 2004. These results have helped to inform the final decision on the level of the overall UK emissions cap in October 2004 and the revisions to the April NAP. The results are presented as a paper in four parts. Part one provides a summary of the headline projection and main changes since the April NAP projection. Part two provides the sectoral projections. Part three provides energy demand results and part four provides detail on energy supply. The projections document is available at: <http://www.dti.gov.uk/energy/sepn/uep2004.pdf>

## REFERENCES

**The UK Fuel Poverty Strategy, 2nd Annual Progress Report 2005** 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/energy/consumers/fuel\\_poverty/](http://www.dti.gov.uk/energy/consumers/fuel_poverty/)

It is accompanied by detailed annexes published on the DTI web site at:

[http://www.dti.gov.uk/energy/consumers/fuel\\_poverty/](http://www.dti.gov.uk/energy/consumers/fuel_poverty/)

The **third** 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](mailto: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/](http://www.dti.gov.uk/energy/environment/energy_impact/).

The cover illustration used for UK Energy in Brief and other 2004-2005 DTI energy statistics publications is from a photograph by Peter Askew. It was a winning entry in the DTI News Photographic Competition in 2000.

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