



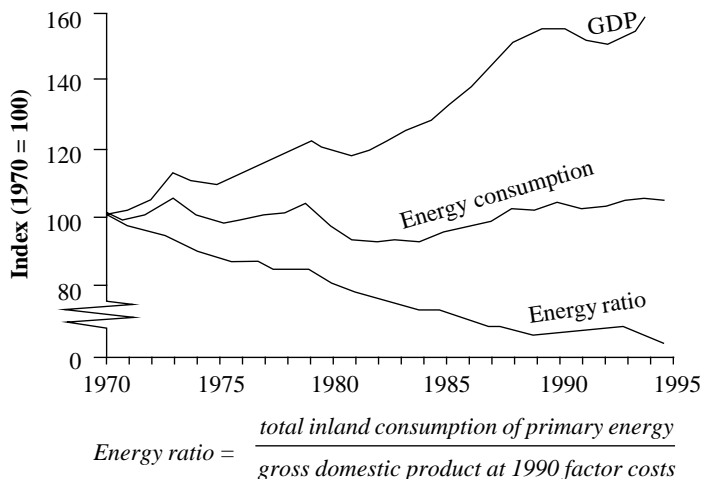
# Energy Policy in the UK

### Energy Consumption

Since 1970, the energy ratio (the ratio of primary energy use:GDP) has fallen (Fig 1). This means that energy intensity is decreasing and this is a result of:

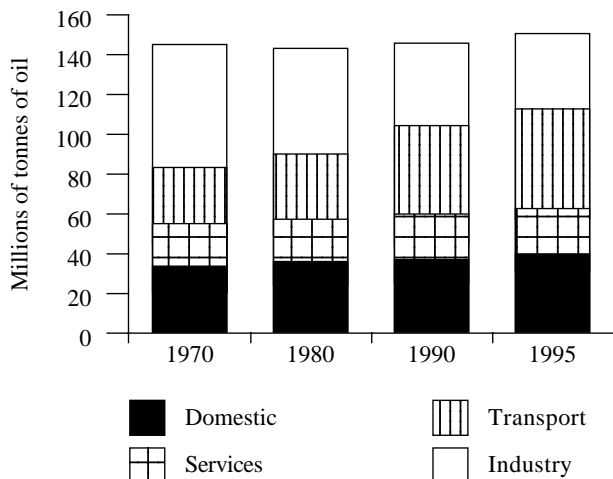
1. increasing energy prices;
2. increasing efficiency of use;
3. fuel switching;
4. movement of the economy away from energy intensive activities, eg. manufacturing;
5. the fact that some industrial uses, eg. space heating, do not increase in line with output.

**Fig 1. Trends in the energy ratio and its components, 1970-95**



As Fig 2 shows, industrial consumption of energy has fallen dramatically and there has been a corresponding increase in the use of oil for transport. This broadly reflects the decline in manufacturing and the increase in service and distribution sectors. Thus, electricity consumption by the service sector has increased by 130% between 1970 and 1995.

**Fig 2. Final energy consumption by sector, 1970 to 1995**

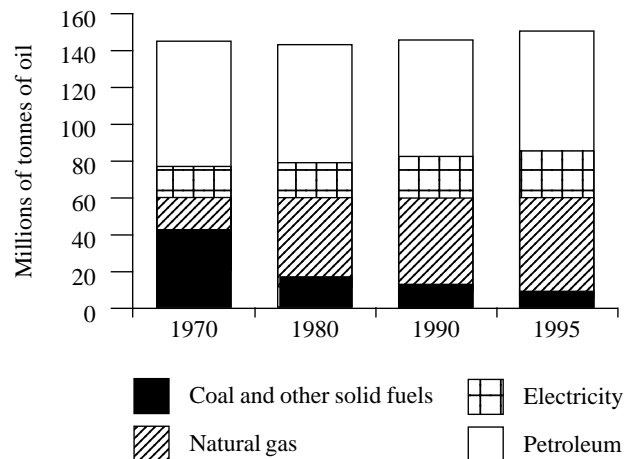


In formulating its energy policy, the government has predicted that:

1. Demand for road transport fuels will continue to increase (Fig 2). Note that transport is already the greatest user of energy.
2. Demand for electricity will rapidly increase. Despite energy efficiency increases, the development of new appliances is increasing and the number of new households is expected to increase by 25% over the next 20 years.
3. Energy efficiency will dramatically increase, stimulated by, for example, increasingly tough carbon taxes and the international agreement on carbon dioxide emissions.

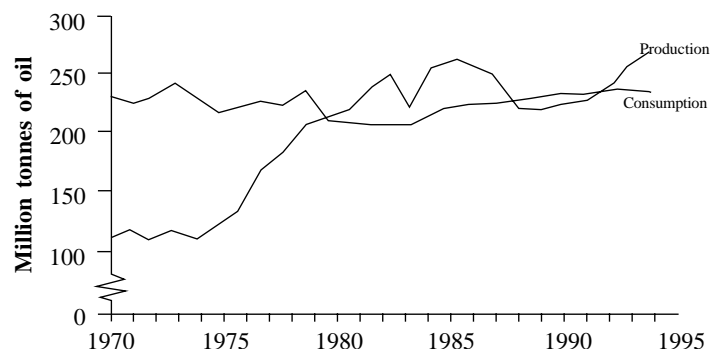
The way in which total energy consumption by fuel has changed over the last 25 years is shown in Fig 3.

**Fig 3. Final energy consumption by fuel, 1970 to 1995**



Before the development of North Sea oil and gas, UK consumption greatly exceeded production and the UK was dependent on imports (Fig 4). For nearly a decade after that, the UK was self-sufficient but temporary production losses at the end of the 1980s (due to the Piper Alpha accident) meant that the UK was a net importer again in 1993. Now, production exceeds consumption and government policy is to ensure that this pattern is maintained.

**Fig 4. UK primary energy production and consumption, 1970-95**



### Fossil Fuels

Both oil and gas production has increased over the last 25 years and the government is optimistic that new reserves will be discovered. Typically, the estimates of remaining resources in present discoveries have stayed the same over the last 10 years, despite the large increases in the amount of oil and gas extracted. Both oil and gas are cleaner (less sulphur) and easier and cheaper to transport than coal. Because of this, coal production and use has plummeted. Huge coal reserves have been left untouched; these may be economically exploitable in the future, if energy prices increase and exploitation technologies improve.

Gas is by far the cleanest of the fossil fuels and the cheapest to transport. Hence, with the development of **Combined Cycle Gas Turbines (CCGT)**, using gas from the Irish and North Sea, as well as that piped across the North Sea from Zebbrugge, it has quickly become the dominant fossil fuel. The development of gas fired power stations using CCGT technology has also helped the government avoid the expense of fitting **flue gas desulphurisation** equipment at many of the remaining coal fired power stations. The **1988 Large Combustion Plant Directive** stipulated that UK sulphur dioxide emissions be cut by 60%. In theory, this could have been achieved by:

- (i) Using coal with a lower sulphur content (expensive)
- (ii) Removing the sulphur from coal or from the chimney (flue) emissions.  
e.g. flue-gas desulphurisation (expensive)
- (iii) Burning less coal

Generally, the policy has been to adopt the latter strategy and this has accelerated the demise of coal and the dash for gas. Recently, because of concerns that the entire coal industry is being irreversibly weakened, the government has announced that it is suspending the development of any new gas-fired plants. Open-cast mining looks set to increase further, almost certainly at the expense of pit mining.

### Nuclear Power

As with most of its European counterparts, the UK Government has stated that no new nuclear generation of electricity will be developed. This reflects widespread public concern about the operating safety of the plants, the danger of the release of radioactive isotopes and the problems of disposal of nuclear waste. Despite this, between 1970 and 1996, the amount of electricity supplied by nuclear generation has steadily increased and will continue to do so until the year 2000 when old magnox reactors will begin to be decommissioned.

### Renewables

The renewables provide only a small percentage of UK energy supplies, mainly because of a lack of research, but also because many renewable sources such as wind and solar provide highly variable supplies and are not concentrated which makes it difficult for the electricity which they produce to be linked up with the National Grid. Biofuels presently account for 80% of renewable energy sources. Most of the remainder comes from large scale hydro-electricity production.

However, renewables are a key part of the long term strategy because, unlike fossil fuels, they will never run out and, apart from biofuels, they do not result in gaseous emissions (It is usually argued that biofuels do not result in **net** emissions of carbon dioxide).

### Future Policy

There are five key principles which underlie the government's energy strategy:

#### 1. Sustainability

Supplies should be sustainable so that future generations can enjoy the same level of energy services as people today. They must also be maintained at a competitive price. Although fossil fuels are finite -

they will run out - new supplies are being found and, as diminishing sources inevitably become more expensive, new alternative sources such as renewables or remote oil and gas, oil shales and tar sand will become economic to develop.

Renewables are expected to contribute 1500MW toward the National Grid by the year 2000. Under the **Non Fossil Fuel Obligation (NFFO)**, electricity companies were obliged to purchase a certain proportion of their electricity from nuclear power plants or from renewable power plants (i.e. non Fossil Fuel plants). This is expensive for the electricity companies since nuclear and renewable-generated electricity costs more than that generated from fossil fuels. However, the electricity companies are compensated for this by the government who add a levy to the end users of the electricity. Thus, the aim of the NFFO has been to encourage the further development of renewables by providing a guaranteed market.

#### 2. Decentralisation

The government strategy is to decentralise energy generation by developing a **large number of small scale, dispersed** plants. In practical terms this will mean the development of more renewable power plants - wind farms, wave generation plants for example and greater use of passive and active solar systems (see Factsheet 38 Environmental Implications of Renewable Energy). This will also encourage the use of **combined heat and power (CHP)** where waste heat from the power plant is used to heat adjacent industrial plants (eg. as at BP chemicals, Hull) or even local households.

#### 3. Clean energy

Gaseous emissions from the generation and use of energy sources must be strictly controlled. Acid rain and the enhanced greenhouse effect are international problems to which every country contributes. Air pollution does not respect international boundaries and the major users of energy have a responsibility to all other countries, but particularly those such as Bangladesh whose entire infrastructure could be threatened by events such as a global sea level rise. This strongly favours gas and oil over coal and nuclear and further strengthens the case for renewables.

#### 4. Efficiency

Consumers - both domestic and industrial - must be encouraged to use energy more efficiently. How this is to be achieved will be the subject of a future Factsheet.

#### 5. Privatisation

Liberalisation of the energy markets, a policy inherited from the last government should be allowed to continue. Liberalisation means the encouragement of private companies to become involved in energy generation and sale. It is believed that this will stimulate technological innovation and lead to cheaper energy. The underlying ethic here has remained one of free enterprise. Privatisation has accelerated the decline in the use of coal and increased the use of gas through Combined Cycle gas turbines. However, environmentalists are concerned that if energy becomes any cheaper, individuals and industry will use more, increasing gaseous emissions and that less attention will be focused on energy conservation and pollution control measures. Liberalisation has also stimulated the development of the 'one-stop' energy company, able to meet all energy needs. Thus, British Gas now supplies electricity and electricity companies are selling gas.

### Acknowledgements;

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**ISSN 1351-5136**