



# Changing patterns of power generation

Greg Chapman

Keyworth

In the past half-century the mineral basis of Britain's energy supply has changed profoundly. In 1948, when the coal industry was nationalised, coal provided almost all the country's electrical power, the only exception being a small contribution from hydroelectricity. Mechanical steam power, fuelled by coal, was still widely used in industry. Almost all domestic heating was by coal or coal-derivatives, notably coal gas, and the rail transport network depended entirely on coal, either directly for locomotives, or indirectly for electrified lines.

The advent of relatively cheap imported oil and, later, of oil and natural gas from the North Sea, with an additional contribution from nuclear power, has caused a collapse in the demand for coal for industrial and domestic use. However, while other uses declined, coal consumption for electricity generation continued to rise slowly until 1991. Then it too fell steeply as the the EC 'Gas Burn' directive was repealed, the electricity supply industry was privatised and the power generation companies began to build gas-fired plants with lower capital costs and more efficient operation. Particular milestones in the past twenty years have been 1983,

when nuclear power first contributed more than 20 per cent of total electricity generation, and 1996 when natural gas first attained 20 per cent and coal contributed only 43 per cent. The gas share of electricity generation has since risen to some 28 per cent in 1997, and total natural gas production has more than doubled since 1989.

---

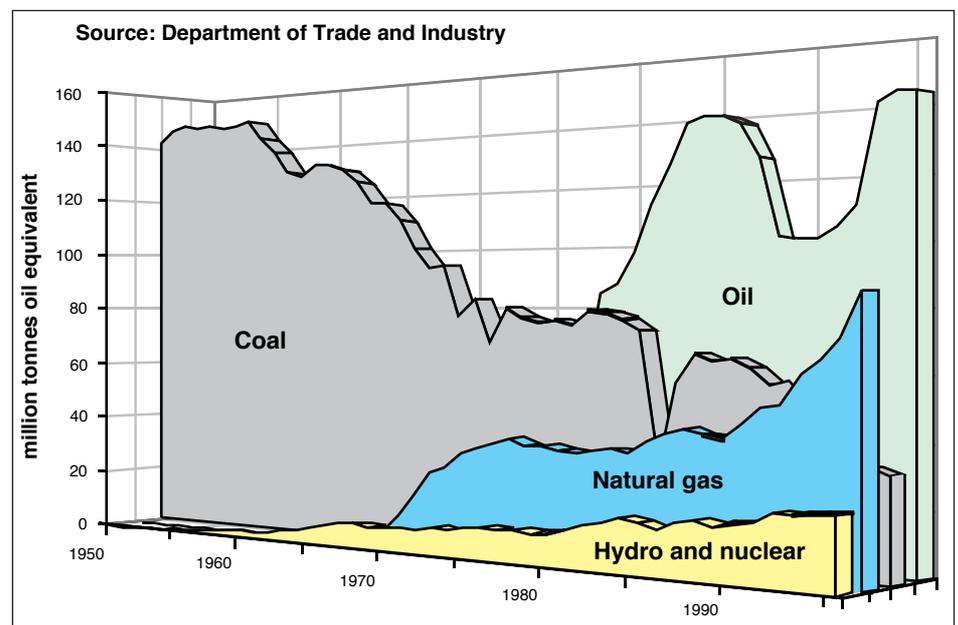
*"... early predictions that North Sea oil output would decline after the nineteen eighties have been proven wrong ..."*

---

Oil was first produced from the North Sea fields in 1975 and production built up quickly, reaching a peak of 122.5 million tonnes in 1985. Production then fell, due to falling oil prices, but early predictions that North Sea oil output would decline after the nineteen eighties have been proven wrong and production peaked again at 130.3 million tonnes in 1995. Onshore fields, although producing less than 5 per cent of the national total, have also shown a dramatic increase in production, from 77 900 tonnes in 1976 to 5.3 million tonnes in 1996, with most of the recent production coming from the Wytch Farm field in Dorset.

## UK energy

Continued concern about the effects on world climate of 'greenhouse gases' will be one of the factors that decides the future pattern of energy supply in the UK and throughout the world. Burning coal in power stations causes emissions of, in particular, sulphur dioxide and carbon dioxide, which will be increasingly constrained by international agreements. In the UK, opencast coal mining, while more profitable than underground mining, is widely opposed on local environmental grounds. Purely economic factors have caused the closure of most deep mines so that coal production in the UK has dropped even faster than consumption and the country that was once the world's leading coal exporter now finds that coal is, by value, its largest mineral net import. Natural gas, with lower carbon dioxide emissions per unit of energy generated and negligible sulphur content, is the favoured fuel for new power stations. It has been the largest component of primary energy consumption in the UK since 1996 and its second largest mineral net export. Its use will continue to grow, but the size of world coal resources indicates that coal will maintain its global position as a source of energy. How much of that market can be claimed by UK coal production remains to be seen.



Production of primary fuels in the UK, 1950–1996 (energy supplied basis).