

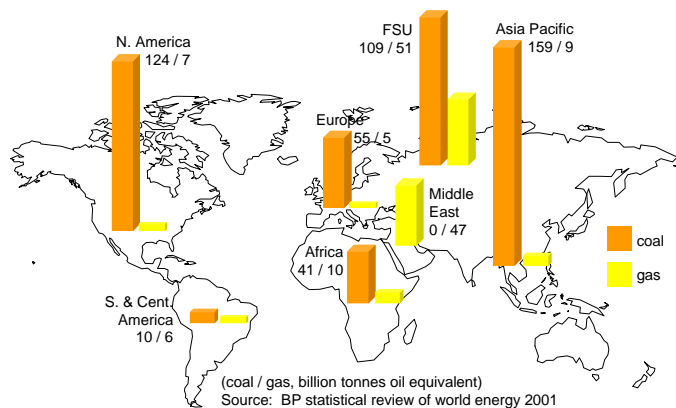
THE GOVERNMENT'S CLEAN COAL REVIEW

A Summary of UK COAL PLC's Submission
September 2001

Clean coal technologies are now more important than ever before as the UK Government wrestles to balance environmental and energy security objectives at an affordable cost. This paper, from UK COAL PLC, shows how modern coal technologies provide a clear route to not only the country's Kyoto target of a 12½% cut in greenhouse gas emissions by 2010, but also to the "deep cuts" of 60% before 2050 demanded by the Royal Commission on Environmental Pollution.

UK COAL mines 20 million tonnes of coal annually from its 13 deep mines and a similar number of surface mines. The company's deep mining operation is the most efficient in Europe. It calls on the Government to implement a "clean coal obligation" requiring electricity suppliers to purchase a proportion of their needs from new, coal-based power stations. Such an obligation is allowed under State aid rules and provides value for money: it is not a drain on public finances; Government sets objectives, industry competes to meet them; and, the public benefits with environmental improvements, increased security of supply, and affordable energy.

The UK has always taken for granted the long-term security and diversity of supply that coal offers at a low cost. We have well over 50 years of indigenous reserves, and internationally traded coal is available from politically stable countries around the world. Today, the flexibility and value of coal is being explicitly recognised as more owners of coal-fired power stations invest in the latest pollution control equipment and refurbish plant which lay idle until recently.

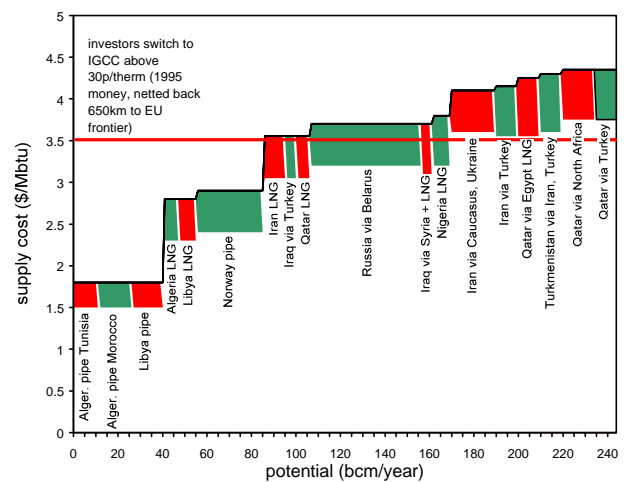


Distribution of global coal and gas reserves

In 1990, the remaining lifetime of UK gas reserves stood at 36 years; by 2000 this had fallen to

14 years, with just 6 years of proven reserves. The UK will soon become a net importer of gas, and by 2020 will import between 55% and 90% of its requirements (DTI, 1998).

Sourcing this gas is a concern. With half of the world's reserves controlled by Gazprom in Russia and the Iranian National Oil Company, the likelihood is of price control by an OPEC-style cartel. The UK, at the end of long pipelines passing through many countries from these regions, would be subject to the highest transportation charges and greatest risk of supply interruption, especially given the vulnerability of gas pipelines.



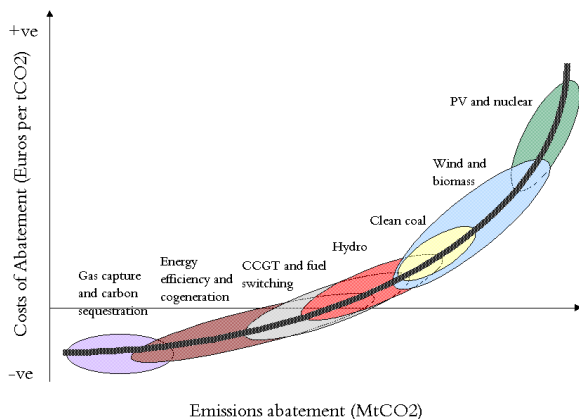
Potential natural gas imports into EU (IEA, 1995)
(cf 240 bcm import demand by 2010)

In the USA, blackouts in California came after the State allowed an over dependency on natural gas without any regard as to whether consumers could afford this in the long-term. The UK should learn from that mistake.

There are logical choices: the UK can become dependent on gas from Russia and the Middle East, it can take the clean coal technology route, or it can look to nuclear. The coal option offers security and certainty at an affordable cost. Clean coal technologies can deliver carbon dioxide (CO₂) reductions from the electricity sector in a scenario where one third of electricity comes from CO₂ neutral sources (renewables and nuclear), one third from gas and one third from coal to provide an unprecedented level of energy security. Allowing the market to determine the fuel mix for power generation is not the answer; fixes, such as carbon taxes or emissions trading, place no value on security.

Some capture and storage of CO₂ will be needed since coal has a high carbon intensity. The costs of this are not prohibitive - the UK needs CO₂ to extend the life of North Sea oil fields. For example, enhanced oil recovery by CO₂ injection at the BP Forties field would provide the Treasury with a

£300 million windfall, enough to support a technology demonstrator. The cost per tonne of avoided carbon emissions is far less than with the UK's Renewable Obligation (£312 /tC).



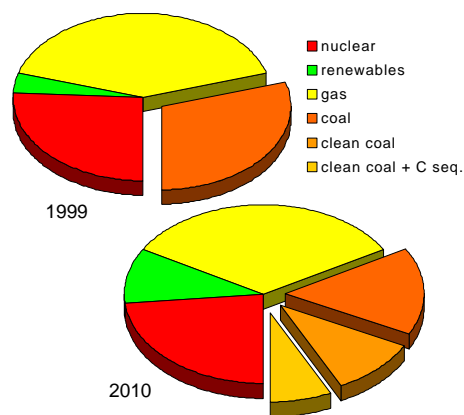
Schematic cost-abatement curve for greenhouse gas abatement (ETSU, 2000)

With carbon sequestration and the use of hydrogen as a clean energy carrier now seen as long-term objectives, there is only one viable technology choice - the conversion of coal into a clean synthesis gas (syngas) for power generation in Integrated Gasification Combined Cycle (IGCC) plants. This technology brings many benefits over the steam technology found in today's power stations which is now reaching the limit of its natural potential.

IGCC builds on the success of gas turbines for power generation and, with fuel cells, its conversion efficiency will continue to rise (40-45% today, potential to reach 50% in the near term and >60% in the longer term). Pollutant emissions from IGCC plants are comparable to natural gas-fired combined cycle gas turbine plants and CO₂ can be removed efficiently from syngas prior to combustion to leave a hydrogen rich gas - fuel for the future.

Gasification technology provides a clean disposal route for many difficult wastes: municipal solid waste, sewage sludge, plastics and refinery residues. This fuel flexibility provides arbitrage opportunities between conventional fossil fuels (coal, heavy fuel oil and natural gas) at a single plant to give consumers protection against high electricity prices.

Government support of a commercial demonstration programme would provide a shop window for the UK power industry. By showcasing the best available clean coal technologies, the industry could look forward to export earnings of over £35 billion over the next 15 years (Foresight, 2001). Companies involved in project development, engineering design and consultancy, equipment supply, project management, civil contracting, operations & maintenance, banking, legal services and insurance would all benefit.



A secure and diverse fuel mix for the future

Natural gas is a premium fuel that can be used with very high efficiency in small-scale domestic applications, in commercial plants which genuinely combine heat and power, and in road vehicles to reduce traffic pollution. The UK has depleted its own reserves on a brief foray into power generation. Coal offers long-term security and diversity of supply at an affordable cost. In its paper, UK COAL presents a case for a commercial-scale Clean Coal Technology deployment programme of 5,000 MW or more, with some power stations fitted with carbon capture and sequestration. The technologies needed are available today and, with the right incentives, provide Government with the basis for a sustainable energy policy that meets the long-term objectives identified by the Royal Commission on Environmental Pollution at a cost consumers can afford.

References

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The full text of UK COAL's submission to Government can be found on the company's website.

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