

DAVID JENKINS

No fuel like an old fuel?

What part will each of the fossil fuels play in supplying energy demand and how will the fossil fuel industry respond to the need to reduce emissions from not only its own activities, but also those of its customers? Dr David Jenkins teases out the issues prior to the session he will chair...

Throughout the 20th Century, global economic growth has benefited immensely from the use of relatively low cost fossil fuels. And in addition the UK has had its own abundant indigenous resources, initially of coal and subsequently offshore gas and oil.

Unfortunately this rather benign UK energy picture is about to change. During the first half of this century we will be faced with a number of choices. Because of the long run nature of energy investment the way we respond to them will set the framework for decades ahead. It is therefore necessary that the choices are well informed. The purpose of the sessions at the Geological Society's conference in October 2005 is to inform the debate, both with respect to the technical and economic aspects of the choices, but also to examine the impact on society and the way society might respond.

The factor that is introducing the most uncertainty into long range planning for energy futures is climate change and the contribution considered to be related to increases in the atmospheric concentration of CO₂, attributed primarily to the burning of fossil fuels. In the 2003 White Paper the UK set itself a CO₂ emission challenge of a 60% reduction by 2050 and there is a developing scientific and political consensus that mankind should endeavour to limit the maximum atmospheric concentration level to 550ppm. If this remains a primary objective function for energy policy, it will require dramatic changes to the pattern of production and consumption.

Concerns over CO₂ have led many commentators, particularly those from the NGO community, to insist that there must be a major shift in energy sources away from fossil fuels and towards renewable energy. However it has been known for many years that low emission energy from fossil fuels is a perfectly feasible option, both for the generation of electricity and through reforming, for the production of hydrogen for transport. In both cases the CO₂ needs to be sequestered in a permanent manner. The technology for this is known and the issues are being discussed progressively more widely. Professor Socolow of Princeton University will address the subject and the fossil fuels session will examine the technical, economic, legislative and social factors that need to be

considered in the course of evaluating the role that fossil fuels should continue to play in a balanced UK energy mix for the 21st Century.

Given such a demonstration of the potential for emission free energy from fossil fuels, the ongoing practical issues will be the nature of their availability long term and to a lesser degree the potential concern about security of supply, from the Middle East for oil and Russia for gas. Ian Vann from BP will cover oil & gas and Mike Henry from BHP Billiton will deal with coal.

During the time frame we are considering, the key issue for oil will be whether the global oilfield will peak in the sense that demand will have to adjust downwards to accommodate reduced supply (as opposed to the historical trend, where the requirements of rising demand have always been met). When this peak does finally happen there is likely to be a significant upward adjustment in the price, which as in the late 1970s will lead to an enhanced focus on efficiency and conservation, particularly in personal transport. Recent advances in hybrid technology offer scope for substantial improvements in fuel economy.

Gas resources are larger than oil reserves, but during this mid-century time frame we need to confirm that they are capable of meeting UK requirements, when set in a global demand context. If the LNG market place evolves to replicate the spot market for oil, then the potential diversity of supply will alleviate the UK's current concerns around dependence on limited pipeline routes. And further development of GTL (gas to liquids) technology may help to enhance global liquid supply.

Coal is globally abundant, but the cost structure of the long distance transport market needs to be evaluated before we can say with confidence that there is ample low cost availability for the UK market, to compensate for reductions in supplies of oil and (at least sometime during the 21st Century) possibly also gas. The distribution of coal resources is also globally diverse. In addition to electricity generation, conversion of coal to liquid transport fuels is perfectly feasible and can be accomplished emission free, using equipment for CO₂ separation and sequestration. We should recognise though that such engineering does involve a step change in the cost of energy, albeit one that still appears to be less than from the current generation of renewable sources.

It is therefore important that if the primary driver for energy production in 2050 is a major reduction in CO₂ emissions, then emission-free fossil fuels should be permitted to compete on a level playing field.

It is clear that within the time frame being addressed by the question, there is some uncertainty around resource availability, but the primary uncertainty

concerns the degree of commitment to a very aggressive target for reductions in CO₂ emissions. Current policy as expressed in the 2003 White Paper retains a somewhat restricted perspective on the options for achieving this outcome. This conference aims to widen that perspective and hopefully lead to a discussion that can consider a wider range of options and make more informed recommendations on an integrated energy policy that addresses all the major issues.

One aspect, though, that is strikingly absent from the current energy debate is the requirement to provide incentives for the end use consumer to contemplate any radical change in his or her approach to the consumption of energy, or to move to lower emission sources. Policy remains wedded to using the tax system to penalise consumption, as opposed to considering innovative techniques to encourage consumers to conserve energy. Unless we are able to bridge this intellectual and fiscal policy gap, it is unlikely that any of the targets will be met and energy policy will encounter progressively more strident opposition.