THE FOUNDATION FOR SCIENCE AND TECHNOLOGY

DINNER/DISCUSSION SUMMARY

UK Energy Policy – what are the economically attractive supply options and what percentage should each option supply?

Held at The Royal Society on Wednesday 8th March, 2006

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Alstom Power Ltd
Advanced Research and Assessment Group, Defence Academy of the United Kingdom
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And
UKAEA

Chair: **The Rt Hon the Lord Jenkin of Roding**
Chairman, The Foundation for Science and Technology

Speakers: **Peter Mather**
Director UK and Vice President, Europe Region, BP
Dr Robert Hawley CBE DSc FRSE FREng
former Chief Executive, British Energy
Ross Howard
Partner, Energy, Infrastructure & Utilities, Deloitte
Professor Keith Palmer
Non-executive Vice-Chairman, NM Rothschild & Sons

Professor Palmer's talk emphasised the importance of risk in determining what forms of power generation could be funded on the market. If the risk was seen to be high investors would look for a high return. In the case of low carbon technologies one of the risks to be considered was a reduction in the price to be paid for carbon emissions, which shifted the competitive balance between high and low-carbon technologies. No Government could give long-term guarantees for the future fiscal regime.

In discussion it was suggested that Government funding could be used to overcome this obstacle, because the Government could borrow cheaply. Against this it was argued that that would mean taxpayers picking up the risk. The object of privatising the power generation industry had been to leave it to private investors to assess and carry the risks. Certainly public funds could be used to stimulate research and development by subsidising infant technologies, within limits, but the danger then was that the Government would be drawn into trying to pick winners. There should be a level playing field for the competing technologies, including a single price to be paid for all carbon emissions. That should apply to all technologies, including nuclear power. Even if uranium fuel only accounted for about 15% of the costs of generating nuclear power, it was argued that the energy costs of extracting and processing it represented a significant carbon cost for every kilowatt hour generated.

It was suggested that there would be no certainty over long-term carbon prices until there was a global decision to get serious about carbon emissions. Others agreed that action needed to be world-wide. The UK or Europe could go it alone, but this would be liable to create costs.

A speaker saw a danger of over-simplifying the economics of different forms of power generation. In assessing possible outcomes on different assumptions about the oil price and the carbon premium a range of values should be modelled, because small variations could lead to very different results. It might also be necessary to discriminate between different forms of one technology. Thus the costs of offshore wind generation were likely to vary according to the distance from the coast. The speaker argued that investment in nuclear power was inherently risky when compared with low carbon technologies because it involved heavy expenditure upfront, there was uncertainty over the long-term fiscal regime, and global proliferation and terrorism were factors to be considered. In response it was argued that the absence of any guarantee over the future carbon emissions regime was the reason why the market was reluctant to invest in renewable forms of power generation. They could only compete so long as high-carbon technologies were penalised.

Some unease was voiced over the rationale for discounting future costs for the purposes of investment appraisal. It worked both for and against nuclear power, because new building incurred heavy initial costs but the long-term costs of dealing with waste

were heavily discounted.

The invited speakers had cautioned against looking for magic bullets, but some participants in the discussion identified possible candidates. One might be to reduce transport costs by encouraging people to work from home, substituting electronic communications for travel. Against this it was observed that human beings valued human contact and would not be happy to communicate entirely through screens. Another suggestion was that more could be done to promote energy efficiency in the heating of buildings. There was no point in debating how best to pour water into the bucket if it leaked out of the bottom. One speaker, who had been involved in a debate on energy policy in the Scottish Parliament in a building that was ablaze with light, suggested that new buildings could be more wasteful of heat than old. Saving energy depended on human behaviour. In any case, though, it was hard to believe that the emerging energy gap could be bridged by reducing demand.

It was observed that the subject of the debate was UK energy policy, yet much of the discussion had focussed on the narrower question of how to generate electricity. Power stations threw away half the energy they used in the form of heat. A number of speakers advocated combined heat and power (CHP) systems as a way to make use of the heat which otherwise went to waste. Greenpeace[1] had that day published a report on decentralised, small scale CHP which not only made use of the heat generated but minimised distribution costs. It was noted that in France nuclear power stations had been located near towns, which were able to use their waste heat. In Sweden, by contrast, they had been put in remote areas because of concerns over safety and were now being decommissioned.

One speaker took the view that there was limited scope for reducing dependency on oil, but that it could be used more efficiently by putting the reserve generating capacity, which was mostly in the form of diesel-engined generators, to work in local CHP schemes. Another participant agreed that there was a place for this, but only as one ingredient in the mix. It would be a mistake to back a single solution, whether CHP, nuclear power or windmills. Against this it was argued that if the consensus was in favour of going for a bit of everything, nothing would ever be done.

The invited speakers had referred to concerns over the security of supply of hydrocarbon fuels, given the location of the major oilfields. A participant wondered how real a factor this was. Some had suggested that it was 80% neurosis. One response was that the oil industry had had to get used to political upheaval in supplier countries. Ultimately producers needed customers in order to feed their growing populations, so it was not in their long-term interests to cut off supplies.

Another question about security of supply concerned power generation from wind and waves. Output was predictable over the course of the year but liable to fluctuate in the short term. On one view this was a serious problem once reliance on such sources went beyond a certain point, as it had in Schleswig-Holstein. A counter view was that people could learn to live with an inconstant electricity supply, either by using standby power or by adjusting their demand. The freezer did not necessarily have to run at the same time as the television.

It was reported that onshore wind power suffered from a further problem: the reluctance of planning authorities to give consents for wind turbines.

A speaker pointed out that responsibility for energy policy in the UK was shared between DTI, Defra and the Office of the Deputy Prime Minister. There might be advantage in having a single Minister in the Cabinet to lead on it. So far as the private sector was concerned, however, it was suggested that this mattered less than having a simple, predictable fiscal and regulatory regime.

In concluding comments it was asked whether there could be confidence over bridging the energy gap in five to ten years' time in the absence of new nuclear power. It was also observed that no-one had ever been killed by an accident in a nuclear reactor in the UK, that the costs of nuclear power were low, that other countries were succeeding in storing waste underground, and that problems with nuclear generation usually arose from the conventional equipment rather than the reactors.

Jeff Gill

Useful web links:

Department for Trade & Industry Energy Review:
www.dti.gov.uk/energy/review/index.shtml
House of Lords Debate 16th February 2006 - Energy Policy: Nuclear Power:
www.parliament.the-stationery-office.co.uk/pa/ld199697/ldhansrd/pdvn/lds06/text/60216-11.htm#60216-11_head0
Deloitte 2020 Vision Document
www.deloitte.com/dtt/cda/doc/content/UK_EIU_2020vision_V3_Final.pdf
UK Energy Research Centre
www.ukerc.ac.uk
The Foundation for Science and Technology workshop and CUGPOP summary 9th July 2005: What is the future for nuclear power in the UK
www.foundation.org.uk/801/090705.pdf
Sustainable Development Commission Report
www.sd-commission.org.uk/publications/downloads/SDC-NuclearPosition-2006.pdf
Woking Experiment
www.woking.gov.uk/environment/sustain/report/20042005.pdf
FST Journal – Energy Security of Supply, Vol. 18, No. 8
www.foundation.org.uk.pdf18/fst18_8.pdf
STP discussion workshop on reframing the Energy Innovation Agenda, Design Museum, London, March 14 2006
www.sustainabletechnologies.ac.uk/news.htm#5
www.alstom.com, www.bp.com, www.cclrc.ac.uk
www.da.mod.uk/DefenceAcademy/colleges/ARAG
www.nmrothschild.com, www.ukaea.org.uk

[1] www.greenpeace.org.uk/MultimediaFiles/Live/FullReport/7441.pdf