

DINNER/DISCUSSION SUMMARY

Energy Policy: The Renewables Targets

Held at The Royal Society on Tuesday 25th November 2003

Sponsors:

BRIT

**Natural Environment Research Council
Royal Academy of Engineering**

In the Chair: Dr Robert Hawley CBE DSc FRSE FEng

Deputy Chairman, The Foundation for Science and Technology

Speakers: Dr Bernie Bulkin

Chief Scientist, BP

Dr Malcolm Kennedy CBE FEng

Chair, Energy Working Group, Royal Academy of Engineering

Ms Claire Durkin

Director, Energy Innovation and Business Unit, DTI

DR. BULKIN said that there were four pressures on energy policy – political (security, diversification, the rich/poor divide), environmental (e.g. air quality), cultural (disapproval of wastefulness) and technological (the effect of new technologies coming to market). All four pressures could benefit renewables, depending on cost and scale, and taking into account that renewables compete on either the wholesale or retail level. Cultural change, which could be sudden, was the most effective, if it made citizens feel that they were making a real contribution. Of the various renewables, wave and tidal were niche; hydro already exploited and geothermal unimportant in the UK; biomass of local significance; but wind and solar capable of major impact. Look to the active areas of science to see how individual renewables might progress – biotechnology will impact biomass and waste; material science, solar; but no action area benefits wave and tidal. Wind might benefit in efficiency from information technology, but there will be no breakthrough. If renewables are to meet the 10% target, it will be by breakthroughs in the background science; this means solid backing by government.

DR. KENNEDY said that the government's targets on renewables were unrealistic, unless much harder thought was given as to how they might be achieved, and major obstacles overcome. In practice, the only technology now available which could significantly impact this target was offshore wind; this meant creating 80,000 MW of renewables – i.e. 10,000 machines or 1000 separate projects must be specified, bid for, managed, commissioned and maintained. To this add 5,000 MW of CHP, or another 1,000 machines. In practice we need to put in 4 machines every day up to 2010. We are talking of an investment of £15bn, to which the cost of rewiring needs to be added. Don't expect to be saved by a new technology suddenly coming to market – it took 25/30 years for new technologies – e.g. zips, fluorescent lights – to become accepted by markets. The difficulties in the way of producing this

amount of wind power were enormous – environmental and MOD objections; the shortage of technically qualified staff; manufacture and building capacity; financial sustainability; the four to five year gap between price reviews; unknown technical problems with offshore systems; the uncertainty about future policy on Renewable Obligation Certificates (ROCS); the limitations of the grid and distribution systems. Basic was the not unreasonable City scepticism about investing in electricity. Where was the money coming from? The government's targets meant turning the distribution systems upside down – consumers would also be producers and the network had to be interactive. The barriers to developing distributed generation must be overcome. Its benefits were not recognised: existing security standards were out of date; there was no incentive for distribution network operators to cooperate; and there were still technical problems. But, he was, for an engineer, an optimist. The target could be met, but only if the realities were confronted.

MS. DURKIN was glad to learn of Dr. Kennedy's optimism. She, too, believed that the target could be met, but only if the problems were identified and understood. She stressed the background commitment of the Government to confronting the problems of climate change, but also the commitment to working in the context of ensuring security of supply, the competitive working of markets and affordability, including the reduction of fuel poverty. She acknowledged the low base from which we were starting – only 1.7% of supply was covered by renewables obligation, and accepted that of the 10% target by 2010, 7 to 8% would be wind. Looking at the German and Spanish outputs – Germany 2 GW a year – the target was not impossible. Some of the barriers identified were being managed – finances were being helped by exemptions from the climate change levy, and ROCs, and £350m capital grants – significant in public expenditure terms, although, she recognised, small in relation to the investment needed. The new planning guidelines, which urged

authorities to encourage, rather than restrict, renewable energy plants and joint working parties with the MOD would also help overcome delays. Work was also going on about major redesign of distribution networks and the effects of the timescale of price reviews. It was important to look beyond 2010 to 2020 where there was the prospect of major technology breakthroughs – e.g. tidal and wave power, and fuel cell/hydrogen technology. What was important was to spend funds wisely, and for this an integrated and coherent strategic approach to research was needed. The UK Energy Research Centre in collaboration with the Research councils would help provide this. A key need was to inspire young people to enter engineering and technical training; this could be done by inspiring them with the prospect of jobs and work of environmental benefit within a dynamic energy structure.

A significant theme in the discussion was the compatibility of the various objectives in the White Paper and the context in which the government was placing them. Was, for example, the commitment to competitive markets compatible with the renewables target? Germany and Spain had been cited as examples of how quickly renewable capacity could be built, but their industries did not operate in a competitive market, but one dominated by monopolies. The competitive market mantra had so far resulted in UK generating and distribution capacity falling into the hands of continental and US companies; they would be unlikely to show enthusiasm for developing competition. Reducing fuel poverty was a social aim, and should not be part of an energy policy. Reduction in fuel poverty so far had been produced largely by the reduction in gas and electricity prices, and continuing low prices (although admittedly they had now risen) were not an incentive to investment. If affordability was to be regarded as going wider than fuel poverty, and taken as helping to maintain an effective market by avoiding shocks, serious consideration needed to be given also to giving reassurance to investors about future pricing and policies which would affect prices, such as extension or withdrawal of ROCs and exemptions from the climate change levy. The government must have made an assessment of the amount, and the return on capital necessary to meet the renewal targets, and it should be considering its market objectives in the light of these.

Speakers returned frequently to the question of the likely profitability of renewables, and the incentive to invest. Wind power had so far found investment and was showing a return, but it was so far largely onshore and the greater risks of going offshore had yet to be subject to market reaction. It had also the benefit of ROCs, but again the question arose about their long-term security. But, we did not really know how much the additional wind power would cost; only historic cost was available. But it seemed that onshore wind power was now competitive with oil and gas generation. The government and Ofgem were searching for innovative economic and financial structures, which would create incentives to invest in distributed generation, but they had yet to be seen to be viable. Had the investment community taken on board the fact that the cost of carbon will continue to rise and affect fuel competition? Had the effect of cultural change, suggested by Dr. Bulkin as a powerful agent, been realised? There were reasons why the City might become more interested in investment in distribution and renewable

generation, but the time scale, if the targets were to be met, was short. To enable investment to take place, which would produce the same scale of CHP in the UK as in Denmark, you would need the prescriptive legislation which required hot water mains to be laid in every town.

Speakers generally accepted the view that wind was the most important technology to achieve the 10% target, but one speaker felt that the possibility of tidal stream (not tidal barrage) technology had been underestimated. It was proven and had little environmental impact; it could make a substantial contribution earlier than expected. Enabling technologies, such as DC transmission, superconductivity, (which could also have a significant impact on carbon reduction by allowing electricity to be transported from gas fields, with the carbon from the gas being sequestered in the reservoir), and storage technology (compressed air) would help, but the scale, cost and timing of their contribution was uncertain.

More funds for well directed Research and Development were important, given the paucity of funding in the past, compared with the funding in Germany and the US. But, in the present public spending climate, there was not likely to be any increase. What was important was that it was spent in accordance with a coherent strategy. It must be clear where the money was going and how it contributed to the "big picture".

The big picture must include nuclear. Without it, there was a looming energy gap in Europe and security of supply could not be guaranteed. But had nuclear a future? Did the text of the White paper – "keeping the nuclear option open" mean anything, given the approaching retirement of Magnox plants and the long time scale (and uncertain economics) of building new nuclear capacity? There is a danger that politicians use the promise of renewables to avoid having to tackle the question of nuclear – leading to long term additional costs and problems of base supply. Not that this was without international benefit - the Danish wind industry profited by Californian research and development money. What was the US experience? Views varied but some speakers felt confident that nuclear would remain an important energy source. There were inevitable arguments about its costs, and in particular, whether the development and decommissioning costs were fully included. But the main obstacle to further nuclear development in the UK was the shortage of nuclear engineers. Existing skills had been lost and to create a new skilled work force would take time - although a speaker reminded the meeting that in the 1950s the nuclear industry had developed from a workforce that had no nuclear training. Another element in the big picture is energy efficiency. 80% of energy use is unmanaged, largely because it is a small element of users' costs. Increasing prices is a blunt instrument but if the government signalled a determination to use prices as a long-term means of reducing use, then it could be effective.

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