

Double or Quits?

The Global Future of Civil Nuclear Energy

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Among the many disputes in the field of energy, in many countries none appear to be as acrimonious as those surrounding nuclear power. Its supporters are confident that nuclear power will have an important long-term future on the global energy scene, while its critics are equally confident that its days are numbered and that it was only developed to provide a political fig-leaf for a nuclear weapons programme. Both sides believe the other to be thoroughly biased or stupid and there is little constructive debate between them.

As the disputes rage, especially over such issues as the management of nuclear waste, the economics and safety of nuclear power compared with other sources of electricity, the possible links with nuclear weapons and the attitude of the public towards the industry, decision-making is either paralysed or dominated by those who shout loudest. As a result, governments, industry and the financial sector have in recent years found it increasingly difficult to develop policy in this field.

Deciding about future energy developments requires balanced and trustworthy information about issues such as the relative environmental effects of different options, the safety of installations, economics and the availability of resources. This is of particular importance now because world energy use is expected to continue to grow significantly during this century, particularly in less developed countries. In the same period, global emissions of greenhouse gases, especially carbon dioxide, will have to be severely curbed. To meet both these requirements may well involve a step change away from being able to meet growing energy needs by depending on an ever increasing supply of carboniferous fossil fuel.

To address this situation, the Royal Institute of International Affairs undertook a two-year research project, aimed at providing information from the standpoint of an organization with no vested interest in either the pro or the anti camp, but close connections to both. The project has aimed

to illuminate the differences, rather than to adjudicate among the various 'sides'.

The question at issue is what role nuclear energy might play in this new world. It could be expanded rapidly and it clearly has the potential to contribute to mitigating climate change. However, as indicated above, the industry presents a number of challenges. The aim of this project has not been to come to judgments as to what role, if any, nuclear power will or should play in future energy supplies, but rather to expound and develop, from an uncommitted standpoint, the arguments used by proponents and opponents of the technology.

Nonetheless, we feel it appropriate to highlight some themes which have emerged:

- ① The nuclear option will always remain 'open', in the somewhat trivial sense that the technology is understood, and records can be maintained even if no more stations are built and existing ones come off-line. To restart such an industry, though, would be a major and lengthy undertaking, while the uncertainties and the size of the challenges associated with the issue of energy and the environment over the next decades are considerable and can emerge rapidly. It can be argued, then, that actions should be taken now to ensure that nuclear power is available as a practical option.
- ② The extent to which such actions should be taken will depend on such factors as perceptions of the size of the energy challenges, the extent to which nuclear technology can evolve and matters of politics and values. However, given the timescales involved, serious consideration must be given to what actions (if any) are required now, and in the near future, if the nuclear option is to be kept meaningfully open for, say, the year 2020.
- ③ The track record of nuclear energy, so far, is a matter of dispute between supporters and critics of the technol-

ogy. To its supporters, nuclear power has largely fulfilled its early promise — it now generates about one-sixth of the world's electricity, having been the fastest growing of the major energy sources in proportional terms throughout the 1970s, 1980s and 1990s. It does so safely (it is among the safest of the major energy sources, according to some studies) and without emitting significant quantities of greenhouse gases. To its opponents, nuclear power has not fulfilled its promises — in terms of economics, the failure to find a waste management route, the potential for major accidents and terrorist attacks, and the way the industry has behaved towards society. They believe that a 'second chance' should only be contemplated in the most extreme of circumstances, if at all.

The reality, we suspect, lies between the extremes.

④ As regards the future, the extent to which nuclear power will appear attractive will depend on impressions of two main factors — the 'environment' in which it is operating, and its own intrinsic features. Several elements within this environment are largely outside the control of the nuclear industry itself. In a future of energy shortages, disappointing performance of renewables and acute fears about climate change, for example, nuclear power would presumably look more attractive than in a future of limited energy demand, flourishing renewable industries and perceptions that climate change is manageable.

⑤ As noted earlier, the nuclear industry itself might be able to take a number of steps to make itself more attractive, for instance by developing smaller and cheaper reactors, but there are potential logjams. Even supposing that acceptable technical solutions, at reasonable cost, can be developed for the major areas of concern, it might nonetheless prove very difficult to reach that state of development. For example:

- ◆ companies might not be prepared to put in the research, development and commercialization effort necessary to demonstrate cheaper and safer nuclear designs without a reasonable prospect that such designs will find a market, but such a market may not emerge until the designs are ready.
- ◆ development of novel waste management techniques such as partition and transmutation may only make sense if there is an expanding nuclear industry, but such expansion may be impossible without new ways of managing waste.

Similar problems may be encountered with respect to renewables, carbon dioxide sequestration and perhaps even demand-side technologies. In order to ensure that solutions to the major areas of difficulty become feasible, governments — either alone or in international collaboration — may have to act now, or very soon, to ensure that there are ways of clearing these logjams by providing stimuli for progress.

Perhaps the most difficult issue is over the construction of demonstration plants. If private companies should prove unwilling or unable to build such facilities, the financial risk being too great, then, in our view, governments should be prepared to take steps to ensure that such plants are built. Without them much of the longer-term research effort is likely to be wasted.

⑥ Governments will also have to create the circumstances in which there is a sufficient supply of suitably qualified individuals to staff the industry and the regulatory bodies — this is true whether the industry contracts or expands. Governments may also have to act to ensure that sufficient funds are being put aside to deal with waste management and decommissioning in the long term.

⑦ Finally, there is the issue of how the industry can make itself more acceptable to the public and how to involve it in the decision-making process. As the industry has lost its favoured position with governments, so it seems to have lost some of its early arrogance. Considerable thought is being given to ensuring that the public is, and feels that it is, contributing to the decision-making process. This trend must continue if the feeling, still prevalent in some circles, that nuclear power is something imposed upon, rather than a part of society, is to be overcome.

In the immediate future, it looks likely that the 'centre of gravity' of nuclear activity will continue to move away from North America and Western Europe and towards South and East Asia. Before long, however, a new understanding between the people, governments and nuclear industries in the industrialized world may be needed. Such an understanding should open the way for proper international appraisal of whether, and in what circumstances, nuclear energy might make a positive contribution to meeting the energy and environmental challenges that the world has to face in the twenty-first century.

This article has been adapted from the Briefing Paper, "Double or Quits? The Global Future of Civil Nuclear Energy" issued by The Royal Institute of International Affairs, April 2002. At the time of the paper's issuance, the late Peter Beck and Malcolm Grimston were Associate Fellows with the Sustainable Development Program at the Royal Institute of International Affairs, also known as "Chatham House," in London. For the complete briefing paper, visit www.riia.org/pdf/research/sdp/Nuclear_Double_or_Quits.pdf and for further information on the Sustainable Development Program please visit the Institute's website at www.riia.org.

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