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## Nuclear Energy: Public Perceptions and Decision-making

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### Introduction

The nuclear debate can be caricatured as a battle between two diametrically opposed groups, who nonetheless seem to share a large number of features in common.

<b>The Advocates</b>	<b>The Opponents</b>
Belief that major elements of the future are predictable; certainty about general projections of various energy sources. (For example, renewables demonstrably have the practical potential to remain only relatively minor players in world energy supply).	Belief that major elements of the future are predictable; certainty about general projections of various energy sources. (For example, renewables demonstrably have the practical potential to dominate world energy supply).
Absolutely certain about the future role of nuclear power (a major and important one), and about issues such as nuclear waste (not a difficult technical problem).	Absolutely certain about the future role of nuclear power (no role at all), and about issues such as nuclear waste (a technically insoluble problem).
Arrogance born out of belief in infallibility of own analysis.	Arrogance born out of belief in infallibility of own analysis.
Belief that the public is irrationally frightened of nuclear power. If only people could be properly educated they would become more pro-nuclear and support the nuclear industry.	Belief that the public is irrationally complacent about nuclear power. If only people could be properly educated they would become more anti-nuclear and support anti-nuclear campaigns.
Characterisation of opponents as either fools or ill-intentioned.	Characterisation of opponents as either fools or ill-intentioned.
Belief that government is not to be trusted to take wise decisions as it is too much influenced by the anti-nuclear media and pressure groups.	Belief that government is not to be trusted to take wise decisions as it is too much influenced by the nuclear industry and its supporters.

There is an impression, at least in some developed countries, that nuclear power is especially unpopular among energy sources. It is further assumed that unless and until this unpopularity can be overcome, nuclear power will not flourish, even if the case for it to do so on other grounds were to be strong. It has proved particularly difficult in many countries to find new sites for nuclear facilities. In addition, there are some fears about nuclear installations in neighbouring

countries (for example, Austrian concerns about the Temelín plant in the Czech Republic, and Irish objections to Sellafield in the UK). However, in its early days, nuclear power was broadly accepted, often with enthusiasm, in many of those countries where it is now deemed unpopular.

Some of the factors behind the loss of public confidence in some developed countries were caused directly by the industry itself. The construction times and costs of many plants were far higher than projected. The performance of many plants was disappointing. The accidents at Three Mile Island and Chernobyl also served to exacerbate growing mistrust of the 'nuclear industry' and its often vocal supporters within governments. This mistrust had its origin, at least in part, in the arrogance and secretiveness of nuclear spokesmen in many countries. The suspicion that the industry and its supporters were able, for example, to put undue pressure on regulators further damaged their public credibility. Critics of the industry often had no apparent vested interest to do so, while the industry's responses increasingly came to be discounted – 'they would say that, wouldn't they?' The passion which has surrounded the nuclear debate in recent years is to a considerable degree a legacy of these factors.

At the same time, perceptions of the availability of alternatives were changing. When global fossil fuel supplies were under apparent threat (notably in the 1950s and again in the ten years from 1973 onwards), nuclear programmes were instituted in many countries with relatively little objection, at least by today's standards. The discovery of vast reserves of gas, as well as oil, coupled with low prices and the development of the highly efficient Combined Cycle Gas Turbine by the mid-1980s, reduced the apparent need for nuclear power in many developed countries. (This perception is not shared in some developing countries, notably India and China, nor by Russia.)

In reality, even within developed countries most people holding a view on nuclear technology are prepared to accept strengths and weaknesses in both sides' views. Many of those who are not firmly committed to one side or the other of such debates show willingness to move their position, for example as new information becomes available.

However, the level of emotion employed by the die-hards on both sides of the debate is unlikely to be an aid to reaching careful and considered decisions about the future of nuclear power. Ultimately decisions must be taken, and those decisions will not satisfy everyone.

### **Public Opinion**

Considerable caution must be exercised when interpreting 'public opinion'. The very concept 'public' is of limited usefulness in a modern pluralistic society. The population is better viewed as an interlocking pattern of smaller 'publics'; any particular individual may, moreover, move from one 'public' into another, if, for example, proposals are revealed to construct a major project near their house.

The results of opinion polls, therefore, are notoriously dependent on the particular question asked. They can also be very volatile. A number of themes may, however, be detected. Whether a particular person or group of people tends to be

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pro- or anti-nuclear at a particular moment depends on a number of features, including:

- perceptions of the ‘need’ for the technology;
- perceptions of risk – nuclear power tends to be less popular in the immediate aftermath of an accident, while people who are more familiar with the technology, perhaps through having lived near an operating plant for some years, tend to be less worried than those who are not;
- social/political/psychological factors – political parties within a single country can hold radically different views on nuclear technology; people whose jobs depend on the local nuclear facility tend to be more pro-nuclear than those who do not.

It should be stressed, though, that these are at best tendencies – there is always a range of ‘opinions’ among people from the same country and apparently very similar backgrounds. Many developing countries have anti-nuclear movements, even if they may be small, and environmental pressure groups are increasingly establishing themselves in the developing world.

A number of specific explanations have been suggested for the apparent special unease felt about nuclear power in many countries. They include:

- links to the military, both real (the development of shared facilities) and perceptual;
- secrecy, coupled sometimes with an apparent unwillingness to give ‘straight answers’ (in part, perhaps, because of links to military nuclear operations in some countries, and in part because of commercial issues);
- the historical arrogance of many in the industry, dismissing opposition, however well-founded or sincerely held, as ‘irrational’;
- the apparent vested interest of many nuclear advocates, to be contrasted with the apparent altruism of opponents who, for example, are often not funded to take part in public inquiries;
- the perceived potential for large and uncontrollable accidents, and other environmental and health effects, notably those associated with radioactive waste;
- the overselling of nuclear technology, especially in its early days and in particular with regard to its economics, leading to a degree of disillusionment and distrust;
- a general disillusionment with science and technology, and with the ‘experts know best’ attitude of mind that was more prevalent in the years immediately after the Second World War;
- the wider decline of ‘deference’ towards ‘authority’ (including, for example, politicians and regulatory bodies).

Perceptions of negative public opinion, whether justified or not, can be extremely expensive for investors in nuclear power, and can even act as an absolute barrier. Opposition to the construction or operation of nuclear facilities could increase the costs of nuclear-generated electricity in a number of ways. There may be delays during construction or in achieving an initial operating licence, or interruptions in

operation. Extra physical or operational security measures might be demanded, for example, in response to a potential terrorist situation, even if there is no direct evidence of a threat. Implementing such measures may be especially costly if they involve 'backfitting' an existing design. The costs of site selection, evaluation and the licensing process itself can increase. The costs of transporting nuclear materials can escalate, because of increased requirements for security against protest, or the need to find new routes. The economic risk associated with uncertainty results in demands for higher rates of return on investment, an especially serious issue for highly capital-intensive technologies such as nuclear power.

In the most extreme cases, fears of public reaction can lead to a fully completed plant being refused an operating licence, or for a government to take steps to prevent nuclear construction or to close down existing facilities before the end of their technical lifetimes. Since 1978, for example, some 14GW of nuclear power plants, and one MOX fuel production plant, have been closed or halted in advanced stages of construction for non-economic reasons in six OECD countries (Austria, Germany, Italy, Spain, Sweden and the USA), some as a direct result of referenda. Germany, the Netherlands and Sweden have adopted formal phase-out policies by law, Switzerland has adopted a ten-year moratorium on new construction in 1990, and Belgium has taken a policy decision to phase out nuclear power. A number of countries which do not have operating nuclear power plants, such as Australia, Austria, Denmark, Greece, Ireland, Norway and Poland, have put in place legal or policy obstacles to nuclear power.

When it comes to considering the effect that public opinion has on decision-making, a further complication occurs. Decision-makers, naturally, will in part base their decisions on their perception of public opinion, in other words the perception of a perception. There is some evidence that these second-order perceptions may also be subject to some systematic errors.

Opinion polling carried out by MORI suggests an interesting pattern of perceptions about public perceptions among opinion formers and decision takers.

	Favourable towards nuclear energy industry	Unfavourable towards nuclear energy industry	Neither favourable nor unfavourable/ don't know
Public opinion	28 %	25 %	47 %
All MPs	43 %	44 %	13 %
MPs' perception of national public opinion	2 %	84 %	14 %

These data imply that, at least in the UK (though similar results have been found in the USA), the perception of public opinion among decision-makers may not be accurate, and therefore that the decisions being taken may be skewed by assumptions that may not be true. Possible reasons include the attitude of certain elements of the popular media, and the greater effectiveness of anti-nuclear pressure groups in organising letter-writing and other publicity campaigns.

Observations of this nature emphasise the need to explore and evaluate public views at an early stage in the decision-making process. This is the aim of some of the innovative techniques discussed later.

It seems clear that simply providing people with more factual information about nuclear power is not an effective way of building support. The ‘rationality’ of physical science and the rationality of everyday life can diverge quite radically. Churchill once said that when deciding what weight to put on a statement, he would first consider who was saying it, then how they were saying it, and finally what they were saying. In everyday life, most of us seem consistently to make up our minds about many matters based on whether we like and, especially, trust the messenger, rather than on critically examining the message. Dictation of policy by politicians or technocrats is no longer an option. The old ‘DAD’ model (decide-announce-defend) has been replaced by ‘DADA’ (decide-announce-defend-abandon).

### **New Approaches to Decision-Making**

In many developed countries, attempts are now being made to develop more democratic methods of decision-making, so that those affected have a genuine opportunity to change the course of major projects, and, in doing so, to share ‘ownership’ of the final decision and hence become more likely to accept it. There lies within nuclear technology something of a dilemma. The highly technical nature of much of the nuclear field would seem to suggest that decisions should be taken by those with suitable experience and qualifications. The social implications of nuclear technology, however, imply that a large number of individuals and interest groups should have an input to those decisions. Accommodating these two requirements into decision-making is a considerable challenge.

A number of trends have become apparent in many developed countries in recent years. There has been a marked decline in ‘deference’ – people are much less willing than once they were to accept the word of politicians, scientists or regulatory bodies on controversial issues. New methods of communication, notably the Internet, have made large amounts of information available to individuals who would not have had such ready access in the past. Most developed countries are becoming far more pluralistic, with a wider range of world views stemming, in part, from greater ethnic, cultural and religious diversity. In such circumstances, the scientific dispute over a particular proposal often acts as a proxy for deeper-seated disputes about equity, power relationships and decision-making processes.

Innovative decision-making techniques aim to be:

- *informed* - they seek an informed public viewpoint, not instant reactions;
- *deliberative* - they produce views reached through interactive group discussion;
- *independent* - they can be independent of the bodies concerned with a final decision;

- *inclusive* – they seek to involve a wide range of interested parties, including those who are sometimes disenfranchised or underrepresented by traditional approaches.

Some examples of techniques to engage with the wider public include:

- citizens’ juries;
- consensus conferences;
- interactive panels;
- deliberative opinion polls;
- research panels.

**Table 1 – Key Features of Innovative Techniques for Public Involvement**

	Number of people/ collective or individual view	Degree of deliberation	Local/ national	Duration/ cost	Written briefing	Cross-examine witnesses	Report
Citizens’ Juries	12-16 Collective	Low	Local	One-off/ Moderate	Yes	Yes	Yes-by jury
Consensus Conference	10-20 Collective	Very high	National	One-off/ High	Yes	Yes	Yes-by panel
Interactive Panels	12 Collective	Low	Local	Ongoing/ Moderate	Yes	No	Yes-by researchers
Deliberative Opinion Poll	250-600 Individual	High	Local/ National	One-off/ Very high	Yes	Yes	Yes-by organisers
Research Panels	500-5000 Collective or individual	Low	Local/ National	Ongoing/ Moderate	Yes	Potentially	Yes-by organisers

Attempts are now being made to evaluate the success of these techniques. Perhaps the sharpest unresolved issue is one of timescales, and the associated question of costs and who should bear them. There is suspicion among some commentators that the whole exercise is simply a delaying tactic, an attempt by those who oppose a particular technology or project to undermine its economics by introducing long delays during the planning, and possibly the regulatory, stages. This is of particular importance in competitive power markets.

There is a final point. In a pluralistic society there will never be complete agreement over major and controversial decisions such as the further development of nuclear power, or the strategy for dealing with radioactive waste. The final decision will require political leadership, and the decision-maker must be clearly accountable to the wider community, as well as to ‘stakeholders’. Some commentators have drawn a distinction between ‘consensus’, used in the sense of drawing in a wide range of interests and taking their views into account – a clearly positive exercise – and ‘consensus’ in the sense of allowing a wide range of minority groups consistently to prevent major decisions being taken, which is less clearly of benefit to society at large.