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PUBLIC OPINION ON ELECTRICITY OPTIONS

The 2007 Energy White Paper states that the UK needs an extra 40 to 45% of electricity generating capacity over the next 20 years. However, there is increasing debate about the proposed development of new power plants in the UK. Given recent public interest in new technologies it is important to understand this debate not just in a technological framework, but also within its social context. This POSTnote considers the social acceptability of different forms of electricity generation (mainly measured through opinion polls).

Background.

The 2003 Energy White Paper[1] set out four goals for UK energy policy. These were to:

- cut the UK's carbon dioxide emissions by 60% by "about" 2050 with "real progress" by 2020;
- maintain the reliability of energy supplies;
- promote competitive markets in the UK and beyond, helping to raise the rate of sustainable economic growth and to improve productivity;
- ensure that every home is adequately and affordably heated.

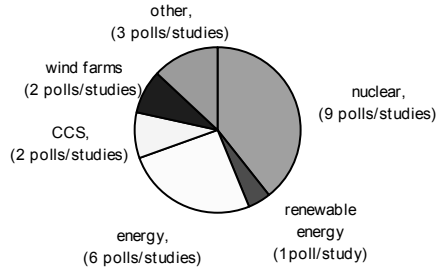
The subsequent 2007 White Paper[2] set out how the government intends to achieve these goals. While stating that saving energy is the most efficient means of cutting emissions, the Paper also emphasised the importance of developing "clean energy", not only for meeting emissions reduction targets but also for its contribution towards security of supply. Since many nuclear and coal fired power stations are due to close, and as electricity demand continues to grow, it is estimated that the UK will need between 30 and 35 GW of new generating capacity (roughly 40 to 45% of current capacity) over the next 20 years.

The 2007 White Paper stated that the government must set the framework for the market to invest in new generation, and that this must be done in such a way as to encourage a low carbon mix. Thus, while fossil fuels are acknowledged to have continued importance, renewable sources of energy are emphasised along with the possibility of investment in new nuclear build.

Public opinion

Public opinion is typically measured through opinion polls. If conducted using reliable methods, these are scientific and representative surveys, the results of which reflect the views of a particular group (such as the British public). There have been numerous opinion polls on the topic of energy generation published over the last few years. A selection of reputable polls[3], along with several academic and government studies (from 2004 – 2007) have been analysed for this POSTnote (23 in total)[4]. The central topics of these are shown in Figure 1.

Figure 1. Central Topics of the 23 Reviewed Polls and Studies



- "CCS" denotes Carbon Capture and Storage
- Examples of "Other" include Climate Change and Political Priorities

Given differences in methods, central topics and the wording of questions it is not possible to present definitive statistical results relating to public opinion.

Instead, this POSTnote will outline the key themes and patterns which emerged from analysing the data.[5]

While opinion polls may provide objective and trustworthy reflections of public opinion, there are many points to be taken into consideration when assessing the validity or merits of an individual poll (see Box 1).

Box 1. Assessing Opinion Poll Validity/Objectivity

- **Who conducted the poll?** While any polling firm may produce accurate results, polls conducted by well-established or reputed firms enable greater trust. For example, members of the British Polling Council (BPC) must subscribe to transparent methods, hence allowing for scrutiny by interested parties.
- **Who commissioned the poll?** The majority of polls carried out by polling organisations are commissioned by third parties – for example, a media body, private organisation or pressure group. The BPC advises that polls commissioned by the media are likely to be impartial, however care ought to be taken when the commissioner has a clear interest in the research.
- **Question wording and ordering.** It is important to examine closely how questions are worded and the order in which they are asked. The wording of questions can influence respondents to answer in certain ways, and equally, preceding questions may have an effect on how respondents interpret a following question.
- **Sampling.** It is important to consider both the sample size (number of respondents) and sampling method (how the respondents were selected). The majority of polls which aim to reflect the national population typically have a sample size of around 1000. It is better to have a smaller 'scientific' sample than a large 'non-scientific' one. A 'scientific' sample is one where, based on certain criteria, the respondents are selected by those conducting the poll in order to be representative of the relevant population. This can be done by simple random sampling with a large number of respondents, or through a quota which requires a certain number of respondents from different categories (for example, gender or age).
- **The dates of fieldwork.** This is important to understand the context of the poll, for example, if it took place before, after or during a significant event or development which related to the topic of the poll, responses may have changed or been influenced.
- **Method.** Polls are conducted by various different means, for example, face-to-face, over the telephone, by self-completion questionnaire or even on the Internet. This is an important consideration, since respondents might reply differently to different methods of questioning.
- **Weighting of Results.** If the overall sample does not accurately reflect the demographics of the wider population then the responses of individuals of under-represented groups will be 'weighted' to count for more than one respondent. Both the weighted and unweighted results should be available from the polling organisation.

Public opinion on energy options

Fossil fuels

About 90% of the UK's energy needs are currently met by fossil fuel sources (oil, gas and coal) and this is predicted to remain the case at least until the year 2020.

In terms of public opinion, the key findings were that:

- The public demonstrates a high level of awareness of the connection between fossil fuel sources of energy and environmental problems such as climate change.
- Fossil fuel sources of energy (and especially coal) were widely perceived to be 'dirty' sources of energy.
- There were very low levels of public support for the use of fossil fuels.
- There were high levels of concern about the possibility of using up finite resources.
- The most accepted or favoured fossil fuel source was natural gas, (it has been suggested that the use of the word 'natural' might have had an influence here).
- Security of supply is a key issue and of growing concern.

Renewable energy

In 2006, 4% of the UK's electricity came from "eligible" renewable sources as defined by the Renewables Obligation (RO, see Box 2). However, the government has set an ambitious target that 10% of UK electricity generation should come from such sources by 2010, and aspires to double this to 20% by 2020.

Box 2. The Renewables Obligation

Through the Renewables Obligation (RO), and (Renewables Obligation Scotland (ROS)) current energy policy places demands on electricity suppliers to supply a (growing) proportion of their electricity from renewable sources. The RO requires all licensed electricity suppliers in England and Wales to provide a designated proportion of their electricity from eligible renewable sources. This was 4.3 percent in 2003-04, rising to 10.4 percent in 2010-11 and 15.4% in 2015-16. The obligation is due to remain in place until 2027 and will continue to be raised up to 20% so that it always remains higher than actual generation levels.

Electricity suppliers receive Renewables Obligation Certificates (ROCs) (1 per MWh) for their eligible energy supply (these are presented to OFGEM). If a supplier fails to meet the target it can choose to buy ROCs from other suppliers with a surplus or alternatively pay the "buy-out" price (£34.30/MWh in 2007-08).

All the reviewed polls and studies showed that renewable energy was the public's preferred energy source. Where it was possible to choose between particular renewable technologies, polls showed a clear preference for solar energy.

Key findings were that:

- Technologies about which people were most aware were also the most favoured (for example, in several studies solar energy was the most well-known renewable technology and was consistently favoured).
- People were aware of the potential environmental benefits of renewable energy and recognised it as being important for climate change mitigation.
- People expressed support for the development of renewable energy.
- Typically around three quarters of respondents expressed a preference for renewables over nuclear energy.

Nuclear energy

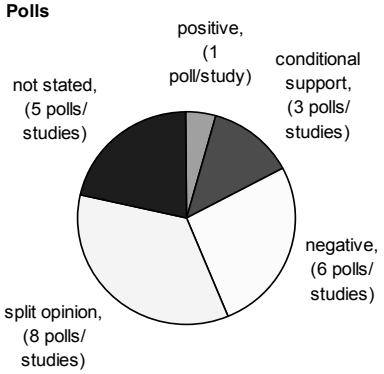
In 2006, 18% of UK electricity generation came from nuclear power. Approximately one-fifth of the UK's electricity needs were met by nuclear power over the last decade. However, all but one of the UK's nuclear power

stations are due to close by the year 2023. The possibility of investing in new nuclear power generation is considered within the 2007 White Paper where it is noted as being a low greenhouse gas (GHG) emissions technology.

The greatest number of studies and polls included in this analysis related centrally to nuclear power (Fig. 1). This may represent growing interest in the technology. Of those that focussed centrally on nuclear power, three were commissioned by the Nuclear Industry Association, and four by media sources.

In general, support for nuclear energy on its own was low, especially compared with renewable energy. Only one poll showed general overall support. However, this was a survey of MPs and not the general public. The greatest number of the reviewed studies and polls (8) demonstrated a split opinion, indicating that people are unsure about nuclear energy (see Fig. 2).

Figure 2. Overall Opinion about Nuclear Power as Expressed in the Total Selection of Studies and Polls



The key findings were that:

- When considered on its own people were negative about nuclear energy – but became more positive when it was considered in combination with other technologies, such as renewables or energy efficiency measures.
- The main concern relating to nuclear power was the creation of radioactive waste. The majority of respondents cited this factor as a key reason for their opposition to nuclear power.
- The public are divided about the safety of nuclear power. Polls reported roughly equal numbers of respondents believing that nuclear power posed unacceptable risks and those believing that nuclear power was safe.
- There is some confusion about nuclear power's impacts on the environment and climate change. For example, respondents appeared to be largely unaware that nuclear power was a low GHG emission technology.
- There is some evidence that support for nuclear power has increased over recent years, perhaps due to arguments relating to energy security and its reframing in terms of climate change mitigation. For example, some respondents indicated that they might support nuclear power if it would help mitigate climate change. However, renewable sources of energy were seen to be a better means of doing this.

Energy demand and efficiency

A significant trend to emerge from the data was the public's awareness of the need to make behavioural and lifestyle changes, to use energy more efficiently and to reduce energy demand. For example, a survey conducted in 2007 found that seven out of ten respondents felt they would need to change their energy consumption habits in the next ten years.

Carbon capture and storage

Two surveys focussed on carbon capture and storage (CCS) and both highlighted the low levels of awareness and understanding of the technology. One study conducted citizen panels in which participants were given more information about CCS and consequently became more favourable about it. However, participants also became concerned that if CCS were developed it might take emphasis off the need to reduce energy demand and as such delay more far-reaching and long-term changes. Therefore, support for CCS was conditional on it being part of a wider strategy for cutting emissions.[6]

Issues

This research highlights many different issues which are relevant not only for those concerned with science and technology, but also issues of governance.

Limitations of polls

Responses which are given within opinion polls depend on the questions which are asked (i.e. how they are worded and in what context). Equally, asking respondents to choose between categories (for example, do you prefer nuclear power *or* renewables?) and using closed questions serves to conceal the complexities of, and reasons behind, public opinion. The public are said to want a diverse mix of energy sources, and to be more accepting of particular technologies as part of a package, rather than as a single source of energy. To highlight such factors, more flexible methods of assessing public opinion are more appropriate (for example deliberative events, focus groups or citizen panels[7]).

Awareness of technologies

There is debate about the effect that increased awareness has on opinion of technologies. Many studies have indicated a positive association between levels of awareness about particular technologies and support for the technology, (for instance, solar power was a preferred technology and also one which most people had heard of). However, this is in contrast to the often cited argument that in many instances people become more critical as their knowledge of a technology increases.

Attitudes towards nuclear energy

Support for nuclear power, where it existed, was highly conditional. In one study, respondents who were accepting of the possibility of new nuclear build were described as demonstrating 'reluctant acceptance'[8]. The Sustainable Development Commission commented that favourable impressions of nuclear power are dependent on it being one of a *mix* of energy generation sources. This is supported by a poll by YouGov in 2006 on behalf

of *The Economist*. It showed that while only 40% of respondents supported building more nuclear power stations, 68% agreed with the statement; "If necessary, I would support more nuclear power stations, if it were part of a wider strategy that also included other kinds of 'clean' energy such as solar power and wind farms".

The social dimension

Technical knowledge is not the only factor which influences public opinion about particular technologies. Other factors include judgements of the trustworthiness of institutions, official bodies and industries making claims about the technology. Perceptions are thus based on social as well as technical considerations. This is seen to be an important consideration for the nuclear industry which has been the subject of public scepticism and low trust.

Not in My Backyard (NIMBY)

There is some scepticism about the reportedly high levels of support for renewable energy, given the difficulties encountered in gaining planning approval for some developments. There is much discussion of this in terms of NIMBY-*ism* (Not-In-My-BackYard) which suggests that people will support the abstract concept of renewable energy but tend to oppose it when it would affect them or their lifestyles (for example if a wind farm was proposed on land near their home). This is the subject of considerable debate and much of the related academic literature has attempted to discredit the NIMBY concept. For example, it has been argued that people living close to or having direct experience of wind power developments tend to view them positively.

Although there was contradictory evidence in the polls, it has been suggested that NIMBY-*ism* is not an issue for nuclear power since local communities are typically very positive about existing local nuclear power plants, and since (at least early) new nuclear stations are very likely be built on or near the same sites as existing ones.

Personal action

The polls and studies suggested a widespread desire for measures focussed on energy efficiency and demand reduction. The need for meaningful long term changes (especially lifestyle and behavioural changes) was stressed. One study[9] suggested that this highlights the desirability of a public and policy debate focussing on ways to achieve carbon management at the individual and household level.

While there is recognition of the need for lifestyle changes, individual willingness to make these changes or to pay for them is not so evident. Two polls conducted in 2006[10] found that although respondents were supportive of increasing taxes on industry or businesses which emitted high levels of GHG emissions, they were not supportive of similar taxes directed at individuals or households. It has been suggested that without a clear and strong lead by the state, individual members of the public will have no incentive to partake in energy efficiency or consumption reduction activities.

The relevance of public opinion

The importance of considering public opinion on policies relating to science and technology has been well highlighted in recent years, for example by the public backlash against GM crops, or the opposition sometimes expressed towards wind power planning applications. Moreover, the court case won against the government by Greenpeace regarding the 2006 nuclear power consultation demonstrated the need to engage with and reflect wider society's views about energy options.

Overview

- Renewable sources of energy are the preferred means of energy generation, but a diverse mix of energy sources is wanted.
- The public is concerned about security of supply and the environmental effects of relying on fossil fuel sources.
- There is split opinion about nuclear power, and a desire for more information.
- The public feels that attention should be focussed on demand reduction and energy efficiency, rather than energy production.
- However, without clear incentives or a strong lead by the state, people's willingness to make significant changes or sacrifices appears to be limited.

Endnotes

1 DTI, 2003, *Energy White Paper: Our Energy Future – Creating a Low Carbon Economy.*
2 DTI, 2007, *Energy White Paper: Meeting the Energy Challenge*
3 Polls were judged to be reputable if they were conducted by established and well-known organisations (for example; Ipsos MORI, ICM, YouGov ,NOP or Eurobarometer).
4 A full list of polls and studies is available in the electronic version of this POSTnote at www.parliament.uk/parliamentary_offices/post/pubs2007.cfm.
5 A more detailed study of opinion polls and surveys relating to energy is provided in F. McGowan & R. Sauter, 2005, *Public Opinion on Energy Research* SPRU on behalf of RCUK.
6 Shackley, S., McLachlan, C. & Gough, C., 2004, *The Public Perceptions of Carbon Capture and Storage* Tyndall Centre.
7 For a discussion of these approaches see POST, 2001, *Open Channels* POST Report.
8 Poortinga,W., Pidgeon, N. & Lorenzoni, I., 2006, *Public Perceptions of Nuclear Power, Climate Change and Energy Options in Britain* Tyndall Centre.
9 Poortinga *et al* (as above).
10 YouGov on behalf of *The Economist* and YouGov on behalf of *The Daily Telegraph.*

POST is an office of both Houses of Parliament, charged with providing independent and balanced analysis of public policy issues that have a basis in science and technology.

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