

Public Perceptions of Nuclear Power, Climate Change and Energy Options in Britain: Summary Findings of a Survey Conducted during October and November 2005

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Introduction and Policy Background

This report presents the findings of a comprehensive empirical survey of public opinion towards future energy options for the UK, with a particular emphasis on attitudes towards nuclear power when placed in the context of climate change.

The international community has become increasingly aware that action is needed to address the profound and unavoidable threats posed by climate change. The UK is committed to a 12.5% cut in the six main greenhouse gas emissions by 2012 and is just about on course to achieve this.¹ In addition, the British Government has set the more ambitious domestic 'aspiration' to achieve a 60% reduction of UK carbon dioxide emissions (CO₂) by 2050 as compared to 1990 levels.² The UK government is also taking an international lead in promoting intergovernmental responses at the highest political levels.

Against the climate policy background of an increasing need to meet domestic CO₂ reduction aspirations, the UK is witnessing a new line in political debate around the build of new nuclear energy generation capacity. Future development of the nuclear power sector is increasingly being constructed, by a range of advisors to government and by scientists, within a prognostic policy frame that is shaped by the need for energy security, for a reliable base load of electricity and for reducing CO₂ emissions. In other words the energy policy debate is being *reframed* in terms of security and reliability of future energy supplies, and as a part of the solution to the problem of climate change mitigation.³

Currently, it has been estimated that the UK's existing stock of 12 nuclear power stations (housing 23 operating reactors⁴) reduces national carbon emissions by between 7 and 14%.⁵ Plans for future decommissioning of power stations, as they reach the end of their life, mean that by 2025 nuclear capacity will have reduced to a single station.

We know from longstanding research on public perceptions of risk that 'nuclear power' and 'radioactive waste' both invoke highly negative connotations for people, while work on perceptions of climate change also shows this is a significant concern, albeit a highly complex and sometimes distant one in people's minds (see Slovic, 2000; Poortinga and Pidgeon, 2003a; Lorenzoni and Pidgeon, 2006). However, almost nothing is known about how ordinary citizens will respond to the current policy reframing of these issues around the arguments that link nuclear energy to climate change threats, energy reliability and wider sustainability objectives. A recent reanalysis of data linking the issues of climate change and radioactive waste from a national comparative survey and focus groups, that we obtained in 2002 (Bickerstaff et al., 2006)⁶, shows that people do interpret nuclear energy in a different way when it is positioned alongside

¹ For example, Department for Environment, Food and Rural Affairs (DEFRA) (2005) *Emissions of greenhouse gases 1990-2012, United Kingdom*, <http://www.defra.gov.uk/environment/statistics/globalatmos/kf/gakf05.htm> retrieved May 20, 2005. See also analysis by the Institute for Public Policy Research (2005) which suggests that only the UK and Sweden are on course to achieve their Kyoto targets (<http://www.ippr.org.uk/pressreleases/?id=1863>, retrieved January 5, 2006).

² Department of Trade and Industry (DTI), Department for Transport (DfT) and Department for Environment, Food and Rural Affairs (DEFRA) (2003) *Energy White Paper: Our energy future – creating a low carbon economy*, Norwich: TSO.

³ See Sir David King, 'The nuclear option isn't political expediency but scientific necessity', *The Guardian*, Friday December 16, 2005. The BBC even offers a short guide to the pros and cons of nuclear power as part of a solution to climate change, see http://www.bbc.co.uk/climate/adaptation/nuclear_power.shtml.

⁴ Nuclear Industry Association (2005) *Nuclear – climate friendly energy*, retrieved 17 October 2005, from http://www.niauk.org/article_26.shtml

⁵ Department of Trade and Industry (DTI) (2003) *Nuclear power generation development and the UK industry*, retrieved April 4, 2005, from <http://www.dti.gov.uk/energy/nuclear/technology/history.shtml>

⁶ The 2002 research involved a major national survey of public perceptions of the risks and benefits, as well as attitudes towards science and scientists, with respect to five risk cases including climate change and radioactive waste conducted for us by MORI (see Poortinga and Pidgeon, 2003a), as well as a series of 4 'double' focus groups (each group comprised two evening sessions) where participants discussed first climate change and then radioactive waste, finally leading on at the very end to a deliberation about the potential risk-risk trade-off between the two (Bickerstaff et al., 2006).

climate change. In effect, people in the focus groups became more ambivalent and less antagonistic about nuclear power as an energy source. Despite this, few of our participants actively and wholeheartedly supported climate change mitigation through new nuclear build as an acceptable policy position. However, a greater number did arrive at the conclusion, usually after some debate, that there was little or no choice. In effect, pursuing the nuclear option was judged by many in the groups as the lesser of two evils. This discourse, of what we have termed a 'reluctant acceptance'⁷ was a common response to the explicit reframing of nuclear power in terms of climate change mitigation: indeed, many in the groups actively *resisted* this risk-risk tradeoff, and the positioning of the problem implied by it.

Accordingly, this new survey's main objective is to build upon the earlier focus group and survey research, by gaining an understanding of how a representative sample of people in Britain might respond to the current policy reframing of nuclear energy within a debate about climate change mitigation and energy futures.

The survey questionnaire was organised into 4 main sections:

- The first main section explores responses to climate change and nuclear power alongside a range of other environmental and energy-related issues, and people's attitudes towards various options for generating electricity.
- The second and third sections consider a range of detailed opinions and attitudes towards nuclear power and climate change respectively. For each issue this includes questions upon importance, perceived risks and benefits, acceptability of future options, and trust in policy makers.
- The final section of the questionnaire looks specifically at attitudes towards the reframing of nuclear power as one potential response to climate change, and specifically introduces a split-sample technique to present (on roughly one half of the sample) one argument for, and one argument against building new nuclear power stations - positioning nuclear power as a solution (or not) to climate change. This half of the sample was then asked how strongly they agreed or disagreed with a series of statements. The other half or so of the sample was not presented these arguments but still asked (without any pre-amble) to what extent they agreed or disagreed with the same series of statements.

We conclude this report with a number of key findings. A copy of the full questionnaire used, marked up with the raw Topline findings from MORI, is included as an Appendix to this summary report.

⁷ See also the outcomes of deliberative research conducted as part of the 2002 energy review, which point to rather similar conclusions: *Integrated Public and Stakeholder Consultation to Inform the Energy White Paper*, 2002, DTI See http://www.dti.gov.uk/energy/developpep/pub_con_rep.shtml accessed 16 December 2005.

The Survey

Procedure and Respondents

Interviews for this study were conducted between 1 October and 6 November 2005. A quantitative survey was undertaken in Great Britain (England, Scotland, and Wales) by the market and opinion research company MORI. A national representative quota sample of 1,491 people aged 15 years and older was interviewed face-to-face in their own homes⁸. The characteristics of the UEA/MORI Energy Survey 2005 sample are presented in Table 1.

Table 1. Characteristics of the 2005 Survey Sample (%)

Characteristic		%	Characteristic		%
Gender	Male	48	Level of Education	No formal	22
	Female	52		GCSE	23
Age	15-24	15		Vocational/ NVQ	10
				A level	13
	25-34	16	Bachelor degree	17	
	35-44	19	Postgraduate	5	
	45-54	16	Other/ Don't know	6	
	55-64	14			
	65-74	10	Employment	Full-time	44
75 and older	9	Status	Part-time	13	
			Unemployed	3	
Class	AB	24	Retired	24	
	C1	29	Student	6	
	C2	21	Looking after	7	
	DE	25	house/children		

⁸ The interviews were carried out using fully trained and supervised market and opinion research interviewers and took on average about 32 minutes to complete. Interviews were conducted at 257 sample points comprising 1 Super Output Area (i.e. 1 pair of adjacent Output Areas). The sample points were selected randomly from a stratified sample of output areas sorted by Government Office and council area. Output Areas with a low number of addresses (<80 postal address files) were excluded, as were any non-residential area (e.g. hospitals, prisons, and college accommodation). Interviewers approached selected addresses within the sample points until they reached the quotas for gender (Male, Female), age (15-24, 25-34, 35-54, 55+), and working status (Working Full-time, Not Working Full-time). Quotas were devised from the 2001 Census and subsequent ONS data. Interviewers were instructed to leave at least three addresses between each call. A maximum of one interview per address was conducted. No incentives were offered to respondents. To adjust for any variance in the quotas or coverage of individual sampling points, the results were weighted to the population profile of Great Britain by 5 sets of simple and interlocking rim weights for social grade, standard region, unemployment within region, and age and working status within gender. The findings from the overall sample of 1,491 are accurate to within +/- 2.5% (95 times out of 100). Findings from smaller samples (e.g. from the sub-groups) will have wider margins of error around them. For example, a sub-group of 100 respondents will have findings accurate to within +/- 10% (95 times out of 100).

				Disabled/invalid	2
				Other	*
Ethnic	White	90			
Background	Asian	3	Number of	None	64
	Black	2	Children	1	16
	Mixed	1		2	11
	Other	*		3 or more	7
	Not stated	2			

Source: UEA/MORI Energy Survey 2005 (Weighted dataset, N =1,491).

The Questionnaire

The questionnaire consisted of 4 main sections. The first main section looks at climate change and nuclear power from a broad perspective, comparing these two with a range of other environmental and energy-related issues at different global / local scales. This section also examines attitudes towards various options for generating electricity. The second section specifically considers attitudes towards nuclear power. The third section examines attitudes towards climate change in more detail. Both sections contain a number of standardised questions that were aimed to measure general attitudes towards nuclear power and climate change, the perceived risks and benefits of the two issues, as well as questions on ambivalence, attitudinal certainty, and trust in risk regulation. In addition, the two sections contain a number of issue-specific questions. The fourth and final section of the questionnaire looks specifically at attitudes towards the reframing of nuclear power as a solution to climate change. This section contains questions that were designed to compare the risks of climate change with the risks of nuclear power, and attitudes towards different energy futures and options of electricity generation that might help to prevent climate change, referring to the split-sample mentioned earlier. The specific questions and Topline findings are reported in Appendix A.

Although there are a range of one-off or tracker surveys and risk perception studies available that have asked about energy generation, nuclear energy, and climate change separately, the value of the current instrument is that it generates a database which allows responses to be compared across all 3 sets of issues. In addition there is no comparable existing survey which asks, in a comprehensive way, about the repositioning question.

Findings

Section 1: Attitudes Towards Electricity Generation

Putting concern about nuclear power and climate change in context

Controversial issues invariably surface in a society that already has to deal with numerous other questions, with which they have to 'compete' for attention. To contextualise issues related to energy generation and consumption, respondents were first asked to indicate their concern about 17 environmental and energy issues, including nuclear power and climate change / global warming, other global and local environmental issues. These data⁹ show that.

- Currently, climate change / global warming is a much *higher* concern for people than is nuclear power. Specifically, 82% of respondents were very or fairly concerned about the former compared to only 58% very or fairly concerned about the latter.
- People were also far *more concerned* about radioactive waste (80% very or fairly concerned) than they were about nuclear power.
- Interestingly, respondents also showed levels of concern about using up energy resources that are not replaceable, such as oil and coal (83% very or fairly concerned about this issue).
- The issue prompting highest concern was pollution of rivers and lakes and seas (92% very or fairly concerned), while the lowest was lack of access to parks/green spaces (56%).

Interest

Not only were people more concerned about climate change than about nuclear power, they were also more interested.¹⁰ Fully 81% were very or fairly interested about this issue, compared to that of nuclear power where only 64% were very or fairly interested.¹¹

General impressions of current options for electricity generation

Previous research suggests that opinions towards different energy options differ markedly, with a greater preference amongst ordinary people for renewable over other sources.¹² Our data show a similar general pattern. We asked a general 'impression' question to gain overall views of eight different sources (biomass, coal, gas, hydroelectric, nuclear, oil, solar, wind), as follows:

⁹ Appendix Topline Q1.

¹⁰ These findings support other recent survey data – the 2002 UEA / MORI survey of five risk cases indicated that 76% of respondents were very or fairly interested in climate change; a DEFRA survey of 2001 also showed that 80% of respondents were very or fairly worried about climate change (DEFRA, 2002).

¹¹ Appendix Topline Q2.

¹² See McGowan, F. and Sauter, R. (2005) *Public Opinion on Energy Research: Desk Study for the Research Councils*. Sussex Energy Group, SPRU: University of Sussex.

*How favourable or unfavourable are your overall opinions or impressions of the following energy sources for producing electricity currently?*¹³

- When asked about *impressions*, renewable sources were seen as much more favourable than conventional fossil fuels, while nuclear power comes last in the ranking of ‘favourableness’.
 - In particular 87% had a very or mainly favourable impression of sun/solar power, 82% of wind power, and 76% of hydroelectric power.
 - By contrast only 56% were very or mainly favourable about gas, 38% about coal, and 39% about oil.
 - Only 35% were very or mainly favourable about nuclear power.
- Just under one fifth of the sample answered ‘Never heard of’ or ‘Don’t know’ to biomass. This is not a particularly surprising result, given the relatively low media profile of biomass sources, and confirms other survey findings.¹⁴

Beliefs about future options for electricity generation

We then asked a more policy-oriented question regarding what people felt was the *future contribution* of the same eight energy sources for electricity generation, as follows.

*To what extent do you agree or disagree that the following energy sources will make a substantial contribution to reliable and secure supplies of electricity in Britain in the future?*¹⁵

- With respect to this *future options* question, a slightly different picture appears, with nuclear power now gaining a ranking above coal and oil and one comparable with gas.
 - Here people feel that sun/solar (78% agree or strongly agree), wind power (78%) and hydroelectric (69%) will make a substantial contribution to reliable and secure supplies of electricity in the future.
 - Around half (49%) of adults agree or strongly agree that nuclear energy will make a substantial contribution to reliable and secure supplies of electricity in the future.
 - And with regards to fossil fuels, 49% of adults (gas), 33% (coal) and 39% (oil) agree or strongly agree that these energy sources will make a substantial contribution to secure supplies of electricity in the future.

The survey also asks about the most important factors which should be taken into account for deciding which methods of electricity production should be used in Britain in the future.¹⁶

- Here people felt that health and environmental issues were the most important factors to be taken into account, while the issues of cost, safety, reliability and security were chosen less often by respondents.

¹³ Appendix Topline Q3.

¹⁴ McGowan, F. and Sauter, R. (2005) op cit.

¹⁵ Appendix Topline Q4

¹⁶ Appendix Topline Q6.

How people view wind, coal and nuclear generation

We also know from past research that people do differentiate various electricity generation sources in terms of their (generally positive and negative) factors. Accordingly Table 2 presents a synopsis of 3 questions on the survey¹⁷, which ask about attitudes to nuclear power, coal power and wind power in greater detail.

Summarising some of the most important points from the data presented in Table 2:

- The general stigma, which we know is invariably attached to nuclear power, remains. Many respondents think that it creates dangerous waste (84% agree or strongly agree) and is a hazard to human health (70%). Very few respondents agree that it is safe (only 18% tend to agree or strongly agree) or good for communities living nearby (11%). Set against this, some 41% tend to agree or strongly agree that nuclear power is clean.
- Fully 90% of the respondents tend to agree or strongly agree that wind power is clean. It is also seen by many as being safe (87%), good for the economy (67%) and cheap (58%).
- Coal power generation is correctly thought to cause air pollution (79%) and climate change (64%), while few people think it is clean (9%) or good for communities living nearby (16%).
- A significant proportion (39%) of adults also agree or strongly agree that nuclear power causes climate change, indicating the possibility that claims that nuclear power can effectively contribute towards tackling this issue might be met with scepticism by some people who hold this view firmly as a prior belief.

Table 2. To what extent do you agree or disagree that generating electricity from coal/nuclear power/wind power... (% tend to agree and strongly agree aggregated)

	Coal	Nuclear	Wind
...causes air pollution	79%	36%	4%
...causes climate change	64%	39%	5%
...creates dangerous waste	39%	84%	3%
...is a hazard to human health	51%	70%	4%
...is inefficient	36%	16%	24%
...spoils the landscape	57%	44%	43%
...is cheap	35%	28%	58%
...is clean	9%	41%	90%
...is good for communities living nearby	16%	11%	40%
...is good for the economy	35%	41%	67%
...is reliable	57%	54%	50%
...is safe	48%	18%	87%

Source: UEA/MORI Energy Survey 2005 (Weighted dataset, n=1,491)

¹⁷ Appendix Topline Q7, Q8, Q9.

Energy options and preventing climate change

We also asked, in the later section about climate change, about the extent to which the eight electricity generation options can help to prevent climate change.¹⁸ The results are in line with those for the three options (coal, wind, nuclear) discussed above:

- The majority of respondents either strongly agree or tend to agree that renewable sources of electricity (such as wind and solar) can help prevent climate change (i.e. 85% solar power; 85% wind power; and 71% hydroelectric power).
- Overall, only 37% of respondents either strongly agree or tend to agree that electricity generated from nuclear power could help prevent climate change, while 36% disagree with this statement.
- Far fewer respondents identify fossil fuel energy sources as contributors towards climate change mitigation (i.e. only 16% for coal; 23% for gas, and 14% for oil respectively).

Preferences for nuclear power versus renewable sources

Respondents were asked to consider which energy option they would prefer if the costs of supplying the UK's energy needs were the same from either nuclear power or renewable energy sources (such as solar and wind power) respectively.¹⁹ Although this question is somewhat hypothetical, given the uncertainties associated with establishing different costs of these options, the results of this question were clear-cut, with a very strong preference for renewable sources over nuclear power.

- More than half (60%) indicated they would much prefer renewable energy sources while a further 17% would slightly prefer renewable energy sources.
- Only 8% would slightly or much prefer nuclear power over renewable sources.
- These results show an increase of five points in those who would slightly prefer renewable energy sources, compared to the results obtained in the same question asked by MORI for Greenpeace 2002. However, the percentage who indicate they would much prefer renewable energy sources (60%) has not altered at all.

¹⁸ Appendix Topline Q25.

¹⁹ Appendix Topline Q26.

Section 2: Attitudes Towards Nuclear Power

General attitudes, risks and benefits of nuclear power

Attitudes towards the acceptability of risk issues are often driven by more deep-seated beliefs (feelings) as well as judgements about the relative balance between risks and benefits.

- 37% of respondents felt very or fairly negative about nuclear power. By contrast, 32% were fairly or very positive about this issue.²⁰
- Fully 72% either agree or strongly agree that there are risks to people in Britain from nuclear power.²¹
- While 49% agree or strongly agree that there are benefits to people in Britain from nuclear power.²²

Similar responses emerged from items to another question which provided opinion statements on nuclear power²³, for example:

- Overall, fewer people strongly agree or tend to agree that “there are a lot of good things about nuclear power” (41%) than those who strongly agree or tend to agree that “there are a lot of bad things about nuclear power” (56%).
- In balancing risks and benefits, 41% feel the risks of nuclear power far or slightly outweigh the benefits, while 32% feel that benefits far or slightly outweigh the risks.²⁴

The data on feelings, and risks and benefits, therefore presents a fairly evenly balanced picture, despite the fact that many in the survey are concerned about the risks of this technology (as we know from previous research).

Strength of opinion

Many respondents did feel they had an opinion about nuclear power²⁵:

- 67% tend to disagree or strongly disagree with the statement “I am not that bothered about nuclear power”.
- While, 47% strongly agree or tend to agree that they had strong opinions about nuclear power.
- However, 56% still indicated they had “mixed feelings about nuclear power” with 67% also indicating they strongly agree or tend to agree with the statement that “I need more information to form a clear opinion about nuclear power”.

Public involvement in debate

Regarding public engagement, only 39% strongly agree or tend to agree that they would be prepared to take part in a public discussion or hearing about nuclear power.

²⁰ Appendix Topline Q5.

²¹ Appendix Topline Q 13.

²² Appendix Topline Q 13.

²³ Appendix Topline Q13 and Q15.

²⁴ Appendix Topline Q10.

²⁵ Appendix Topline Q13.

Views on nuclear power as a source of electricity in the future

The survey was designed to explore people's preferences regarding the role and capacity of nuclear power as a potential source of electricity for the future, and a number of questions on the survey address this issue.

In one question, people were asked directly:

"To what extent do you support or oppose the building of new nuclear power stations in Britain to replace those being phased out over the next few years? This would ensure that the same proportion of nuclear energy is retained".²⁶

- Our survey indicates that a smaller proportion tend to support or strongly support replacement build (33%) than those who tend to oppose or strongly oppose replacement (43%).

Although question wordings and questionnaire structure differed in each case²⁷, the above findings are generally in line with similar results from surveys MORI have conducted for BNFL and EDF over the last 4 years, showing a gradual lessening in opposition, over the period 2001-2004, to the replacement of British nuclear power stations (see Knight, 2005). Our findings still suggest, however, more opposition than support for replacement

However, in response to a subsequent question²⁸, asking respondents to select between four different future options:

- The same proportion of respondents (34%) were of the opinion that "we should continue using the existing nuclear power stations, *and replace them with new ones* when they reach the end of their life" as thought that "we should continue using the existing nuclear power stations, *but not replace them with new ones* when they reach the end of their life" [our emphasis added].
- Only 9% maintained that the number of nuclear power stations should be increased, while 15% were of the view that all existing power stations should be shut down now and not replaced with new build.

Overall, a higher proportion of respondents, when asked directly²⁹ about the more general notion of nuclear power, indicated that they opposed nuclear power (37%) vs. those who supported it (26%); while 32% were ambivalent, stating they were not sure whether they supported or opposed nuclear power in Britain today.

²⁶ Appendix Topline Q11.

²⁷ In particular the BNFL/MORI series used the phrase 'to what extent would you ...', whereas we used 'do you...'. Also the BNFL/MORI series used a smaller, and different, overall question set.

²⁸ Appendix Topline Q14.

²⁹ Appendix Topline Q12.

Trust in managing nuclear power

Research to date suggests that perceptions of risk are related to the confidence placed in actors considered to be responsible for managing that risk (e.g. Renn and Levine, 1991; Johnson, 1999; Poortinga and Pidgeon, 2003b). Thus, the survey explores people's confidence in³⁰:

- Government:
 - Overall opinion was ambivalent regarding whether “current rules and regulations in Britain are sufficient to control nuclear power”: 32% strongly agree or tend to agree with this statement, while 26% strongly disagree or tend to disagree. Similarly, while 33% of respondents strongly agree or tend to agree with the statement “I feel confident that the British government adequately regulates nuclear power”, 33% strongly disagree or tend to disagree.
 - A significant proportion (41%) of people strongly agree or tend to agree that “the government is too influenced by the nuclear industry regarding nuclear power” (note, however, that 31% neither agree nor disagree with this statement).

- Industry:
 - A significant proportion (39%) of people strongly agree or tend to agree that they did not trust the nuclear industry to run power stations safely (note, however, that 24% neither agree or disagree with this statement) while a similar number (41%) strongly agree or tend to agree that the “British nuclear industry can be justifiably proud of its safety record”.

³⁰ Appendix Topline Q15.

Section 3: Attitudes Towards Climate Change

Previous surveys and qualitative research in both Europe and the USA have found widespread interest and concern about climate change, accompanied by somewhat less knowledge about the precise causes of, and possible solutions to, climate change.³¹ The data in the current survey show a similar pattern of responses.

Beliefs about climate change and its causes

Effective government and individual action on climate change is unlikely if people are not convinced of the case for such action. However:

- The overwhelming majority of respondents (91%)³² did indeed believe that the world's climate is changing.

We also asked, in an open-response question to all those who thought the world's climate was changing, what might be causing this.³³ Here:

- The most popular response (mentioned by 39% of those who thought the world's climate was changing) was the very general notion of 'air pollution' as a cause of climate change.
- Many could, however, correctly identify the main human causes of climate change: 31% mentioned transport (including cars and planes), 29% mentioned burning of fossil fuels, 19% mentioned industrial emissions, 15% referred to carbon dioxide, and 15% deforestation.
- Congruent with previous research findings³⁴, some also referred to loss of the ozone layer (19%) and nuclear power (5%) as causes of climate change.

General attitudes, risks and benefits

As noted above with nuclear power, attitudes are often driven by more deep-seated beliefs (feelings) as well as judgements about the relative balance between risks and benefits.

- More than half of respondents felt very or fairly negative about climate change (56%).
- Fully 77% either agree or strongly agree that there are risks to people in Britain from climate change.³⁵
- Only 13% agree or strongly agree that there are benefits to people in Britain from climate change.
- In balancing risks and benefits, 44% felt the risks of climate change far outweigh the benefits, while only 4% felt that benefits far outweighed risks.³⁶

Comparing these results with those for the similar questions for nuclear power (Section 2 above), we see that climate change is viewed in a far more consistently 'negative' light than nuclear power is. That is, few people see climate change as holding benefits and many see it as posing risks, with the former typically outweighing the latter.

Strength of opinion

Respondents' strength of opinion on climate change was also elicited.³⁷

³¹ Lorenzoni *et al.* (2005) and also Lorenzoni and Pidgeon (2006).

³² Appendix Topline Q16.

³³ Appendix Topline Q17.

³⁴ See Lorenzoni and Pidgeon (2006).

³⁵ Appendix Topline Q22.

³⁶ Appendix Topline Q19.

- 77% tend to disagree or strongly disagree with the statement “I am not that bothered about climate change”.
- 59% strongly agree or tend to agree that they have strong opinions about climate change.
- 41% of people indicated they had “mixed feelings about climate change” with 62% also indicating they strongly agree or tend to agree with the statement that “I need more information to form a clear opinion about climate change”.

Compared with respondents’ opinions about nuclear power (see section 2), the general pattern is that people tend to express slightly stronger and firmer views on climate change.

Public involvement in debate

Opinions are evenly distributed regarding the preparedness to participate in a public discussion or hearing about climate change.³⁸

- 42% agree or strongly agree they would be prepared to take part in a public discussion or hearing about climate change while 39% disagree or strongly disagree with this statement.

Preferences for action

We wished to gauge people’s preferences for action against climate change. In a direct question about whether anything should be done³⁹:

- A clear majority of respondents (62%) indicated that *every possible action* should be taken about climate change, whilst a further 32% indicated that some action should be taken against climate change. Perhaps surprisingly, only 3% felt no action should be taken.

We also asked respondents to choose from a list of possible actions for tackling climate change, up to three which they thought would best tackle climate change⁴⁰.

- Expanding nuclear power was chosen by only 14% of the sample, while continuing fossil fuels with carbon capture and storage by only 12%.
- A much larger proportion of respondents suggested that the best way to tackle climate change would be to manage demand through behavioural change (69%).
- The second and third most common responses were to increase the use of renewable sources (68%) and to expand the use of energy-efficiency technologies (54%).
- Regulation and taxation to reduce consumption was far less popular (12%).

These data are especially interesting because they indicate not only a lack of preference for nuclear power as a main solution to climate change, but also because they open up the possibility for a wider debate on ‘carbon management’ at the individual or household level.

³⁷ Appendix Topline Q22.

³⁸ Appendix Topline Q22.

³⁹ Appendix Topline Q20.

⁴⁰ Appendix Topline Q21.

Attribution of responsibility, regulation and trust

The survey asked who should be mainly responsible for taking action against climate change.

- Most respondents attributed responsibility for change at the global (32%) and national (39%)⁴¹ levels, which is consistent with many other surveys.⁴² Responsibility is perceived to lie, very marginally, with individuals and families (8%) or environmental groups (4%).

These responses may hint at a pragmatic attitude, with which people may be approaching this question. Other quantitative and qualitative research has suggested that whilst acknowledging their own moral contribution towards climate change and duty to address this, people generally feel they are not able to engage in behavioural change unless enabled to do so by institutions with wide ranging powers (Bickerstaff *et al.*, 2006). Another explanation may be that most individuals feel climate change as a global problem may require concerted action first and foremost instigated and driven at national and international scales.

Additionally⁴³:

- Over half of the respondents (57%) disagree that the current rules and regulations are sufficient to address climate change, while only 14% felt confident that the British Government adequately tackles climate change. A majority of respondents (52%) also agree that climate change would happen regardless of how electricity was generated in Britain.⁴⁴ Perhaps this could also be interpreted in terms of a negative attitude towards current debates about electricity generation and the uptake of CO₂ neutral options in the future.

⁴¹ Appendix Topline Q23.

⁴² DEFRA (2002); Norton and Leaman (2004).

⁴³ Appendix Topline Q24.

⁴⁴ Scientific thinking indeed concurs that the effects of current mitigation efforts will be evident only on medium to long timescales, due to the timelag of greenhouse gases in the atmosphere from past emissions.

Section 4: Framing Nuclear Power as a ‘Solution’ to Climate Change

Towards the end of the survey (at Q. 27), a range of questions was asked, specifically designed to examine how members of the public might be responding to the current policy reframing of nuclear power in terms of climate change mitigation. Frames can be considered as central organizing ideas or reference points for structuring and making sense of relevant events, for instance identifying a problem or articulating a proposed solution to that problem – including the strategies for carrying out the plan (Gamson and Modigliani, 1989; Benford and Snow, 2000).

We also introduced a split-sample technique, such that just over half the respondents in the sample⁴⁵ were presented with a statement outlining one argument for and one against building new nuclear power stations in the UK, set within the context of climate change mitigation:

The UK currently has 12 nuclear power stations⁴⁶, which provide nearly a quarter of our electricity. Over the next 20 years most of these will close, as they reach the end of their lives. When thinking about whether or not to build new nuclear power stations to replace them, the Government needs to consider a number of things. These include: the cost, the waste produced, health, the risk of accidents, and the UK's dependency on importing fuels from other countries, our electricity consumption and the effect on climate change.

As you may know, one argument for building new nuclear power stations is that they would help prevent climate change by not emitting carbon dioxide when generating electricity, unlike coal or gas-fired power stations. One argument for NOT building new nuclear power stations is that there are different ways of reducing carbon dioxide emissions, such as becoming more energy efficient as a nation and developing renewable energy sources.

They were then asked how strongly they agreed or disagreed with a series of statements. The other half or so of the sample was not presented with any arguments at all, and respondents on this half sample or so were also asked (without any pre-amble) to what extent they agreed or disagreed with the same series of statements.

The purpose of the split-sample design was to present half of the survey sample with a clear, concise positioning which could be understood without any prior knowledge and that would reflect one aspect – from two different points of view (an argument and a counter-argument) – of the debate which has evolved in the UK since late 2004 and intensified since the May 2005 general election.

The series of questions then read out to respondents was designed to present various choices about future energy options, repositioned within the context of nuclear power as a (partial) solution to climate change, and to explore preferences for various combinations of energy sources and / or environmental priorities. Table 3 summarises the responses from people who were, and those who were not, presented with the repositioning arguments.⁴⁷

One of the most interesting findings shown in Table 3 is that most of the responses about future energy options were not generally significantly affected by the framing arguments between the two groups. That is, those who had the arguments read out before answering this question, and those who had not had the arguments read out before answering this question, gave broadly comparable responses (we show the statement group and non-statement group percentages in brackets below).

⁴⁵ Every first, third and fifth interviewee per sample point was read this statement.

⁴⁶ The wording of this statement was changed shortly after the start of fieldwork. For 24 interviews completed between 1st and 3rd October 2005, the statement referred to the UK having 14 nuclear power stations. For the remaining 1,467 interviews, the statement referred to the UK having 12 nuclear power stations. This change was made to reflect the closure of Calder Hall in 2003 and Chapelcross in 2005.

⁴⁷ Appendix Topline Q27.

Table 3. To what extent do you agree or disagree with the following statements? (% tend to agree and strongly agree).⁴⁸

	Statement (N = 812)	No Statement (N=679)	Aggregate (N=1,491)
A. The risks of nuclear power are greater than those of climate change	35	35	35
B. It is better to accept nuclear power than to live with the consequences of climate change	44	38	41
C. I am willing to accept the building of new nuclear power stations if it would help to tackle climate change	55	53	54
D. We shouldn't think of nuclear power as a solution for climate change before exploring all other energy options	73	75	74
E. Promoting renewable energy sources, such as solar and wind power, is a better way of tackling climate change than nuclear power	78	78	78
F. Reducing energy use through lifestyle changes and energy efficiency is a better way of tackling climate change than nuclear power	74	78	76
G. We need nuclear power because renewable energy sources alone are not able to meet our electricity needs	49	47	48
H. Britain needs a mix of energy sources to ensure a reliable supply of electricity, including nuclear power and renewable energy sources	65	62	63
I. If we had safer nuclear power stations, I'd be prepared to support new ones being built	53	52	53
J. It doesn't matter what we think of nuclear power. Nuclear power stations will be built anyway.	62	62	62
K. I am willing to support the continuation of current nuclear power stations provided that renewable energy sources are developed and used at the same time	60	61	61
L. We should stop using nuclear power stations because we do not know how to store radioactive waste safely	44	44	44

Source: UEA/MORI Energy Survey 2005.

⁴⁸ Two items only (B and F) showed a statistically significant difference between the statement and non-statement groups (for B, $\chi^2(1)=3.92$, $p<.05$; for F, $\chi^2(1)=4.99$, $p<.05$).

Other salient points encapsulated in Table 3 are that:

- *A strong preference towards solutions other than nuclear power to mitigate climate change, such as promoting renewable energies (78% statement group / 78% non-statement group), or through behavioural change and energy efficiency (74%/78%).*
- *However, fully 44% (statement group) and 38% (non statement group) felt it is better to accept nuclear power than to live with the consequences of climate change.*
- *Perhaps a more practical assessment by people that reliability of electricity supply would need to be ensured through a mix of energy options, including nuclear power and renewable sources (65%/62% strongly agree or tend to agree) – and an acceptance of future use of nuclear power as long as the latter were being developed and used concurrently (60%/61%).*
- *A fatalistic view that a decision on future use of nuclear power has already been taken, and that nuclear power stations will be built anyway (62%/62% strongly agree or tend to agree).*
- *A more reserved willingness to accept (or reluctant acceptance of) new build nuclear power stations if this helped to tackle climate change (55%/53% strongly agree or tend to agree with this statement; compared with 21%/25% respectively who strongly disagree or tend to disagree).*
- *Some reservations about the safety record of nuclear power stations affecting views on future build (53%/52% of respondents from the two groups strongly agree or tend to agree that they would support new build if we had safer nuclear power stations).*
- *Worry about the safety considerations of radioactive waste disposal was an issue for less than half of the sample (44% of people in both groups).*

The data in Table 3 can be interpreted as an indication of the complexity surrounding energy futures and the difficulty of undertaking simplistic risk-risk tradeoffs within any single framing of the issues (e.g. nuclear energy versus climate change). Indeed, the consistent message from the combined data in this survey is that while higher numbers of people are prepared to accept nuclear power if it contributes to climate change mitigation, very few would actively prefer this as an energy source over renewable sources, given the choice. This quantitative data is fully in line with our earlier qualitative findings of reluctant acceptance (Bickerstaff *et al.*, 2006).

Repeat questions on attitudes to nuclear power and future options

The balance of opinions on the risks and benefits of nuclear power, and the options regarding future role of nuclear power, remained at almost identical levels at the end of the survey with respect to the percentage responses given earlier on.⁴⁹

⁴⁹ Appendix Topline Q10 vs. Q28, and Q14 vs. Q29.

Main Findings and Conclusions

This report presents the findings of a large-scale British survey (n=1491) of public opinion towards future energy options for the nation, with a focus on attitudes to nuclear power in the context of climate change. The main aim of this survey was to build upon previous research to gauge how a representative sample of the British population might respond to the current policy reframing of the issue of nuclear energy within a debate about climate change mitigation and energy futures more generally. This section summarises some of the main descriptive findings of this study and provides some brief overall conclusions.

Interest and Concern

People are generally more interested and concerned about climate change than they are about nuclear power.

Energy/Electricity Generation

People tend to favour renewable energy sources over fossil fuels, whilst nuclear power is the least favoured of the three. When asked about the future contribution of energy sources to reliable and secure electricity supplies, a slightly different picture appears: renewables are still most favoured, but nuclear power now gains a ranking above coal and oil and one comparable with gas.

People do differentiate various electricity generation sources in terms of their (generally positive and negative) factors. In this respect the general stigma attached to nuclear power remains. Specifically, many people think it creates dangerous waste and is a hazard to human health. On the other hand, most people perceive wind power as clean, safe, good for the economy and cheap. Coal on the other hand is seen as polluting and (correctly) as a cause of climate change.

If the costs of supplying the UK's energy needs were the same from either nuclear power or renewable energy sources, 77% of the respondents indicated they would prefer renewable energy sources. Less than 10% would prefer nuclear power over renewables under such circumstances.

Nuclear Power Beliefs

When the issue of nuclear power is considered in isolation there is a fairly evenly balanced spread of opinion, although more people feel negative about nuclear power compared to those who express a positive view.

Future Nuclear Options

In response to a question asking respondents to select between four different future options for nuclear power in Britain, the same proportion of respondents (34%) were of the opinion that "we should continue using existing nuclear power stations, *and replace them with new ones* when they reach the end of their life" as those who thought that "we should continue using the existing nuclear power stations, *but not replace them with new ones* when they reach the end of their life". Only 9% maintained that the number of nuclear power stations should be increased, while 15% were of the view that all existing power stations should be shut down now without replacement.

Climate Change Beliefs

The overwhelming majority of respondents (91%) believe that the world's climate is changing. Many could also correctly identify principal causes of climate change.

A clear majority of respondents (62%) also indicate that *every possible action* should be taken against climate change, whilst a further 32% indicated that some action should be taken against climate change. Of possible actions to address climate change, a big proportion of people indicated demand management through behavioural change; the other most common responses were to increase the use of renewable energy sources and to expand energy-efficient technologies. However, most people also indicated that the main responsibility for change lies at global and national levels, and not with the individual.

A significant proportion of respondents (39%) also believe that nuclear power causes climate change (a finding consistent with other research), suggesting that claims that nuclear power can effectively contribute towards tackling this issue might be met with scepticism by the people who hold this view firmly as a prior belief.

Risks and Benefits of Climate Change and Nuclear Power

In comparing the two issues, we see that climate change is viewed in a far more consistently 'negative' light than nuclear power. That is, few people see climate change as holding benefits and many see it as posing risks, with the latter typically outweighing the former. On the other hand, with nuclear power people see both risks and benefits, with opinion more evenly divided on whether the risks outweigh the benefits or vice versa. That being said, a clear 72% of the sample still believes there are risks to people in Britain from nuclear power.

Framing Nuclear Power in Terms of Climate Change

Across the full sample of respondents⁵⁰ we found a strong preference for solutions other than nuclear power to mitigate climate change, such as promoting renewable energies (78%), or through lifestyle changes and energy efficiency (76%). However, this can be set against the fact that 41% of people agree with the statement that it is better to accept nuclear power than to live with the consequences of climate change, while 54% are willing to accept the building of new nuclear power stations if this would help tackle climate change. The results can also be viewed against feelings that reliability of electricity supply would need to be ensured through a mix of energy options, including nuclear power and renewable sources (63%). A significant proportion (61%) of the respondents also express a willingness to support the continuation of current nuclear power stations, provided that renewable energy sources are developed and used concurrently.

Just over one half of the sample was presented with a statement outlining one argument for and one against building new nuclear power stations in the UK, set within the context of climate change mitigation. The remainder of the sample did not see this statement. One of the most interesting findings of this survey is that responses about future energy options were *not* generally significantly affected by this statement. This result suggests that many people may have already formed quite strong beliefs about both the nuclear and climate change issues respectively. (It should be noted that the arguments presented for and against nuclear power referred purely to those in relation to climate change).

Overall, these responses can be interpreted as an indication of the complexity surrounding energy futures and the difficulty of undertaking simplistic risk-risk tradeoffs within any single framing of the issues (e.g. as a simple nuclear energy *versus* climate change choice).

Overall Conclusions

⁵⁰ The figures in this paragraph are aggregate (i.e. represent the responses across the complete sample, as per Table 3 (column 3) in section 4 of the report).

The consistent message from the combined data in this survey is that while higher proportions of the GB public are indeed prepared to accept nuclear power if it is seen to contribute to climate change mitigation, very few would actively prefer this as an energy source over renewable sources, given the choice. These quantitative data are fully in line with our earlier qualitative findings, that people see *both* climate change and nuclear power as posing problematic choices and hence will only express a 'reluctant acceptance' of nuclear power as a solution to climate change (Bickerstaff *et al.*, 2006), with a considerable resistance also to a positioning of the issues solely in these terms. This does, nevertheless, lead to a degree of pragmatic acceptance by some of a mix of energy sources, at least in the short term, given beliefs about the very real threat that climate change poses.

Our findings also raise some interesting and wider issues for long-term policy on energy futures. The very clear preference expressed, across a range of items on the questionnaire, for renewable energy sources and demand reduction over nuclear energy, if such a choice could be made available to people, suggests the need for a wider public/policy debate on ways of achieving carbon management at the individual and household levels (to supplement those efforts already underway within government and business).

These results have implications for policy at a national level, but do not reveal the issues that could be raised at a more local level (e.g. around new build of nuclear power stations or the siting of windfarms).

As a final comment, our findings suggest that there remains considerable potential for mobilisation and conflict around the issue of renewal of nuclear power in Britain, given the significant numbers currently still opposed to it. However, and as noted above, the findings also indicate that people may (quite correctly) see the whole issue as being more complex than any simple risk-risk trade-off would imply. Accordingly, it may well be the case that there is a need for an extensive policy and public debate which incorporates the *multiple* positionings that can be brought to bear in deciding upon both our short- and long-term energy futures in the UK.

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Appendix – UEA/MORI Energy Survey

Questionnaire Instrument and Topline Findings

- Results are based on 1,491 respondents aged 15+ in Great Britain.
 - A representative quota sample was interviewed with quotas set by age, gender and work status.
 - Interviews were carried out face-to-face across Great Britain, between the 1st of October and the 6th of November
 - Interviews were conducted from 257 sampling points, where one sampling point is 1 Super Output Area (i.e. one pair of OAs)
 - Data are weighted to age, sex, working status using 2001 census data
 - Where results do not sum to 100, this may be due to multiple responses, computer rounding or the exclusion of don't knows/not stated
 - An asterisk (*) represents a value of less than half of one percent, but not zero.
 - Results are based on all respondents unless otherwise stated. Q27 was split-sampled.
-

Good morning/afternoon/evening. I'm from MORI, the market and opinion research company. We're conducting a survey on various issues to gauge the views of the British nation. Would you be willing to be interviewed? The interview will last approximately 30 to 35 minutes.

I would like to assure you that all the information we collect will be kept in the strictest confidence, and used for research purposes only. It will not be possible to identify any particular individual or address in the results.

Q1. SHOWCARD A (R) **How concerned, if at all, are you about each of the following issues?**
 READ OUT A-Q. ROTATE ORDER. TICK START. SINGLE CODE ONLY

		Very concerned	Fairly concerned	Not very concerned	Not at all concerned	No opinion/ Not stated
A	...Acid rain	% 20	42	26	5	6
B	...Air pollution	% 40	47	9	2	*
C	...Climate change, sometimes referred to as global warming	% 44	38	12	3	1
D	...Damage to the ozone layer	% 45	39	11	2	2
E	...Deforestation/ Destruction of tropical forests	% 48	35	12	2	2
F	...Genetically modified food	% 27	35	26	8	4
G	...Household waste disposal	% 30	47	16	4	1
H	...Lack of access to parks/ green spaces	% 21	35	29	12	1
I	...Litter in your neighbourhood	% 38	33	22	6	*
J	...Extinction of species, that is plants and animals	% 41	40	15	2	1
K	...New development in the countryside	% 28	43	21	5	2
L	...Nuclear power	% 28	31	27	11	3
M	...Pesticides, fertilisers and chemical sprays	% 37	41	16	4	1
N	...Pollution of rivers, lakes and seas	% 52	40	6	1	*
O	...Radioactive waste	% 50	30	14	3	*
P	...Road traffic increase	% 38	44	14	3	1
Q	...Using up energy resources that are not replaceable, such as oil and coal	% 40	43	12	2	2

Q2. SHOWCARD B (R) **And what would you say is your level of interest in each of the two issues that I am about to read out?** READ OUT A – B. ROTATE ORDER AND TICK START. SINGLE CODE ONLY FOR EACH

		Very interested %	Fairly interested %	Not very interested %	Not at all interested %	No opinion %
UEA/MORI 2002	...Climate change	27	49	19	5	*
UEA/MORI 2005	...Climate change	34	47	15	3	1
	Change (±)	+7	-2	-2	-2	-1
	...Nuclear power	20	44	28	6	2

Q3. SHOWCARD C (R) **How favourable or unfavourable are your overall opinions or impressions of the following energy sources for producing electricity currently..?** READ OUT A-H. ROTATE ORDER. TICK START. SINGLE CODE ONLY

		Very favourable %	Mainly favourable %	Neither favourable nor unfavourable %	Mainly unfavourable %	Very unfavourable %	Never heard of it %	No opinion /Don't know %
A	...Biomass, that is wood, energy crops, and human and animal waste	18	36	17	6	2	10	9
B	...Coal	7	31	24	25	8	*	3
C	...Gas	10	45	21	14	4	*	3
D	...Hydroelectric power	36	40	11	2	1	3	7
E	...Nuclear power	9	27	22	20	17	1	6
F	...Oil	6	33	22	25	8	*	4
G	...Sun/Solar power	55	32	6	2	1	*	2
H	...Wind power	50	31	8	5	2	*	2

Q4. SHOWCARD D (R) **To what extent do you agree or disagree that the following energy sources will make a substantial contribution to reliable and secure supplies of electricity in Britain in the future?** READ OUT A-H. ROTATE ORDER. TICK START. SINGLE CODE ONLY

		Strongly agree %	Tend to agree %	Neither agree nor disagree %	Tend to disagree %	Strongly disagree %	Never heard of it %	No opinion/ Don't know %
A	...Biomass	11	32	20	13	3	8	11
B	...Coal	6	27	18	35	9	0	4
C	...Gas	8	42	18	24	4	0	4
D	...Hydroelectric power	25	44	13	7	1	2	6
E	...Nuclear power	13	35	20	17	9	*	5
F	...Oil	6	33	20	29	7	*	4
G	...Sun/Solar power	40	38	9	7	1	0	3
H	...Wind power	41	37	8	8	2	*	3

Q5. SHOWCARD E (R) **Using this card, overall how do you feel about nuclear power?** SINGLE CODE ONLY

	%
Very positive	9
Fairly positive	23
Neither positive nor negative	27
Fairly negative	19
Very negative	18
Don't know	3

Government, industry and environmental groups are currently thinking about how Britain should generate electricity in the future...

Q6. SHOWCARD F (R) From what you know or have heard, which two or three of these factors, if any, would you say are the most important for deciding which methods of electricity production should be used in Britain in the future? Just read out the letter or letters that apply. MULTICODE UP TO THREE

		%
A	Cost	23
B	Effects on the landscape	11
C	Efficiency of production	15
D	Helping to prevent climate change	32
E	Impacts on communities living nearby	10
F	Impacts on human health	44
G	Impacts on the economy	9
H	Impacts on the environment	38
I	Impacts on the jobs market	4
J	Independence from other countries' fuels	10
K	Level of pollution	37
L	Reliability of electricity supplies	17
M	Risk of terrorist attack	6
N	Safety	22
	Other (PLEASE WRITE IN)	*
	None of these	1
	Don't know	2

ROTATE ORDER OF ASKING Q7, Q8 AND Q9. TICK START

Q7.

SHOWCARD G (R) **To what extent do you agree or disagree that generating electricity from... coal...** READ OUT A-L. ROTATE ORDER. TICK START. SINGLE CODE ONLY

		Strongly agree %	Tend to agree %	Neither agree nor dis- agree %	Tend to disagree %	Strongly disagree %	No opinion %
A	...causes air pollution	32	47	9	5	2	4
B	...causes climate change	23	42	16	10	2	6
C	...creates dangerous waste	10	28	22	27	4	4
D	...is a hazard to human health	15	37	21	19	2	4
E	...is cheap	6	30	23	24	6	9
F	...is clean	1	8	11	50	25	3
G	...is good for communities living nearby	2	15	24	36	19	3
H	...is good for the economy	3	31	31	20	5	6
I	...is inefficient	5	31	27	23	4	8
J	...is reliable	6	50	17	17	4	4
K	...is safe	5	43	19	21	5	5
L	...spoils the landscape	16	40	21	14	4	3

Q8.

SHOWCARD G (R) AGAIN **To what extent do you agree or disagree that generating electricity from... nuclear power ...** READ OUT A-L. ROTATE ORDER. TICK START. SINGLE CODE ONLY

		Strongly agree %	Tend to agree %	Neither agree nor dis- agree %	Tend to disagree %	Strongly disagree %	No opinion %
A	...causes air pollution	11	24	16	25	11	11
B	...causes climate change	13	26	20	22	9	8
C	...creates dangerous waste	52	32	7	3	1	4
D	...is a hazard to human health	37	33	15	8	2	4
E	...is cheap	6	22	30	20	7	14
F	...is clean	8	33	17	22	10	8
G	...is good for communities living nearby	2	9	19	33	30	5
H	...is good for the economy	7	34	32	10	6	9
I	...is inefficient	3	13	26	34	10	12
J	...is reliable	9	46	22	10	4	9
K	...is safe	3	16	20	30	24	6
L	...spoils the landscape	13	31	22	21	6	6

Q9.

SHOWCARD G (R) AGAIN **To what extent do you agree or disagree that generating electricity from... wind power...** READ OUT A-L. ROTATE ORDER. TICK START. SINGLE CODE ONLY

	Strongly agree %	Tend to agree %	Neither agree nor disagree %	Tend to disagree %	Strongly disagree %	No opinion %
A	1	3	4	28	60	3
B	1	4	6	28	57	4
C	1	2	4	28	61	3
D	1	3	4	31	56	3
E	24	34	18	10	4	9
F	51	39	3	2	2	1
G	13	27	28	21	5	4
H	23	44	19	5	1	5
I	5	19	24	30	12	8
J	13	37	23	16	4	6
K	44	44	6	1	1	3
L	14	30	21	21	12	2

Q10. SHOWCARD H (R) From what you know or have heard about using nuclear power for generating electricity in Britain, on balance, which of these statements, if any, most closely reflects your own opinion? Please just read out the letter that applies. SINGLE CODE ONLY

	%
A	13
B	19
C	20
D	16
E	25
	1
	6

Q11. SHOWCARD I (R) **To what extent do you support or oppose the building of new nuclear power stations in Britain to replace those being phased out over the next few years? This would ensure that the same proportion of nuclear energy is retained.** SINGLE CODE ONLY

	%
Strongly support	11
Tend to support	23
Neither support nor oppose	21
Tend to oppose	20
Strongly oppose	22
Don't know	2

Q12. SHOWCARD J (R) **Which, if any, of the following statements most closely describes your own opinion about nuclear power in Britain today? Just read out the letter that applies.** SINGLE CODE ONLY

	%
A Overall, I support nuclear power	26
B Overall, I oppose nuclear power	37
C I am not sure whether I support or oppose nuclear power	32
D I don't care what happens with nuclear power	3
Other (WRITE IN)	*
None of these	*
Don't know	1

Q13. SHOWCARD K (R) **To what extent do you agree or disagree with each of the following statements that I am going to read out?** READ OUT A-H. ROTATE ORDER. TICK START. SINGLE CODE ONLY

		Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	No opinion
		%	%	%	%	%	%
A	...There are a lot of good things about nuclear power	8	34	22	21	11	5
B	...I have mixed feelings about nuclear power	11	45	15	17	10	2
C	...There are risks to people in Britain from nuclear power	24	48	14	8	1	3
D	...I have strong opinions about nuclear power	20	27	30	17	3	2
E	...I need more information to form a clear opinion about nuclear power	25	42	9	15	7	1
F	...I am not that bothered about nuclear power	2	14	14	41	26	2
G	...I would be prepared to take part in a public discussion or hearing about nuclear power	9	30	17	25	16	3
H	...There are benefits to people in Britain from nuclear power	9	40	25	12	7	6

Q14. SHOWCARD L (R) **Which, if any, of the following statements most closely describes your own opinion about nuclear power in Britain today? Just read out the letter that applies.** SINGLE CODE ONLY

		%
A	We should increase the number of nuclear power stations	9
B	We should continue using the existing nuclear power stations, and replace them with new ones when they reach the end of their life	34
C	We should continue using the existing nuclear power stations, but not replace them with new ones when they reach the end of their life	34
D	We should shut down all existing nuclear power stations now, and not replace them with new ones	15
	None of these	1
	Don't know	6

Q15. SHOWCARD M To what extent do you agree or disagree with each of the following statements that I am going to read out? READ OUT A-F. ROTATE ORDER. TICK START. SINGLE CODE ONLY

		Strongly agree %	Tend to agree %	Neither agree nor disagree %	Tend to disagree %	Strongly disagree %	No opinion %
A	...I feel that current rules and regulations in Britain are sufficient to control nuclear power	4	28	30	18	7	12
B	...I feel confident that the British Government adequately regulates nuclear power	4	28	26	23	10	8
C	...The government is too influenced by the nuclear industry regarding nuclear power	9	32	31	14	2	11
D	...I don't trust the nuclear industry to run nuclear power stations safely	12	28	24	25	5	6
E	...The British nuclear industry can be justifiably proud of its safety record	5	36	30	15	5	8
F	...There are a lot of bad things about nuclear power	17	39	22	14	2	5

Q16. As far as you know, do you personally think the world's climate is changing, or not?

	%
Yes	91
No	4
Don't know	5

ASK IF THINK WORLD'S CLIMATE IS CHANGING (CODE 1 AT Q16).
OTHERS GO TO Q18

Q17. What, if anything, do you think is causing the world's climate to change? DO NOT PROMPT. MULTICODE OK

Base: All who think world's climate is changing (1,361)
%

Air pollution	39
Burning fossil fuels/such as coal and oil/from power stations	29
Burning trees/Forest fires	10
Carbon dioxide	15
Cars/Planes/Transport	31
Deforestation/Logging/clearing of rainforests	15
Global warming (unspecified)	17
Industry/Factories/Emissions from factories	19
Loss of ozone layer	19
Man-made (unspecified)	13
Natural causes (unspecified)	9
Nuclear power	5
Oceans/Oceanic circulation	3
Oil/Gas /coal emissions	9
Solar radiation/The sun	2
Volcanoes/Volcanic activity	2
Other (PLEASE WRITE IN)	21
None of these	*
Don't know	4

ASK ALL

Q18. SHOWCARD N (R) Using this card, overall how do you feel about climate change? Just read out the letter that applies. SINGLE CODE ONLY

		%
A	Very positive	5
B	Fairly positive	14
C	Neither positive nor negative	22
D	Fairly negative	35
E	Very negative	21
	Don't know	3

Q19. SHOWCARD O (R) **From what you know or have heard about climate change, on balance, which of these statements, if any, most closely reflects your own opinion? Please just read out the letter that applies.** SINGLE CODE ONLY

	%
A	4
B	6
C	17
D	22
E	44
	2
	5

Q20. SHOWCARD P (R) **Which, if any, of the following statements most closely describes your own opinion about taking action against climate change? Just read out the letter that applies.** SINGLE CODE ONLY

	%
A	62
B	32
C	3
	1
	2

ASK Q21 OF ALL EXCEPT THOSE WHO SAY 'NO ACTION' (CODE '3') AT Q20.

Q21. SHOWCARD Q (R) From what you know or have heard, which two or three, if any, of these ways would best tackle climate change? Just read out the letter or letters.
MULTICODE UP TO THREE

Base: All who do not say 'no action should be taken' against climate change (1,439)
%

A	Continue to use fossil fuels (such as gas and coal) but with capture and storage of carbon dioxide that is produced	12
B	Expand the use of energy-efficient technologies	54
C	Expand the use of nuclear power	14
D	Expand the use of renewable energy sources (such as solar and wind power)	68
E	Change people's behaviour so that they reduce their energy consumption	69
F	Reduce energy consumption through regulation and taxes	12
	Other (PLEASE WRITE IN)	1
	None of these	*
	Don't know	3

ASK ALL

Q22. SHOWCARD R (R) **To what extent do you agree or disagree with each of the following statements about climate change?** READ OUT A-H. ROTATE ORDER. TICK START. SINGLE CODE ONLY

		Strongly agree %	Tend to agree %	Neither agree nor disagree %	Tend to disagree %	Strongly disagree %	No opinion %
A	...There are a lot of good things about climate change	1	8	15	40	30	4
B	...I have mixed feelings about climate change	5	36	15	23	18	2
C	...There are risks to people in Britain from climate change	28	49	11	7	1	3
D	...I have strong opinions about climate change	26	33	23	12	3	2
E	...I need more information to form a clear opinion about climate change	17	46	12	16	7	1
F	...I am not that bothered about climate change	2	10	10	38	39	1
G	...I would be prepared to take part in a public discussion or hearing about climate change	12	30	17	23	15	2
H	...There are benefits to people in Britain from climate change	1	12	21	33	27	4

ASK Q23 OF ALL EXCEPT THOSE WHO SAY 'NO ACTION' (CODE '3') AT Q20.

Q23. SHOWCARD S (R) **Which one, if any, of these do you think should be mainly responsible for taking action against Climate change?** Just read out the letter that applies. SINGLE CODE ONLY

Base: All who do not say 'no action should be taken' against climate change (1,439)

		%
A	Environmental groups	4
B	Individuals and their families	8
C	Industry/ Companies	10
D	Local authorities	2
E	National Governments	39
F	The international community	32
	None of these	*
	Don't know	2

ASK ALL

Q24. SHOWCARD T (R) **To what extent do you agree or disagree with each of the following statements about climate change?** READ OUT A-E. ROTATE ORDER. TICK START. SINGLE CODE ONLY

		Strongly agree %	Tend to agree %	Neither agree nor dis-agree %	Tend to disagree %	Strongly disagree %	No opinion %
A	...I feel that current rules and regulations in Britain are sufficient to tackle climate change	2	14	18	39	19	8
B	...I feel confident that the British Government adequately tackles climate change	1	12	18	41	22	5
C	...The government is too influenced by the oil industry on climate change	21	38	22	8	1	8
D	...There are a lot of bad things about climate change	33	44	13	5	1	3
E	...It doesn't matter how we generate electricity in Britain, climate change is going to happen anyway	10	42	13	21	10	4

Q25. SHOWCARD U **To what extent do you agree or disagree that using the following energy sources to generate electricity can help prevent climate change?** READ OUT A-H. ROTATE ORDER. TICK START. SINGLE CODE ONLY

		Strongly agree %	Tend to agree %	Neither agree nor dis-agree %	Tend to disagree %	Strongly disagree %	Never heard of it %	No opinion %
A	...Biomass	11	33	19	14	3	8	10
B	...Coal	2	14	15	45	20	*	4
C	...Gas	2	21	19	38	13	*	5
D	...Hydroelectric power	29	42	14	5	1	2	6
E	...Nuclear power	9	28	20	21	14	*	6
F	...Oil	1	12	20	41	19	*	4
G	...Sun/Solar power	47	38	7	3	1	*	3
H	...Wind power	49	37	6	3	2	*	3

Q26. SHOWCARD V (R) **If the costs of supplying the UK's energy needs were the same from either nuclear power or renewable energy sources (such as solar and wind power), which, if either, would you prefer? Just read out the letter that applies.** SINGLE CODE ONLY

		MORI/Greenpeace 2002 (973)	UEA/MORI 2005 (1,491)	Change
			%	(±)
	Base: GB Adults aged 15+			
A	Much prefer nuclear power	3	3	-
B	Slightly prefer nuclear power	3	5	+2
C	I have no preference either way	17	13	-4
D	Slightly prefer renewable energy sources	12	17	+5
E	Much prefer renewable energy sources	60	60	-
	Don't know	5	1	-4

READ OUT FOR ONE HALF OF YOUR INTERVIEWS (NUMBERS 1, 3, AND 5 FOR EACH SAMPLE POINT). PLEASE TICK BOX TO SHOW YOU HAVE READ THE STATEMENT.

<p>VERY IMPORTANT</p> <p>PLEASE TICK BOX IF READING OUT</p>	<p>The UK currently has 12⁵¹ nuclear power stations, which provide nearly a quarter of our electricity. Over the next 20 years most of these will close, as they reach the end of their lives. When thinking about whether or not to build new nuclear power stations to replace them, the Government needs to consider a number of things. These include: the cost, the waste produced, health, the risk of accidents, the UK's dependency on importing fuels from other countries, our electricity consumption and the effect on climate change.</p> <p>As you may know, one argument for building new nuclear power stations is that they would help prevent climate change by not emitting carbon dioxide when generating electricity, unlike coal or gas-fired power stations. One argument for NOT building new nuclear power stations is that there are different ways of reducing carbon dioxide emissions, such as becoming more energy efficient as a nation and developing renewable energy sources.</p>
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⁵¹ The wording of this statement was changed shortly after the start of fieldwork. For 24 interviews completed between 1st – 3rd October 2005, the statement referred to the UK having 14 nuclear power stations. For the remaining 1,467 interviews, the statement referred to the UK having 12 nuclear power stations. This change was made to reflect the closure of Calder Hall in 2003 and Chapelcross in 2005.

Q27. SHOWCARD W **To what extent do you agree or disagree with each of the following statements?** READ OUT A-L. ROTATE ORDER. TICK START. SINGLE CODE ONLY

Base: All who had 1st and 2nd paragraph above read out (812)

	Strongly agree %	Tend to agree %	Neither agree nor disagree %	Tend to disagree %	Strongly disagree %	No opinion %
A ...The risks of nuclear power are greater than those of climate change	10	26	22	25	9	7
B ...It is better to accept nuclear power than to live with the consequences of climate change	9	35	22	21	7	5
C ...I am willing to accept the building of new nuclear power stations if it would help to tackle climate change	12	42	20	14	7	2
D ...We shouldn't think of nuclear power as a solution for climate change before exploring all other energy options	29	43	10	8	4	3
E ...Promoting renewable energy sources, such as solar and wind power, is a better way of tackling climate change than nuclear power	39	38	10	7	2	2
F ...Reducing energy use through lifestyle changes and energy efficiency is a better way of tackling climate change than nuclear power	31	44	13	6	2	2
G ...We need nuclear power because renewable energy sources alone are not able to meet our electricity needs	10	39	22	17	6	5
H ...Britain needs a mix of energy sources to ensure a reliable supply of electricity, including nuclear power and renewable energy sources	18	47	18	10	3	2

CONTINUED OVERLEAF

		Strongly agree %	Tend to agree %	Neither agree nor disagree %	Tend to disagree %	Strongly disagree %	No opinion %
I	...If we had safer nuclear power stations, I'd be prepared to support new ones being built	15	38	19	15	8	3
J	...It doesn't matter what we think of nuclear power. Nuclear power stations will be built anyway.	12	49	16	14	4	3
K	...I am willing to support the continuation of current nuclear power stations provided that renewable energy sources are developed and used at the same time	15	45	18	13	5	3
L	...We should stop using nuclear power stations because we do not know how to store radioactive waste safely	19	25	23	21	8	3

READ OUT FOR ONE HALF OF YOUR INTERVIEWS (NUMBERS 2, 4, AND 6 FOR EACH SAMPLE POINT).

Q27 SHOWCARD W **To what extent do you agree or disagree with each of the following statements?** READ OUT A-L. ROTATE ORDER. TICK START. SINGLE CODE ONLY

Base: All who did not have the two paragraphs (used for other version) read out: 679

	Strongly agree %	Tend to agree %	Neither agree nor disagree %	Tend to disagree %	Strongly disagree %	No opinion %
A	9	26	25	25	6	3
B	6	32	23	22	9	6
C	9	44	16	16	9	3
D	29	46	10	6	3	3
E	41	37	10	5	1	2
F	34	44	11	4	1	2
G	10	37	21	17	7	5
H	18	47	18	10	3	2
I	13	39	16	16	10	3
J	12	50	14	14	3	3

K	...I am willing to support the continuation of current nuclear power stations provided that renewable energy sources are developed and used at the same time	13	48	16	11	6	3
L	...We should stop using nuclear power stations because we do not know how to store radioactive waste safely	20	23	22	21	6	4

THE DATA FOR THIS QUESTION WERE SPLIT-SAMPLED AND THE DATA (BELOW) REPRESENT THE AGGREGATE OF THE FULL SAMPLE

Q27 SHOWCARD W **To what extent do you agree or disagree with each of the following statements?** READ OUT A-L. ROTATE ORDER. TICK START. SINGLE CODE ONLY

Base: All respondents (1,491)

	Strongly agree %	Tend to agree %	Neither agree nor disagree %	Tend to disagree %	Strongly disagree %	No opinion %
A	9	26	24	25	8	6
B	8	34	22	21	8	5
C	11	43	18	15	8	3
D	29	45	10	7	3	3
E	40	38	10	6	2	2
F	32	44	12	5	2	2
G	10	38	22	17	6	5
H	17	46	17	11	3	3
I	14	39	18	16	9	3
J	12	50	15	14	4	3

K	...I am willing to support the continuation of current nuclear power stations provided that renewable energy sources are developed and used at the same time	14	46	17	12	5	3
L	...We should stop using nuclear power stations because we do not know how to store radioactive waste safely	19	24	23	21	7	3

We'd now like to repeat a couple of questions to see what your views are as this interview has unfolded...

Q28. SHOWCARD X (R) From what you know or have heard **about using nuclear power for generating electricity in Britain** on balance, which of these statements, if any, most closely reflects your own opinion? Please just read out the letter than applies. SINGLE CODE ONLY

		From Q10 %	Q28 %	Change (±)
A	The benefits of nuclear power far outweigh the risks	13	12	-1
B	The benefits of nuclear power slightly outweigh the risks	19	19	-
C	The benefits and risks are about the same	20	21	+1
D	The risks of nuclear power slightly outweigh the benefits	16	18	+2
E	The risks of nuclear power far outweigh the benefits	25	25	-
	None of these	1	*	-
	Don't know	6	4	-4

Q29. SHOWCARD Y (R) Which, if any, of the following statements most closely describes your own opinion about nuclear power in Britain today? Just read out the letter that applies. SINGLE CODE ONLY

		From Q14 %	Q29 %	Change (±)
A	We should increase the number of nuclear power stations	9	8	-1
B	We should continue using the existing nuclear power stations, and replace them with new ones when they reach the end of their life	34	35	+1
C	We should continue using the existing nuclear power stations, but not replace them with new ones when they reach the end of their life	34	37	+3
D	We should shut down all existing nuclear power stations now, and not replace them with new ones	15	14	-1
	None of these	1	1	-
	Don't know	6	6	-

Q30. SHOWCARD Z (R) **And finally to what extent do you agree or disagree with each of the following statements that I am going to read out?** READ OUT A-E. ROTATE ORDER. TICK START. SINGLE CODE ONLY

		Strongly agree %	Tend to agree %	Neither agree nor disagree %	Tend to disagree %	Strongly disagree %	No opinion %
A	...The less that government intervenes in the economy, the better it is for Britain	7	23	21	33	10	5
B	...The government should take measures to reduce differences in income levels	20	44	16	13	4	3
C	...Employees need strong trades unions to protect their working conditions and wages	23	40	17	12	4	2
D	...Economic growth always ends up harming the environment	9	33	25	24	3	5
E	...Modern science can be relied on to solve our environmental problems	6	33	26	23	6	3

Gender

	%
Male	48
Female	52

WRITE IN & CODE EXACT AGE**Exact Age**

	%
15-24	15
25-34	16
35-44	19
45-54	16
55-59	8
60-64	6
65-74	10
75+	9

Working Status of Respondent:

	%
Working - Full time (30+ hrs)	44
- Part-time (9-29 hrs)	13
Unemployed	3
Not working - retired	24
- looking after	7
- invalid/disabled	2
Student	6
Other	*

Class

	%
A	3
B	21
C1	29
C2	21
D	16
E	9

Respondent is:

	%
Chief Income Earner	59
Not Chief Income Earner	36

D1 SHOWCARD AA **Using this card, please tell me which, if any, is the highest educational or professional qualification you have obtained. Just read out the letter or letters that apply.** (IF STILL STUDYING, CHECK FOR HIGHEST ACHIEVED SO FAR). MULTICODE OK

	%
A GCSE/O-level/CSE	23
B Vocational quals	10
C A level or equivalent	13
D Bachelor Degree or equivalent (=NVQ4)	17
E Masters/PhD or equivalent	5
Other	6
No formal qualifications	22
Still studying	2
Don't know	*

D2 **Number of children in the household?**
SINGLE CODE ONLY

	%
None	64
1	16
2	11
3	5
4 or more	2
Don't know/Refused	*

ASK IF CHILDREN IN HOUSEHOLD

D3 **What ages are the children in the household?** MULTICODE OK

	%
0-4	42
5-7	29
8-10	33
11-14	45
Don't know/Refused	*

D4 SHOWCARD BB (R) **Which, if any, of the following applies to you? Just read out the letter or letters.** MULTICODE
OK

	%
A Been a member of a science organisation in the last 5 years	3
B Currently subscribe to a science magazine	3
C Have (ever) worked as a scientist or engineer	7
D Have a science or engineering degree	6
E Have bought a science magazine in the past year	6
F Have studied science to A level	15
G Have studied science to degree level	7
H Have studied science to GCSE/O Level	33
I Have taught a science subject	4
J I am a scientist	3
K I am an engineer	7
L I have never met a scientist or engineer	8
M I have scientists or engineers among my friends and relatives	30
N I meet scientists or engineers frequently (i.e. at least once a month)	15
O I meet scientists or engineers infrequently (less than once a year)	6
P I work with scientists or engineers	10
Q Member of a science organisation	2
R Once subscribed to a science magazine but don't now	5
S I have looked up scientific information on the internet	23
None of these	32
Don't know	*

D5 SHOWCARDS CC (R) **Which, if any, of the following things have you done in the last year or two? Just read out the letter or letters that apply.** MULTICODE OKAY

	%
A Walked in the countryside/along the coast	78
B Read/watched TV about wildlife/conservation/natural resources/Third World	81
C Selected one product over another because of its environmental-friendly packaging, formulation or advertising	40
D Been a member of an environmental group/ charity (even if you joined more than two years ago)	12
E Given money to or raised money for wildlife/conservation or Third World charities	51
F Campaigned about an environmental issue	6
G Subscribed to a magazine concerned with wildlife/conservation/natural resources/Third World	13
H Visited/written a letter to an MP/ councillor about wildlife/conservation/ natural resources/Third World	6
I Written a letter for publication to a newspaper about wildlife/conservation/natural resources/Third World	3
J Requested information from an organisation dealing with wildlife/conservation/natural resources/Third World	16
K Have a car that runs on LPG/liquefied petroleum gas/Have a car with a 'hybrid' engine	2
L Taken bottles, glass, paper, cans or other materials to be recycled, or left them for others to collect for recycling	85
None of these	3
Don't know	0

D6 How would you vote if there were a General Election tomorrow? (IF AGED 15-17 ADD: If you were old enough to vote?) SINGLE CODE ONLY

	%
Conservative	17
Labour	27
Liberal Democrats (Lib)	10
Scottish/Welsh Nationalist	1
Green Party	3
Democratic Party	*
UK Independence Party	*
Other	1
Would not vote	12
Undecided	23
Refused	4

ASK D7 IF UNDECIDED OR REFUSED AT D6
OTHERS GO TO D8

D7 Which party would you be most inclined to support? SINGLE CODE ONLY

	%
Conservative	13
Labour	15
Liberal Democrats (Lib Dem)	9
Scottish/Welsh Nationalist	*
Green Party	1
Democratic Party	0
UK Independence Party	1
Other	1
Would not vote	2
Undecided	40
Refused	13

ASK ALL

D8 SHOWCARD DD **Which of the groups on this card do you consider you belong to? Again, just read out the letter that applies.** SINGLE CODE ONLY

		%
WHITE		
A	British	85
B	Irish	1
C	Any other white background (PLEASE WRITE IN)	4
MIXED		
D	White and Black Caribbean	*
E	White and Black African	*
F	White and Asian	*
G	Any other mixed background (PLEASE WRITE IN)	*
ASIAN OR ASIAN		
H	Indian	2
I	Pakistani	1
J	Bangladeshi	*
K	Any other Asian background (PLEASE WRITE IN)	1
BLACK OR BLACK		
L	Caribbean	1
M	African	2
N	Any other black background (PLEASE WRITE IN)	*
CHINESE OR OTHER ETHNIC GROUP		
O	Chinese	*
	Any other background (PLEASE WRITE IN)	*
	Refused	*