

HOW TO CHANGE ATTITUDES AND BEHAVIOURS IN THE CONTEXT OF ENERGY

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Abstract

It is commonly assumed that attitudes and behaviours need to be modified in order to achieve energy efficiency and secure a sustainable energy supply for the future. This paper focuses particularly on public (as opposed to corporate) attitudes and behaviours, and examines present insights and future directions within social science in this extensive field of study.

Alongside instruments such as regulation and economic measures, government campaigns within the energy and environmental fields have sought to 'educate' the public, and have often been predicated on a rationalist 'information deficit model'. However, such a model has been criticised on both pragmatic and academic grounds. Insights from the social sciences in the areas of energy consumption and facility siting demonstrate that a thorough, interdisciplinary, understanding of attitudes and behaviours is necessary.

Research demonstrates the need to take account of the physical, social, cultural and institutional contexts that shape and constrain people's choices. There are also important insights into opposition to energy facilities, which has been inadequately characterised as NIMBYism. Much recent work points to the need for more deliberation and better (not just top-down) communication between decision makers, technical experts, other stakeholders and the public.

Predicting future developments in the social sciences is more challenging but it is expected that, as our understanding of attitudes and behaviours develops and more genuinely interdisciplinary work is pursued, attention may be focused on aspects of policy learning, a more critical examination of the 'deliberative turn', and the need for a systemic approach to complex socioeconomic systems. Furthermore, the consistency of government objectives across all policy spheres is likely to provide an important avenue for future research.

Introduction: the scope of this paper

The question suggested by the title of this paper is a normative one: it implies that attitudes and behaviours in the context of energy need to change, and that there exist predetermined goals around which modified attitudes and behaviours should be shaped. One important insight from social scientific research – to which we return below – is that such goals may not in fact be consensual. For now, however, we note the commonplace assumption that attitudes and behaviours need to be modified in order (i) to manage demand and achieve step-changes in energy efficiency, and (ii) to secure a sustainable energy supply for the future, involving the siting of new facilities. The object of this paper is to consider what social science can tell us about these issues, and how current knowledge is most likely to evolve.

This is potentially a vast field. Social scientists have long been interested in attitudes and behaviours, and insights from across the social sciences have

increasingly been applied to a range of energy and environmental issues. Given limited space, it is necessary to be selective. We therefore focus on public (rather than corporate) attitudes and behaviours, and on two areas in which these are significant: that of energy consumption, drawing examples from both the domestic and personal transport sectors; and that of siting issues, considering both established and novel technologies. In looking to the future, we characterise eight themes around which social scientific work in this area is likely to develop.

Attitudes and behaviours in the context of energy: insights from social science

It is often offered as a paradox that apparently pro-environmental attitudes (expressed, for example, in surveys or in focus groups) are not reflected in significant shifts in behaviour; or that attitudes held by individuals are apparently inconsistent. This should not be surprising, given the complexity of both categories and of the relationship between them, as revealed by a substantial body of research in social psychology (Jackson 2005). Furthermore, behavioural change can sometimes be effected without an explicit change in attitudes, through regulation or through economic instruments such as pricing, taxation and incentives.¹ There are acknowledged political risks, however, in pursuing such strategies in isolation.

This probably explains the persistent emphasis in policy discourse on awareness-raising and education. Government campaigns in the energy and environmental field have often been predicated on a rationalist 'information deficit model' (see Burgess et al. 1998), which assumes that 'environmental education, drawing from scientific work, will lead to people making the link between policy and action, and acting in order to meet policy objectives' (Eden 1996:197). This assumption has not been borne out in practice. Providing information may in some circumstances influence attitudes on issues like energy and the environment, but 'often has little or no impact on behaviour' (McKenzie-Mohr 2000:544). Attitudes themselves are influenced by a variety of social, political and cultural factors aside from information provision.²

The information deficit model has been widely criticised in the academic literature, both on epistemic grounds ('the facts' may be contested and the problem framed³ in different ways) and for its failure to take account of the social, cultural and institutional contexts in which attitudes and behaviours are formed.

Energy demand and energy efficiency

Interesting examples can be found in the field of domestic energy consumption where, in spite of successive campaigns,⁴ the take-up of energy-efficiency measures has been disappointing and behaviours have often become *more* energy-intensive. The most familiar explanations rely on variants of market failure, including lack of information, but disciplines such as sociology, social psychology, human geography and anthropology are

increasingly providing insights into patterns of energy consumption. Behaviour is shown to be influenced in complex ways by factors such as price, awareness, trust and commitment (including a sense of moral obligation) (Devine-Wright and Devine-Wright 2004).⁵ Recent work has also drawn attention to the important influence of cultural norms, routine habits and practices, social networks (see, for example, Jaeger et al. 1993⁶) and fashion (e.g. in lighting⁷), and to the dynamic interplay of human agents and technologies in socio-technical systems (for an interesting discussion, see Lovell 2005). For example, energy consumption depends on an 'established infrastructure of taken-for-granted hardware or technological systems', such as washing machines and showers, which structure patterns of daily life (Shove and Warde 1998). It is also influenced by dominant conceptions of comfort, cleanliness and convenience, which become embedded in the built environment (Shove 2002).

Similarly, exhortations that individuals should change their travel behaviour have overlooked important contextual constraints on the capacity for effective action. The physical and social structures of modern life (spatial separation of activities, cultural norms of mobility and consumption, choice in public services) make it difficult to act upon the message that driving contributes to climate change, especially when price signals provide a powerful counter-incentive (Owens and Cowell 2002, Chapter 5).

In both contexts – domestic energy consumption and transport – individuals may perceive that they have 'neither the prime responsibility to take action, nor the agency to have much effect' (Owens 2000:1143).⁸ Paradoxically, research suggests that people see governments as responsible for addressing environmental problems, yet have little faith that they will (Burgess et al. 1998; Eden 1993; Blake 1999; Bulkeley 1999; Darier and Schüle 1999). This might in part be because the messages that people receive from Government are inconsistent: while low fuel prices are emphasised, and increases resisted, people are exhorted to change their behaviour. Building and planning regulations seek to reinforce the second message, but struggle to contend with the first (for an analysis of mixed messages, see Owens 1995, 1996).

Facility siting and the acceptability of energy technologies

Public attitudes have come to be seen as crucial in the choice of energy futures. Attitudes to particular technologies as well as responses to specific development proposals have been of interest. Public fear and suspicion of nuclear and nuclear-waste facilities have long been documented, though recent work suggests that the British public's attitude towards new nuclear power stations might best be characterised as one of ambivalence, with 'reluctant acceptance' only in the face of climate change (Bickerstaff et al. (forthcoming); see also Poortinga et al. 2006). In the case of renewable energy, a generally favourable public attitude often co-exists with resistance to specific developments (see Haggett 2004;⁹ see also Department of Trade and Industry 2006). This is often articulated through planning or related processes and is typically regarded as NIMBYism (see, for example, Upham and Shackley 2006; Wolsink 2006). These issues are now the subject of an

extensive literature. Here, we note three (interrelated) ways in which our understanding has been enhanced through social scientific research.¹⁰

First, this is another area in which the 'information deficit' model has demonstrably failed. Providing more information about the need for, or characteristics of, controversial developments has not notably delivered acquiescence on the part of local communities: on the contrary, it can fuel distrust (especially if information comes from developers), and further polarise opinions. When key considerations such as need, impacts, risks and economics are genuinely contested, 'providing the facts' is problematic. Instead, information will be interpreted in the light of pre-existing frames.¹¹ A *lack* of timely communication and consultation, however, is likely to make matters even worse.¹²

Second, what is often dismissed as NIMBYism has been shown in much recent research to be a more complex and multi-faceted phenomenon, of which 'pure' NIMBYism forms only one component (Devine-Wright (2005a) provides a critical overview of research in the context of wind energy; see also Wolsink (2006); Freudenburg and Pastor (1992); Kemp (1990).¹³ According to one recent study (on the nature of resistance to wind power in the UK), the term 'is an opinion-poll-perpetuated myth, unhelpful in understanding the wider environmental debate, derogatory to those who are labelled by it and misleading in its simplistic stereotyping' (Ellis et al. 2006). In cases like nuclear facilities, similar findings have been reinforced by increasingly sophisticated understandings of risk, in which the old dichotomy between 'objective' and 'perceived' risk has been substantially discredited (see, for example, Adams 1995; Slovic 1993; Thompson and Dean 1996; Jasanoff (forthcoming)).

Third, the familiar characterisation of siting controversies as conflicts between national need and local interests has been shown to be misleading. Rather, questions about the desirability of technologies *in principle* become entangled with issues that relate to specific localities. This calls into question the assumption that 'generic' and 'local' issues can readily be separated, and suggests that institutions like public inquiries, rather than being 'streamlined', should be seen as important arenas for public deliberation and for scrutiny of energy policy (for more detail, see Owens 2002, 2004).

These new understandings have had some influence, for example, in the recent consultative and deliberative exercises run by the Committee on Radioactive Waste Management (CoRWM: <http://www.corwm.org.uk/>). Research also suggests that a degree of 'ownership' of energy facilities in local communities may positively influence people's attitudes towards them (Devine-Wright 2005a, 2005b; see also Haggett 2004; and the current Economic and Social Research Council (ESRC) project on community energy initiatives, part of the Sustainable Technologies programme: <http://www.sustainabletechnologies.ac.uk/>), though support can still co-exist with opposition and distrust (Upham and Shackley 2006). The interesting question, then, is not 'how can we change public attitudes', but how we can plan and move forward in the face of what are likely to remain irreducible controversies.

It should be noted that some emergent technologies have not yet been manifest in developments 'on the ground'; their implications may still seem remote, and public acceptability is less well researched. One project working with citizen panels found a marginally positive attitude developing towards carbon capture and storage, with several provisos. Support was dependent on concern about climate change and a conviction that CO₂ emissions needed to be reduced. And, as with nuclear, carbon sequestration found favour only as part of a wider strategy including renewables, efficiency improvements and lifestyle changes (Shackley et al 2005).¹⁴ In other cases – for example, hydrogen energy – relatively little is known about public attitudes and how they are likely to develop (for a discussion of public attitudes and risk in this context, see Flynn et al. 2006).

The current 'state of science': key themes

The following key messages can be drawn from the above review:

- i Attitudes and behaviours are complex. A thorough, interdisciplinary, understanding is a pre-requisite for any strategy aimed at change.
- ii Regulation, economic instruments and provision of information have all been used in attempts to modify attitudes and/or behaviours.
- iii Physical, social, cultural and institutional contexts shape and constrain people's choices and options. Recent work has contributed significantly towards an understanding of these influences.
- iv Technical infrastructures and social norms interact to affect behaviour over time. Both may be resistant to change.
- v The instinct to target attitudes and behaviours through education and awareness-raising remains powerful. But information is unlikely to be effective if it runs counter to other powerful influences, such as social norms or prices. This is not to suggest that information is dispensable: but it should be part of a wider strategy, will not necessarily be neutral, and should flow in more than one direction (see vii).
- vi Conflicts over energy facilities are often of the kind that can't be resolved by recourse to 'the facts'. Opposition to particular technologies, or specific sites, is not necessarily irrational, and is not adequately characterised as NIMBYism.
- vii Much recent work concerned with attitudes and behaviours points to the need for more interactive, deliberative communication between decision makers, technical experts, other stakeholders and the public.¹⁵ This has considerable significance both for demand management (which, according to some commentators, should evolve into 'demand-side participation' (Devine-Wright and Devine-Wright 2004)) and for ways in which energy is supplied.

Future developments

Looking towards future developments across such a broad field is challenging. One important observation is that the evolution of social scientific understanding of attitudes and behaviours in the energy context (and in relation to environment and sustainable development more generally) has been rapid over the past few years, and this is reflected in substantial investment in research, which we might expect to bear fruit in the coming decades. Appendix 2 outlines some relevant recent initiatives. Bearing this in mind, we now consider potentially important developments and, in doing so, highlight a number of tensions.

Knowing about attitudes and behaviours

We might expect techniques for eliciting and understanding public attitudes and behaviours to become more sophisticated. For example, the traditional opinion poll and other forms of survey could be transformed by technological developments, while more deliberative approaches may be refined and relatively novel methodologies such as Q-methodology¹⁶ further developed. Overall, we might expect to get a better picture both of attitudes and behaviours.

New disciplinary insights and more sophisticated concepts of interdisciplinarity

Within the social sciences, important insights into attitudes and behaviours are emerging from such areas as anthropology, economics, human geography, politics, social psychology, and sociology. These insights are likely to be further developed, with the potential to make a substantial contribution to policy formulation and implementation. The concept of interdisciplinarity – much invoked in the energy and environmental fields – is itself likely to be subjected to more critical scrutiny. The division of labour implicit in many calls for interdisciplinary work – in which the natural and technical sciences define the problems and potential solutions, and the social sciences (with the exception of economics) tend to be treated as an 'add on' – might give way to more genuine and productive dialogue and learning between disciplines (Petts et al. (in press)). Socio-technical systems are likely to become a more important category for analysis.

Dealing with complexity

More nuanced understandings emerging from new disciplinary and interdisciplinary contributions will present policy makers with greater complexity in their attempts to influence attitudes and behaviours. The virtue of older models, such as 'information deficit', was that they pointed to relatively simple solutions which, to use Fisher's term, were 'yesable' (Fisher 1971, cited in Williams 1993). Recognising the complexity of factors involved, on the other hand, makes it harder to identify appropriate policy levers. More attention is likely to be focused on aspects of policy learning.

Reconceiving the role of the public and consumers

One of the most substantive shifts across the social sciences over the past two decades has been the emphasis on deliberation, often associated with more inclusive participation. Public engagement, involving (at least) a two-way flow of knowledge, has been held to be more fruitful than top-down communication, which treats the public as passive recipients. Roles and responsibilities of the public and consumers might also be reconceived in the light of demand- and supply-side developments such as 'smart metering' and

micro- or community-scale generation (Devine-Wright and Devine-Wright 2004, 2006; see also Marvin et al. 1999, who consider utility meters as socio-technical systems). We may start to think, for example, in terms of 'energy citizens' (Devine-Wright (forthcoming)) or 'energy co-providers' (van Vliet 2004).

The deliberative turn challenged?

It is ironic that just as numerous organisations are acknowledging the importance of deliberation, and seeking to put it into practice, a critique of the 'deliberative turn' is emerging (see Owens (2000) for an overview; also Sanders (1997) and Pellizzoni (2001) for some interesting discussion). This critical literature is likely to develop rapidly, exploring issues of democracy, discursive competence (Foster 1997) and practicality. The result may be more targeted approaches, which depend on the specific issue in question, and which do not assume that 'deliberation' will resolve all conflicts. Questions of citizenship and democratic accountability in complex, technological societies are likely to command increasing attention in both research and policy.

Avoiding mixed messages

A significant contribution of much recent work has been a better understanding of the social context for individual behaviour and a recognition that changing both attitudes and behaviours requires much more than the provision of information. We also know that mixed messages – as when people are exhorted to do one thing, but price signals and the constraints of everyday life point to another – can lead to confusion, resentment or hostility. This points to the need for coherence and consistency in policy instruments, because 'the greatest degree of behavior change occurs when different strategies combine' (Gardner and Stern (1996); they provide a useful discussion, with North American examples, of what they call 'combining the solution strategies' (Chapter 7)). The combination of incentives, regulation, information and public engagement should be sensitive to the (often contextually-specific) factors that inhibit behavioural change (Gardner and Stern (1996) offer an approach – 'community-based social marketing' – that merges insights from psychology with expertise from social marketing). Further interdisciplinary work, together with experiments in practice, are likely to improve our understanding of the ways in which different instruments can work together to achieve particular objectives.

The need for a systemic approach

Policy levers applied to complex socioeconomic systems often have less impact than anticipated, and sometimes they have unintended or even perverse consequences. So, for example, energy efficiency improvements may not be reflected in energy *conservation* because people consume more of the good concerned (e.g. bigger cars and fridges). Or savings in one area might be 'spent' in another (e.g. on cheap flights). The so-called 'rebound

effect' has been the subject of much dispute; research is likely to clarify the implications for energy-efficiency policy.¹⁷

Confusion of objectives

Implicit in much of the academic and policy discourse on changing attitudes and behaviours is the assumption that we know what we want to change them *to*. In some cases (e.g. 'reducing wasteful energy consumption'), there may be little dissent, but other objectives, such as 'making nuclear installations (or wind farms, or whatever) more acceptable' will continue to be contentious. Government itself may be deeply ambivalent about some objectives, such as lowering levels of material consumption. In this sense a growing interest in the relationship between well-being, material consumption and GDP seems likely to provide an important new avenue for research, with significant implications for the potential to influence attitudes and behaviours in the context of energy.

Finally, it is worth bearing in mind that, while they may seem relatively stable at any particular moment, both attitudes and behaviours do change – and change quite radically – over time. Understanding this process, too, will be an important consideration in the shift towards a more sustainable energy economy.

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Appendix 2

RESEARCH CENTRES AND PROGRAMMES AND PROJECTS WITH RELEVANCE TO ENERGY POLICY

Below are examples of initiatives, centres, programmes and projects in the energy field that include a social science dimension. The aim in this appendix is to be illustrative rather than exhaustive.

Cross-Research Council Initiatives

- Tyndall Centre for Climate Change Research (NERC, EPSRC, ESRC) (ESRC funding £1.25 million) (2000–2005): <http://www.tyndall.ac.uk/index.shtml>
- UK Energy Research Centre, part of the £28 million *Towards a Sustainable Energy Economy Programme* (NERC, EPSRC, ESRC) (2004–2009): <http://www.ukerc.ac.uk/>; see also SUPERGEN Programme, supporting research into sustainable power generation and supply: <http://www.epsrc.ac.uk/ResearchFunding/Programmes/Energy/Funding/SUPERGEN>
- Carbon Vision Initiative (EPSRC and Carbon Trust, with contributions from ESRC and NERC). For information about a socio-technical, longitudinal study of carbon use in buildings: <http://www.carb.org.uk/>

ESRC Research Centres

Although energy is not the prime focus, some research at the following Centres is of relevance:

- Centre for Social and Economic Research on the Global Environment (CSERGE) (UEA): <http://www.uea.ac.uk/env/cserge/>
- Centre for Business Relationships, Accountability, Sustainability and Society (BRASS) (Cardiff University): <http://www.brass.cf.ac.uk/projects/>
- Centre for Competition Policy (UEA) (initiated autumn 2004): <http://www.ccp.uea.ac.uk/>

ESRC Research Programmes

ESRC's ***Sustainable Technologies Programme*** (£3 million, 2002–2007) aims to fund innovative and policy-relevant research on the social and economic processes that shape, foster or inhibit more sustainable technologies: <http://www.sustainabletechnologies.ac.uk/>

Projects include:

- Diffusion of Alternative Technologies (wind energy and eco-housing comprising two of three case studies examined)
- Wind Energy – Planning Process
- Fuel Cells – Innovation, Adoption and Use

- Low-Carbon Technologies Innovation Policy (Electricity generation comprises one of two case study areas)
- Household Energy Consumption (Domestic Appliances)
- Oil and Gas – Measuring Sustainability (ESRC contribution to link project)
- Regulation, Markets and Development of Renewable Energy Technologies (Fellowship)
- Integrating Micro-Generation in Networks and Buildings
- Innovation Systems in Renewables
- Community Energy Initiatives
- Social Psychology of Sustainable Consumption (Fellowship)

For more information: <http://www.sustainabletechnologies.ac.uk/projects.htm>

Environment and Human Behaviour Programme (completed)

<http://www.psi.org.uk/ehb/>

Projects include:

- Taxation Futures for Sustainable Mobility
- Wind Energy – Public Attitudes
- Future Comforts: Reconditioning Urban Environments
- Climate Change and Fuel Poverty
- Predicting Thresholds of Social Behavioural Responses to Rapid Climate Change

For more information: <http://www.psi.org.uk/ehb/projectlist.html>

A number of projects with relevance to attitudes and behaviours in the context of energy have also been supported under the ESRC's responsive-mode funding.

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- ¹ Attitudinal change might follow from such measures, although coercion when not accompanied by public support or acceptance might have a hardening effect.
- ² For example, in a recent study into the findings of recent opinion polls on UK public attitudes to energy technologies, McGowan and Sauter (2005) explore how attitudes may also be influenced by proximity to energy generation site, potential differences between regions, political differences, age, gender and social class.
- ³ Framing can be seen as 'a way of selecting, organizing, interpreting and making sense of a complex reality so as to provide guideposts for knowing, analysing, persuading and acting' (see Rein and Schön 1991)
- ⁴ For example, the Save It campaign in the mid-1970s, Helping the Earth Begins at Home in 1991, and the more recent Are You Doing Your Bit?, launched in 1998 (for further discussion, see Owens 2000; Hincliffe 1996). It is too early to evaluate DEFRA's new scheme, Tomorrow's Climate; Today's Challenge, but a key premise of this initiative is that: '[i]ncreasing awareness and understanding of climate change is important if ultimately we are going to be able to change behaviours to tackle the problem' (see <http://www.defra.gov.uk/environment/climatechange/uk/comms/index.htm>).
- ⁵ People may also frame the problem in different ways – for example, in terms of the morality of human interference with the planet, rather than as a scientific issue (for interesting discussions, see Thompson and Rayner 1998; Thompson et al. 1998).
- ⁶ This Swiss study found that variables like interpersonal rules and social networks had more impact on the likelihood that someone would take environmental action than the availability of detailed scientific information and the transfer of scientific knowledge.
- ⁷ Lighting is used for many purposes other than straightforward illumination (see, for example, Wilhite 1997, discussed in Guy (in press)).
- ⁸ Eden (1993) observes that responsibility is very much linked to likelihood of efficacy. Consequently, behaviour may be restricted by a sense of the futility of individual action. Jackson (2005:101) cites a study by Levin (1993) on the reaction to increasing levels of information about environmental problems, which 'concluded that more information led to greater concern, but paradoxically also to greater helplessness'.
- ⁹ This project specifically sought to bring together different social science disciplines to explore the nature and conceptualisations of the so-called 'gap'. For an analysis of opposition to wind farms from different methodological perspectives, see Haggett and Toke (2006).
- ¹⁰ These issues are not new. Energy-related siting conflicts in the 1960s were among those documented in Gregory (1971). Pressure to develop Britain's indigenous energy resources in the 1970s and 1980s resulted in many planning conflicts (see Owens 1985a, 1985b).
- ¹¹ So, for example, some opponents of a biomass plant in Devon simply refused to accept information (based on lifecycle analysis) about the plant's CO₂ mitigation benefits, suggesting 'a mindset in which many of the developer's technical claims have come to be seen as dubious' (see Upham and Shackley 2006:54). On the issue of trust, see also Sinclair and Löfstedt (2001).
- ¹² As is now recognised in Planning Policy Guidance (for an interesting discussion, see Upham and Shackley 2006).
- ¹³ An ESRC-funded Priority Network is exploring public responses and resistance to new energy technologies: Beyond NIMBYism: A Multi-Disciplinary Investigation of Public Engagement with Renewable Energy Technologies (Award no: RES-152-25-1008; award holder P. Devine-Wright).
- ¹⁴ Interestingly, slightly negative attitudes changed into slightly positive ones after people had had the opportunity to cross-examine an expert in the field. The project also involved a survey.
- ¹⁵ A variety of rationales lie behind the advocacy of public participation: see, for example Stirling (2004). Stirling suggests a three-fold typology: (i) normatively, participation in itself is the right thing to do; (ii) instrumentally, it is a better means of achieving

particular outcomes; and (iii) substantively, participation leads to 'better' ends; see also Pelletier et al. (1999).

¹⁶ Q-methodology is an analytic tool for policy analysis, allowing for the empirical study of human subjectivity. For a methodological overview, see Durning (1999). For empirical applications of Q-methodology, see Pelletier et al. (1999) and Webler et al. (2001). An interesting application in the present context is the study by Ellis et al. (2006) of objections to a wind farm development in Northern Ireland.

¹⁷ A study is being conducted for the UK Energy Research Centre by Steve Sorrell and John Dimitropoulos of Science and Technology Policy Research (SPRU), University of Sussex. The Evidence for a Rebound Effect from Improved Energy Efficiency: <http://www.ukerc.ac.uk/content/view/130/187> (accessed July 2006).