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Public values for energy futures: Framing, indeterminacy and policy making

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HIGHLIGHTS

- We argue that public acceptability represents an indeterminate form of uncertainty.
- This means alternative approaches to decision-making are required.
- We introduce a public value set for energy system change.
- We use this as a basis for interrogating current UK policy approaches to transitions.
- Incorporating public values in policy can help tackle uncertainty about acceptability.

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ABSTRACT

In the UK there are strong policy imperatives to transition toward low carbon energy systems but how and in what ways such transitional processes might be realised remains highly uncertain. One key area of uncertainty pertains to public attitudes and acceptability. Though there is wide-ranging research relevant to public acceptability, very little work has unpacked the multiple questions concerning how policy-makers can grapple with and mitigate related uncertainties in efforts to enact energy systems change. In this paper, public acceptability is identified as an indeterminate form of uncertainty that presents particular challenges for policy making. We build on our existing research into public values for energy system change to explore how the outcomes of the project can be applied in thinking through the uncertainties associated with public acceptability. Notably, we illustrate how the public values identified through our research bring into view alternative and quite different problem and solution framings to those currently evident within UK policy. We argue that engagement with a wide range of different framings can offer a basis for better understanding and anticipating public responses to energy system change, ultimately aiding in managing the complex set of uncertainties associated with public acceptability.

1. Introduction

> '...the UK can move to a sustainable low carbon economy without sacrificing living standards… However, it will require the public to accept new infrastructure and changes to the way in which we heat homes, and to be prepared to invest in energy efficiency…' (Department of Energy and Climate Change, DECC, 2011: 12)

In current UK policy it is recognised that major energy system change is required to meet the 2050 80% climate change target and carbon budgets enshrined in the Climate Change Act (2008). Transitions are identified as entailing multiple different forms of uncertainty with one such set of uncertainties pertaining to public acceptability. Here, as the above quote indicates, the uncertainties concern how publics are likely to respond to and engage with system changes. In this paper, we build on our prior research into public values for energy system change to explore how understanding these values is useful for thinking about uncertainties associated with public acceptability in the context of transitions.

The previous research, on which this paper builds, developed a

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synthesis analysis combining qualitative and quantitative datasets in order to reveal the core values that underlie public perspectives on energy system transformation (see Parkhill et al. 2013). The broad premise for this work was that the examination of public perspectives on complex socio-technical issues requires understanding of what underpins people's views; that is, it requires insight into the more *general* positions that underlie *particular* concerns (e.g. Wynne, 1996; Macnaghten, 2010). The term 'values' was used in the research to refer to these more general concerns which underlay specific responses and denote them as representing salient cultural resources (Douglas and Wildavsky, 1982) that people draw upon in forming their preferences.

To illustrate by reference to this previous research, we found that a strong public preference for solar energy was underpinned by a perception that it is 'renewable' 'fair', 'just' and 'clean'. We argued that what is important in terms of public preferences, then, is *why* they favour something, rather than *what* it is they favour, because were solar energy deployed in a way inconsistent with these underlying beliefs, it would likely no longer be supported or acceptable. In essence, we asserted that characterising and understanding the kinds of values people draw on when evaluating a technology or aspect of energy transitions provides more meaningful insight than simply knowing what public attitudes are at a given point in time. These arguments around public values have been delineated in detail elsewhere (see Parkhill et al. 2013).

In this article, we now take this further setting out subsequent analysis undertaken to explore how the derived values set could be applied in managing uncertainties inherent to public acceptability within energy policy decision-making. Specifically, we discuss the uncertainties decision-makers face with regards to how publics will respond to energy system transitions and illustrate how applying our understanding of public values can help with anticipating and managing responses.

Through the paper, we will build on existing analyses of knowledge practices (e.g. Leach et al., 2010) to argue that public acceptability represents a form of indeterminate uncertainty where (necessarily) incomplete knowledge means that responses can never be predicted or known fully in advance. In such contexts multiple authors have argued that conventional expert-led approaches are limited and alternatives to understanding and decision-making are required to anticipate outcomes and build resilience with regards to uncertainty (Jasanoff, 2003; Jasanoff and Kim, 2013; Leach et al., 2007, 2010; Stirling et al., 2007). Central to creating alternative approaches is an understanding of the ways that different people and groups value different aspects of systems, goals or outcomes, and frame the issues in fundamentally different ways (Leach et al., 2010; Jasanoff, 2003; see also Bickerstaff et al., 2008; Butler et al., 2013a).

We apply the outcomes of our previous research to show that in the context of current UK energy policy relatively narrow framings result in a narrower range of options being considered, which do not reflect the complex and dynamic realities associated with public acceptability. In this way, we illustrate how the public values derived from our research offer a basis for an approach that can be used to interrogate different framings and contingencies, build understanding of likely public responses, and ultimately, anticipate outcomes with regards to public acceptability of energy system change.

In the following, we first discuss how we are conceptualising uncertainty with regards to public acceptability setting out our arguments regarding the indeterminate nature of uncertainties in this area. We then briefly outline the research methods and outcomes reported elsewhere (Butler et al. 2013b; Demski et al. 2013; Parkhill et al. 2013) as a basis for the subsequent analysis and discussion. In the core analysis section, we first outline existing UK policy framings and approaches to uncertainty with regards to energy system transitions, before moving to illustrate the utility of the public values we have set out for engaging with uncertainties associated with public acceptability. We propose that the values derived from our previous research can be used to address uncertainty about public acceptability by reinterpreting understandings of problems and solutions through a public lens. We conclude by critically reflecting on current notions of public acceptability, and assumptions that appear to underlie some existing approaches to public engagement within energy policy.

2. Conceptualising uncertainty: public acceptability and indeterminacy

Uncertainty has been defined and conceptualised in a number of different ways ranging from statistical and modelling based approaches, which generally focus on a quantification of uncertainty, through to typologies and definitions that lend themselves more to qualitative analysis (Adam and Groves, 2007; Pidgeon et al., 1992; Stirling, 2008). Given the nature of this paper, we focus on approaches that aim to define uncertainty, offering typologies and broader conceptual tools for thinking about uncertainty in complex policy contexts (Jasanoff, 2003; Jasanoff and Kim, 2013; Leach et al., 2007, 2010; Stirling et al., 2007; Wynne, 1992).

Several authors have defined uncertainty in comparison to other categories of knowledge (for example, see Callon et al., 2009; Jasanoff, 2003; Knight, 1921; Leach et al., 2010; Smithson, 1989; Wynne, 1992). Most of these authors in different ways have distinguished between *risk* and *uncertainty,* as well as delineating further distinctions with regards to different forms of uncertainty, for instance *ignorance* versus *indeterminacy* (Wynne, 1992), *epistemic* versus *aleatory* uncertainty (Knight, 1921). *Risk,* in general, is defined as referring to a knowledge context where relevant factors are well known and can be reliably quantified, as can the chances of different outcomes. *Uncertainty* by contrast tends to be treated as more varied within different categorisations. For some, uncertainty represents a distinct knowledge category to be contrasted with ignorance or indeterminacy (e.g. see Leach et al., 2010; Wynne, 1992). For others uncertainty takes on different forms and is differentiated according to the extent to which it can be reduced or ameliorated (e.g. Knight, 1921; Callon et al., 2009). These different approaches produce similar categorisations for interpreting uncertainty, with most making distinctions between *endemic* forms of uncertainty and *irreducible* or *indeterminate* uncertainties.

Endemic forms of uncertainty pertain to *insufficiencies* of models, *necessities* to set boundaries thus exogenizing and making invisible certain possibilities, *inaccuracy* of measurements, and other issues that systemically generate *ignorance* as a function of constructing knowledge (Collingridge, 1980; Wynne, 1992; Hallegatte et al., 2012; Smithson, 1989). This form of uncertainty only becomes problematic when commitments to act are built on the knowledge as if the endemic limitations (e.g. boundary setting) that result in ignorance do not exist (Wynne, 1992).

Irreducible or indeterminate uncertainties refer to contexts where the causal chains and networks are inherently open and as a consequence there is no scientific means of establishing causality. Moreover, the factors and parameters salient to the emergent outcomes are largely unknown and unpredictable; they do not merely lack definition in a cause and effect system but are open-ended in the sense that outcomes depend on how a whole range intermediate actors will behave (Wynne, 1992; see also Butler, 2008). Put another way, the uncertainties associated are irreducible due to the nature of complex systems: they arise from fundamentally complex or arbitrary behaviour (Hallegatte et al.,

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