
Renewable energy and sociotechnical change: imagined subjectivities of ‘the public’ and their implications

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Abstract. ‘The public’ are potentially implicated in processes of sociotechnical change as political actors who welcome or resist technology development in general, or in particular places and settings. We argue in this paper that the potential influence of public subjectivities on sociotechnical change is realised not only through moments of active participation and protest, but also through ‘the public’ being imagined, given agency, and invoked for various purposes by actors in technical–industrial and policy networks. As a case study we explore the significance of an imagined and anticipated public subjectivity for the development of renewable energy technologies in the UK. We use interviews with a diversity of industry and policy actors to explore how imaginaries of the public are constructed from first-hand and mediated experience and knowledge, and the influence these imagined public subjectivities may have on development trajectories and on actor strategies and activities. We show how the shared expectation of an ever present latent but conditional public hostility to renewable energy project development is seen as shaping the material forms of the technologies, their evolving spatiality, and practices of public engagement involved in obtaining project consent. Implications for the actors we are interested in and for broader questions of democratic practice are considered.

Introduction

For socially and politically significant technologies, such as those enrolled in sustainability and carbon-reduction objectives, questions of ‘public’ subjectivity are important (Flynn and Bellaby, 2007). Charged with the impetus to achieve rapid sociotechnical change, technology promoters have much to gain by having ‘the public’ on-side rather than resistant to innovation and technology implementation. Conventionally, the need to include ‘the public’ in policy, innovation, and implementation processes has been approached through principles and practices of participation, dialogue, and deliberation (Chilvers, 2008; Fiorino, 1990; Renn et al, 1995). An impressive diversity of participatory mechanisms have accordingly been applied at various stages, from the ‘downstream’ of technology diffusion, to the ‘upstream’ of early experimentation and vision development (Macnaghten et al, 2006; Wilsdon and Willis, 2004), reaching across various dimensions of science and technology governance (Gottweis, 2008; Hajendijk and Irwin, 2006; Irwin, 2006). These participatory mechanisms have been researched and evaluated with divergent, and sometimes antagonistic, positions adopted concerning their application and achievements (Hendriks, 2008; Irwin, 2007; Petts, 2008; Stirling, 2008; Wynne, 2006).

Although important, such formal moments of engagement are, however, only part of the picture of how ‘the public’—a differentiated, fluid, but politically meaningful, category in civic discourse (Marres, 2005; Sheller, 2004; Staeheli and Mitchell, 2007)—factors

into processes of sociotechnical change. Following Maranta et al's (2003) notion of 'imagined laypersons', we argue in this paper that 'the public' are not *only* embroiled through participatory events and the forms of protest action that erupt around specific issues and projects: 'the public' also exist as imaginaries given agency and invoked for strategic purposes by actors in technical–industrial and policy networks (Burningham et al, 2007). Our contention is that through such actors constructing shared narratives and 'repertoires', shaped both by direct and by mediated interactions, an imagined, anticipated public is produced, given voice, and assigned a presumed subjectivity. This imagined public thus becomes an actor with agency and political significance, available to be invoked in everyday as well as more overtly significant decision-making processes. Others may consequently orientate themselves in relation to this imagined public, and shift or adapt the work that they do and the strategies that they employ. To use the terminology of Rip and Kemp (1998, page 331) (discussed further below) the societal embedding or 'socioware' of new technology may be *anticipated* in some way and included *within*, rather than left external to, processes of innovation and technology development and deployment.

In this paper we explore the significance and consequences of an imagined and anticipated public subjectivity for processes of sociotechnical change through an examination of the case of renewable energy technologies (RETs). This cluster of diverse technologies is increasingly capable of implementation in multiple and hybrid organisational modes and at diverse scales (Walker and Cass, 2007). They are categorised together in part because of the way in which policy targets are set around energy production and carbon reduction with, for example, the European Union having a binding target of 20% of energy generation coming from renewables by 2020, including a target for the UK of 15% by 2020. RETs are politically significant, and the success with which they are proven efficient and reliable, developed, and implemented is important, both commercially to those involved in or working for the renewables industry and its technology sectors, and to policy communities at various levels (van den Bergh and Bruinsma, 2008).

In terms of public responses to RETs, considerable attention has been given to the apparent 'social gap' (Bell et al, 2005; Walker, 1995) that has emerged between widespread public support for renewable energy in general and local opposition to specific project proposals—in particular, to wind-energy developments (van der Horst, 2007; Wolsink, 2000; 2007). This experience, and in particular the intensity of media coverage that opposition to wind farms has generated, has positioned RETs, like other forms of energy generation, as examples, potentially at least, of 'locally unwanted land uses' (Freudenberg and Pastor, 1992). Drawing on existing narratives of local resistance to development, the media, industry, and policy actors have frequently portrayed opposition to wind farms and other projects as 'NIMBY' (not in my backyard) in character (Devine-Wright, 2005; van der Horst, 2007; Wolsink, 2007), with associated implications of selfishness, shortsightedness, and self-interest (Burningham et al, 2006). If this characterisation permeates actors involved with the development of RETs, becoming integral to their imagined public subjectivity, we would expect it in some way to 'do work', and potentially shape the practices that they engage in. Whether there is evidence of such characterisation at work, and the consequence that actors see as following for the shaping of technology development and deployment, is our key focus in this paper. Such an analysis has to date been lacking in the literature concerned with innovation and sociotechnical change applied to RETs. Even more sophisticated accounts, such as that provided by Garud and Karnoe (2003) on the development of wind technologies in Denmark and the USA, go only as far as recognising the agency of 'users' and 'regulators' in distributed multiactor innovation processes.

We begin by considering the notion and potential consequences of an imagined public in more detail. We then outline the empirical interview work undertaken with a diversity of actors within the renewable energy sector. The extent to which a discourse of public subjectivity is shared amongst these actors, and the various ways in which this may have shaped the development and deployment of RETs, are then explored.

‘The public’ and sociotechnical networks

The expectation that actors in sociotechnical networks will work with ‘the public’ in mind is entirely familiar where the focus is on products for which publics act as consumers and users (Akrich, 1995; Flynn, 2007; Meyers and Althaide, 1991). Assessment of how the technological product is likely to be perceived, valued, and used by potential consumers (a likely segment of the wider public) is part of the work that goes on—in financial decision making, design, engineering, marketing—before and after material artefacts become available for purchase. Accordingly, the business and marketing literature is replete with mechanisms and tools for gathering ‘public as consumer’ subjectivity, such as demand forecasting, trial marketing, focus groups, interaction with user groups, and the like. This territory has been explored by Akrich (1995), who constructed an inventory of the varied explicit and implicit methods employed by “system designers to develop, promote and impose a particular representation of the user” (page 175). Studies of the processes of innovation of products for consumer markets have shown how expectations of users have been part of the ‘inscription’ (Akrich, 1992) of a vision of the world in the technical content of a new artefact (Woolgar, 1991), and how the innovation of artefacts is continued into their diffusion and use (Bijker, 1992; Cowan, 1987; Garud and Karnoe, 2003).

Such sensitivity to ‘the public’ is not necessarily as inherent when the technology being produced is not for direct purchase by the public consumer, but is for other purposes. This does not, though, make ‘the public’ irrelevant as they can play other roles—not as consumers, but as citizens or neighbours (Burningham et al, 2007), potentially overtly *political* actors who express opinions about, or engage in opposition to, or support what is being produced, used by others, located, and operated in particular contexts. Here, the incorporation of public subjectivity into the work of the ‘behind the scenes’ network of actors will depend on the extent to which the *political* potential of citizens and neighbours becomes seen as important. This potential may be significant in various ways. For example, it might be important to the realisation of specific organisational aims, such as achieving regulatory approval or permission to build; or it might be significant to realising wider organisational aspirations or ethical commitments, for example, under a corporate social responsibility agenda (Burningham et al, 2007).

Rip and Kemp (1998) use the notion of ‘socioware’ to capture the social politics of technology implementation, distinguishing this from the hardware, software, and ‘orgware’ of innovation processes. ‘Socioware’, they state, “includes the societal embedding of a technology in concrete social contexts as part of the development of technology” (page 331). They then comment:

“For some technologies... public reactions have forced developers to redesign their systems. Learning from these experiences they sometimes anticipate public acceptability actively. In other words they include socioware in the design and development of their technology” (page 331).

Maranta et al (2003) provide a more sophisticated conceptualisation in considering how ‘imagined lay persons’ are part of the way in which lay–expert interactions are framed and circumscribed and encounters are anticipated. Crucially, they argue that ‘imagined lay persons’ are conceptualised rather than explicit, ‘functional constructs’ in expertise, manifest in the products and actions of those who are doing the imagining, and according them more or less significance, competence, and differentiation. It is with these notions of imagination and anticipation, and their ramifications for the development and implementation of RETs, that we are concerned.

Methodology

In order to research how ‘the public’ factors into the process of renewable energy development, a number of different strategies could be taken. Our approach was to develop a research design which looked across multiple technologies and multiple actor roles. Although it did not provide the depth of a research strategy focused, for example, on a particular technology or a particular functional role (such as design, marketing, or finance), this approach had a number of purposes and advantages. First, we were able to explore the extent to which there was a shared repertoire or discourse about ‘the public’ working across different actors involved in the development of RET. Second, we were able to look for evidence of ‘reading across’ or learning between technology sectors which are at different stages of development. Third, we sought to identify a range of different types of responses that actors see as being made or not made by themselves and others in this area. At the same time, though, we need to be aware that interviews are limited in their capacity to capture or represent the many different settings in which decisions are being made, conversations are taking place and work is being done. We can obtain glimpses and access performed articulations and explanations, but that is all. This does not entirely undermine the evidence we can draw on, but reminds us of the need to guard against simplistic readings.

The data collection involved forty-two semistructured interviews, undertaken in 2007. The interviewees were involved with at least one of the technologies of wind power, biomass energy, marine energy, and solar energy; many were involved with multiple technologies extending across and beyond this list. The organisational roles of the interviewees fell within the categories listed in table 1. These categories cover the main actors both within different parts of the renewable energy industry and within policy development and debates.⁽¹⁾ Some interviewees fell within more than one category (as indicated in table 1). In each case, we were interested to find out how ‘the public’ figured in their thinking, both in terms of their own specific work roles and responsibilities, and in terms of their wider observations about, and explanations for, the ways that different RETs have evolved.

The interview transcripts (and in one case notes as the interviewee did not wish to be recorded) were coded by two members of the research team using Max QDA2 software. All transcripts were also separately read and key analytical themes identified by another member of the team. In the discussion that follows, quotes from discussion in the interviews are provided, and interviewees are identified by their primary and, where relevant, secondary role category.

⁽¹⁾The interviewees falling into the developer, finance, and marketing and PR categories were selected from companies concerned with the commercial development of large-scale RET projects. We were not able within this study to cover actors orientated primarily towards smaller scale community renewables projects (for discussion of these, see Walker et al, 2007).

Table 1. Profile of interviewees.

Role category	Description of role	Number of interviewees ^a
Developers	Implementation of RET in specific places: both major utilities and smaller independents ^b	7 (2)
Manufacturers	Design, engineering and manufacturing of RET	4
Consultants	Employed in implementation of RET for developers; various specific roles including environmental assessment, project management, network connections	5 (2)
Finance	Provide finance for RET projects including banks and venture capitalists	4
Marketing and PR	Marketing of RET and handling of PR for project developers	3 (1)
Policy and regulators	Development and implementation of RET policy at national and regional levels	5
NGOs and interest groups	Organisations with specific interests, including trade bodies, trade unions, environmental groups	9 (2)
Politicians	With specific roles within government related to RET or on relevant committees; from each nation of UK	5

^a Numbers in parentheses indicate subsidiary role of an interviewee in that category with a primary role in another, eg, secondary role of consultant with primary role of interest group.

^b RET—renewable energy technology.

The public constructed and imagined

A first step in exploring what the consequences of an imagined public subjectivity might be is to identify the existence, nature, and content of this imagination across different actors involved in RET development. All of the interviewees were asked to talk about how they viewed ‘the public’, what they understood by the term, and what they thought about public views of RET. Most talked readily, at least for some of the time, about ‘the public’ as a general category, making broad statements about public opinion, attitudes, and responses. The term and the associated language through which public subjectivity is conveyed in this sense appeared familiar, easily articulated, and relevant to the subject of RET development. Some interviewees, however, quickly problematised the notion of a homogenous public or set of typical public views, stressing the difficulty of generalising about ‘the public’ as a whole. In so doing they were not challenging the notion that public subjectivity about RET existed but, rather, that distinctions between different social groups, or between different notions of ‘the public’ in different contexts, needed to be made. Their understanding and invocation of what ‘the public’ constituted was relatively sophisticated, in contrast with other interviewees who maintained a more simplifying narrative about the public voice.

In the developer, marketing, and most of the consultant and NGO interviews, discussion about the public was sustained at some length. They were able to talk about their first-hand knowledge of public reactions and responses, drawing on situated

experience on the ground (in the UK and in some cases overseas) to form more general expectations about when, where, and why public reactions of different forms would materialise. Others, whose work roles kept them at more of a distance from project implementation, typically found it harder to draw on specific evidence and knowledge about the public and their viewpoints. Instead, they frequently made reference to what they heard in the media, in a few cases to pieces of research and opinion surveys, and, significantly, to evidence gained from interactions within industry/sector networks. In this last case various interviewees, including consultants, banks, manufacturers, and industry NGOs, recounted narratives of public responses gained from others—in particular, developers with whom they worked—providing some indication of the types of circulations and mediation of knowledge operating within their networks. For example:

“We can’t sort of get ourselves too directly involved in the public engagement process, but... we’re in wind so we know pretty much every development in the country. We kind of know what’s going on. We know the gossip. We know who talks to who. Everyone talks to us. We kind of know where it’s generally good and when it’s generally bad” (interview 36, bank).

In terms of the nature of imagined and expected public subjectivity about RET, patterns both of generalisation and of differentiation again emerged. When generalisations were made these were typically to present ‘the public’ as being increasingly supportive of renewable energy, at least to some degree, as a broad idea and policy commitment. Interviewees variously refer to ‘the public demand for clean energy’, a ‘groundswell of opinion’, ‘changing mindsets’, and increasing ‘social awareness’, connected for some to changing views on climate change, investment in green electricity tariffs, and enthusiasm for ‘DIY’ microgeneration technologies. In every case, though, this notion of a broadly supportive public was set against the expectation that opposition and resistance to specific development proposals in particular places could readily materialise. Here, a more differentiated view of ‘the public’ was typically taken by interviewees, with discussion centring on the particular local conditions that can generate conflict; the significance of political and social context; the role of vociferous minorities compared with the silent (supportive or apathetic) majority; the capture of the media by key local and national figures; the attitudes of locals as opposed to ‘incomers’, rural compared with urban populations, English compared with Scottish or Welsh, British compared with publics overseas; and so on.

Differentiations were also made by technology. Every interviewee, without exception, made reference to wind energy when talking about negative public attitudes and opposition to project development. Although there were generalising statements about people ‘just not liking wind turbines’, distinctions were also made between onshore and offshore wind, and between different scales and modes of wind-farm project—smaller scale onshore projects, particularly those which are connected closely to the community through share ownership or other mechanisms, being more likely to be tolerated or responded to positively than large-scale utility-led projects. Biomass projects of different forms were similarly considered to have the potential to generate substantial local opposition [such as the Winkleigh biomass proposal discussed by Upham and Shackley (2006) and Upreti and van der Horst (2004)], but also in some cases to be largely uncontroversial and hidden from public view. Interviewees who commented on marine technologies (tidal stream and wave power) saw significant public support as currently existing both for the principle of the technology and for the few pilot schemes that had been deployed. However, for those most closely involved there was a clear recognition that adverse public reactions could materialise for these technologies in the future.

Several conclusions can be drawn from this overview of how the public and public subjectivity were talked about in the interviews. First, there is a ready notion both of the public and of public subjectivity amongst a diversity of actors involved in RET development, although this is differentiated in various ways, sometimes to a quite sophisticated degree. Second, the articulations of public subjectivity that emerge from the interview accounts have a broad parallel with the NIMBY and ‘social gap’ representation of public views—in other words, as being broadly positive about the principle of renewable energy, but potentially deeply hostile to its local implementation. Third, although for a few interviewees, particularly those focused primarily on wind energy, this hostility is portrayed as fairly permanently and universally embedded, for most others it is seen as conditional on a wide array of factors which shape the local characteristics and conditions of project development.

Whether this amounts to a shared discourse or repertoire amongst the actors we talked to is open to interpretation. Although we have identified differences between interview accounts, in one way they do all share a common orientation: that the materialisation both of negative responses and of active opposition is a ‘real and present danger’ for RET development. This latent, potential hostility of the imagined public is universally evident, coming and going across the interviewees and explained in different ways, but ruled out only for very small-scale and unobtrusive forms of technology installation (such as roof-mounted solar panels or heat pumps). We explore in the rest of this paper how this common orientation is seen as being influential in shaping various aspects of RET evolution and development. However, we need to do this not only by focusing on what this shared discourse says about the possibility of opposition, but also by focusing on the converse: the possibility of support. If opposition was to be expected always and everywhere, if it was inevitable rather than latent, then the possibility of acting in various ways to minimise or avoid its materialisation might be discounted. If there is, as we have found, a conditionality involved; then the prospect of being able to act and progress in ‘better ways’ is open and has the potential to become significant in the development of RET technologies. It is to these possibilities and their significance that we now turn.

The influence of ‘the public’ on technology trajectories

When asked what they thought was having an influence on the trajectories and development of RETS, very few interviewees from across the different technologies and role categories, immediately gave the public any particular significance. Factors such as economic performance, market conditions, and policy and regulatory measures were identified most readily as dominating the way in which RETs were evolving. The few interviewees who did give an immediate agency to ‘the public’, not surprisingly, focused on the deployment of onshore wind. For example:

“The people who are campaigning against wind farms particularly have been quite powerful and indeed have got a powerful impact on the deployment of at least onshore wind” (interview 27, policy and regulation).

For a wind engineer–developer with a clear imagination of a ‘British’ public, as opposed to a Danish or German one, there was a powerful ‘mass movement’ in the UK blocking wind-farm developments:

“You know, so if you stand back from it, you think that Danes, Germans, Dutch people live generally much closer to wind turbines than people in this country and there isn’t a mass movement against them. It says to you that there’s nothing different here in terms of physics, so it is much more that there is some sort of deep-seated antagonism within a certain sector of society against them. Which doesn’t exist, to the same extent, in these other countries. Which then, for me,

says it comes back down to the sort of people we are as the British” (interview 4, developer).

As the interviews progressed, however, such initial responses were added to and supplemented with more varied and subtle reflections on how expectations of ‘the public’ had shaped both the dynamics and outcomes achieved within particular RET sectors and the interviewees’ own work practices and organisational strategies. The various impacts and influences that emerged from across the interviews are organised in what follows into three categories, moving crudely from more ‘upstream’ phases of technological engineering and design through to more ‘downstream’ processes of project implementation.

Influencing material form

The first possibility that we explored in the analysis of the interviews was that ‘the public’ could have some influence on the artefacts of RET—on the material form of the technological objects which perform the generation of energy—turbines, biomass burners, solar panels, and so on. As the worlds of mechanical and electrical engineering and technical design are culturally and discursively (if not institutionally and physically) isolated from the public sphere, there was significant resistance to pursuing the possibility of ‘the public’ being an ‘engineering issue’:

“The renewable energy developers are not really much more socially attuned than other technology developers in the sense that they go about it thinking that they’ll get the technology and then sort out the public, the public relations afterwards” (interview 9, NGO).

“I don’t think they [the public] have a huge impact on the development process because it’s often at that stage we’re still looking at the engineering issues in terms of bringing the technologies forward, bringing them on-stream, you’re looking at engineering issues” (interview 29, government agency).

Not all interviewees agreed with these positions, however, identifying, sometimes after further reflection, various ways in which sensitivity to public concerns had shaped technology development. For both wind and biomass energy, influences were generally seen as being on matters of aesthetics and appearance, rather than on ‘real engineering’ (interview 29, government agency), and involved rendering the technology less visible, less heard, and more ‘attractive’. On the other hand, interviewees also pointed to the move towards larger and larger turbines which they saw as driven by economics and as flying in the face of a concern for public responses: as one commented, “the trend towards bigger and bigger turbines has not come from public pressure” (interview 15, consultant). Although most of the talk in relation to wind power was of this form—including questions of wind-farm layout and orientation which were open to some degree of negotiation with local communities—two interviewees did look back to an earlier stage of wind-turbine development at which decisions about the dominant material form of technology were taken:

“I would say public reaction has prevented the deployment of two-bladed turbines ... so fifteen years ago they were part of the choice, some people were making two, some people were making three, and as a result of a visual intrusion of the two bladed and the higher noise, they’ve gone” (interview 17, consultant).

Although such a claim might well be challenged in terms of the primary reasons for the lack of deployment of two-blade designs (including ‘yaw’ effects associated with even numbers of turbine blades), it suggests at least some sensitivity to public reactions (experienced or imagined) in the historic and reproduced lock-in of the three-blade turbine [a lock-in which some continue to regret on economic and design grounds (Gipe, 2003)].

Given this, it was particularly striking in each of the interviews with marine (wave and tidal) technology manufacturers currently involved with the first trial deployments of commercial-scale devices to see a strong sensitivity to the imagined possibility of adverse public reactions—a sensitivity which was repeatedly cross-referenced to the experiences of the wind sector. In terms of design issues, this sensitivity took a number of forms. First, an emphasis on what was ‘visible’, with a low height above the waves seen as providing a significant advantage between competing technologies and competing designs:

“Well I have to say I think obviously one of the things in our advantage is, is potentially being out of sight and out of mind. We have a low profile in the water so in terms of the visual impact it’s pretty, pretty low” (interview 24, manufacturer).

“I think if any of our competitors succeed in developing technologies which don’t actually have a visual impact, that could have an impact [on their success]” (interview 23, manufacturer).

Second, there was a concern for finding designs which reduced the possibility of an impact on aquatic mammals—particularly those mammals which have strong public sympathies and emotional associations (impacts on sharks, for instance, were thought unlikely to provoke public sympathies in contrast with impacts on cetaceans and seals).

“Like I say, I think I mentioned before if we actually had a significant impact on large aquatic life, then that would change perception” (interview 23, manufacturer).

“If a particular technology caused real problems for dolphins and you know, porpoises, that type of thing, the statutory authorities would be concerned if those species were protected and that would drive, could stoke up public pressure” (interview 20, consultant).

This evidence suggests at least some strategic inclusion of an anticipated imagined public into ‘upstream’ stages of engineering and design, reflecting an ethos of “you’ve got to get the right perception from day one” (interview 23, manufacturer) and a concern that the ‘real and present danger’ of public resistance could materialise. However, for one interviewee, still not enough attention was being given to what he expected from his imagined and anticipated future public, and little evidence that learning had really gone on:

“So to me it’s very much like wind was twenty years ago where it’s all to do with whether the turbines will actually work rather than the product. Although I do anticipate significant opposition on the tidal front from the public, whereas I don’t anticipate it on the wave front” (interview 17, consultant).

Shaping spatialities

A second way in which the public were seen to be relevant to the development of RET was in the spatiality of their deployment. Although most RETs are locationally tied to places where a resource is available (such as strong tidal currents or high wind speeds), there are still always choices as to where that resource is to be tapped and where it is left unexploited (Walker, 1997). Here, there was evidence of expectations of and sensitivity to ‘the public’ feeding in at a number of different levels.

Both for wind power and for biomass technologies, there was discussion of the detail of achieving separation distances from nearest houses, based usually around a physical rationale of keeping noise levels and landscape impacts ‘acceptable’, as codified in ‘best practice’ guidance. One wind-farm developer made it clear that if these standards could not, in their judgment, be achieved at a particular site “then it might be one that we leave alone” (interview 1, developer). Wider spatially organised strategic shifts with a more political rationale were also linked to the public. The major

move in the UK towards the development of offshore rather than onshore wind [with the UK overtaking Denmark as the largest offshore generator as of October 2008 (Jha, 2008)], was repeatedly attributed, at least in part, to the assumption that public resistance would be less problematic as the turbines would be at sea rather than in people's backyards (Haggett, 2008). Such comments ranged across different interviewees and were linked variously to proximity, visibility, landscape perceptions, and emotions:

“I think obviously we have a policy and preference for large wind farms offshore, because they're out of sight out of mind” (interview 31, politician).

“[Offshore] there's more space and you can put larger devices. Onshore you are constrained by both physical characteristics and emotional characteristics” (interview 22, manufacturer).

For one interviewee this pressure to distance technologies from people and reduce visibility had not only pushed from onshore to offshore wind, but also then to marine technologies. Success had become increasingly measured by the need to keep 'the public' on-side, over and above more technological drivers:

“a very vocal minority of people for onshore is pushing it offshore and I think that you know, the, the pressure again on offshore is saying, is saying well these are going to look ugly you know.... So again it's then people starting to look at things like wave farms and, you know, a technology that you can't see that's under the sea.... I do think that we may not be developing the most efficient or effective technologies, but we may be developing technologies which are actually more likely to be successful because they're going to be less visible” (interview 20, consultant).

Other locational strategies were also attributed to expectations of public opposition. 'Repowering'—the reuse of existing or historic locations of RET for the installation of newer technology—was linked to the lesser disruption and public reaction this was expected to create than if a new location were used. This was seen as a strategy at work both in the use of old water mills, or leats and weirs, for new hydroelectric installations, and in the repowering of early phase wind farms with newer, larger, and more profitable turbines (Reiche and Bechberger, 2004). More radically, for one wind developer likening experiences with getting planning permission to the First World War, the spatial strategy they were following was to move their work overseas:

“You know, it's a bit like the Battle of the Somme or something. You can probably win a bit, lose a bit, take a couple of trenches but you ain't going to—You know, there isn't going to be the great push and the grand breakthrough. It's very like the First World War in that sense. [Laughs]... which is why we as a company don't put huge reliance on the future of the UK market. It's why we're in China and elsewhere, because that's my strategic view on the subject” (interview 4, developer).

Although such strategic reactions to the experience of public opposition to wind farms might be expected from wind-farm developers, it was striking to see this also appearing in interviews with those financing project development—the investment banks who might be assumed to operate at some distance from the local politics of planning disputes. Indeed, out of all the interviewees, the most acute and strident sensitivity to public opposition was shown by those from the financial sector, who factored this to varying degrees into their capital-investment decisions (related both to wind and to waste-to-energy projects):

“if we perceive that there is local, strong local opposition to a project, we won't touch it, we would not touch it.... I would say, very strongly that if there was strong public reaction then we would not finance it” (interview 38, finance).

Interviewer: “Does public demand or sensitivity play any part in what you finance and what you don't?”

Interviewee: “We definitely take it into consideration, we do. Remember, you know, we are a bank and we’ve got shareholders and that’s the population, you know” (interview 37).

As evident in this second quote, the drivers behind such sensitivity were not only the financial return that was at risk if planning permission was not achieved, but also the wider reputational risk of being associated with controversial projects. For one of the banks we interviewed, which particularly focused on making investments that would not conflict with its corporate social responsibility policy, being concerned about local politics went as far as monitoring the press and making trips into the local community in order to pick up if there was likely to be opposition:

“How else do we find out? We’re in hotels, we’re asking questions, we always ask questions about the wind farm, we pick up the local newspapers. ... the rest is a bit more sort of, general, sort of touchy-feely—by being in the community you get a sense of, you know, is there opposition; so we’ll visit the site often, at least on two or three occasions... if we get a sniff then we’ll follow it further. A sniff there’s problems then we’ll follow this thing up... if we don’t get a sniff then we’ll probably move on” (interview 38, finance).

Here we can see not just the investment policies of the bank being shaped by expectations of a potentially problematic public, but also the working practices of being a banker involved in wind-farm financing. Sensitivity to the public has here become part of routinised processes of investigation, evaluation, and decision making, determining where capital is to be made available and where it is to be withheld.

Driving public engagement

Moving towards the implementation phases of proposing and seeking planning permission for projects in particular localities, we enter the more familiar territory of the actions taken by developers to inform, consult, and communicate with local people. There is much research tracing how such engagements have become part of the standard practice for developers of all kinds of projects—driven in part by legislative requirements, but also by other motives for enabling public participation (Cass, 2006; CSE and Capener, 2007). Not surprisingly, across all of our interviews, and in discussion concerned with each of the different RETs (except for solar), the importance of public engagement was stressed—to the point that for most it had become entirely normalized and part of standard industry practice (Hinshelwood and McCallum, 2001); as one interviewee commented

“doing it is kind of expected and its part of due process” (interview 19, consultant). The motives given for undertaking engagement activities were mostly highly instrumental, focused on obtaining planning permission, speeding up decision processes, and minimising complications because of an anticipation that these could arise from antagonistic public responses. Many interviewees observed how engagement practices had changed, improved, and become more effective in terms of enabling what they felt to be constructive dialogue and thereby securing planning permission. For example, a biomass developer directly linked getting the public engagement right with the success they had had with a recent project:

“And with biogas we know that there have been public objections to very large projects. ... oh it’s gas, it’s going to smell, it’s going to explode, it’s dangerous, and there’ll be lorries taking smelly waste around—those sorts of issues. But we’ve not come across it ourselves. So, for instance, we’ve just built the [name] biowaste plant which is taking in waste and there were no public objections to it... because there was a huge amount of public engagement at the right time” (interview 2, developer).

In this respect there was strong evidence of feedback and learning at work, with strategies being developed and rethought as a result of earlier encounters with 'difficult' publics and learning taking place between technology sectors—such as, as noted earlier, from the downstream experiences of wind, to the upstream strategies of marine. Each of the developers, and the specialist consultants they employed to carry out marketing and PR activities, had evolved quite sophisticated approaches to carrying out local engagement: use of a range of techniques and strategies; modulation of the timing of different interventions; identification of key local gatekeepers and stakeholders; and so on. These included finding ways of connecting with people who could be mobilised as supporters—reflecting a conception of vociferous public opposition typically being in the minority whereas local supporters were the silent majority whose voice was not being heard. For example, one developer used the 'tip of the iceberg' metaphor to convey this imagined profile of public subjectivities and agencies:

"it's very, very easy to get ten negative letters but bloody difficult to get one positive one, so... it's great when we can engage people who'll help us to do that. 'Cos obviously it's better if it comes independently rather than, obviously solicited... so that's very, very, helpful, I think, and is seen as an indicator of the tip of the iceberg of the positive opinion. That's all you ever see, is that tip, but you've got to see the tip and mobilise that tip" (interview 4, developer).

Another way in which conceptions of the public were evidently shaping engagement strategies and practices was in the increasing use of 'community benefits' as a way of winning over local opinion. This is a fairly recent phenomenon and can take a number of different forms, including: the provision of a one-off payment to local people, providing an annual amount of money to a local organization, such as the parish council, to spend on local needs; or setting up a share-ownership arrangement so that local people can invest in the project (CSE et al, 2007). For some developers having a 'community-benefits package' has now become standard practice—either negotiated on a project-by-project basis or following a fairly standard formula. For example:

"we have a community-benefits package that runs alongside almost every single project we put in.... That tends to involve money from the revenue of the wind farm on an annual basis or rolled off into a lump sum and handed over on commissioning" (interview 40, marketing and PR).

"Often we offer about a thousand pounds per megawatt installed, so the wind farm I mentioned is about thirty megawatts, so we'd be offering about thirty thousand pounds per annum for the lifetime of the wind farm to the local community really to do with as they wish within certain parameters" (interview 1, developer).

Although some interviewees talked about such benefits as 'giving something back' as a right to local people, and about developing community ownership and empowerment, there was generally a far more utilitarian conception at work which understood public subjectivity and expressed opposition as being driven by the balance of costs and benefits. If this balance could be redressed through a monetary transaction, then anticipated opposition could be counteracted and potentially overcome:

"I know it sounds a bit trite but money does talk.... the reason they're doing it is not because they've got any altruistic aspirations, it's because they get money and so the other way of dealing with it is to bribe people to accept it [Laughs] in the same way as you'd be bribed for having a car factory or a paint plant in your community... it's going to be a small amount of money at the end of the day but I think it helps" (interview 39, finance).

It followed also that there was a circulation of expectations that such provision of benefits (or ‘bribery’) would do work and help to smooth the pathway for project proposals—potentially offering a solution that would help to keep anticipated public antagonism in a latent rather than realised condition. In this way, as with engagement more generally, public subjectivities are not seen as fixed and absolute but, rather, open to some degree of shaping, influence, and modulation.

Conclusion

We have argued in this paper that, in order to understand how public subjectivities have a role in shaping the development of politically and commercially significant technologies such as RETs, it is necessary to look beyond the particular and direct local impacts of participatory processes or oppositional campaigns. Drawing on the notion of ‘imagined lay persons’ (Maranta et al, 2003), we have argued that feedback processes and the longer term development of shared repertoires and expectations amongst actors in technical–industrial and policy networks mean that ‘the public’, as constructed and imagined, will potentially be present at many moments along evolving trajectories of technology development and deployment. Indeed, depending on how the subjectivity and agency of the public is anticipated and internalised into organisational strategies and working practices of different actors within and across sectoral networks, this imagined public might be of greater long-term significance than the ‘real’ versions of specific publics encountered in meeting rooms and community halls. The real and the imagined are clearly not disconnected here, but neither are they necessarily the same.

Using empirical material gathered through interviews, we have explored these ideas in the context of the ongoing development of renewable energy technologies in the UK. From our analysis we draw two, interrelated, conclusions. First, that there is evidence of a shared imagination or anticipation of ‘the public’ at work amongst the varied actors that we talked to, developed in some cases through direct encounters with local publics but also through the circulation of second-hand narratives, media reporting, and so on. This was not always a simplistic anticipation of NIMBYs anywhere and everywhere, but a clear expectation of the possibility of hostility to project implementation—a real and present danger—latent, sometimes materialising amongst particular publics, for particular reasons and in particular circumstances and places; and set alongside a positive general public orientation to the idea of generating energy in renewable ways. Second, we identified a range of implications and influences that this shared imagination has had, and continues to have, for different aspects of the development of RETs in the UK—to a limited degree for the engineering and design of technical objects, and more substantially for the spatial strategies of deployment (locational investment decisions, repowering, moving offshore or overseas) and the processes of engagement and benefit sharing with local communities. In these ways, ‘the public’ have become, to some degree and for good or bad, inscribed in the evolving form, distribution, and politics of a key category of sustainable-technology development.

How deeply embedded this inscription might be, though, is difficult to establish. The imagined public appears to have become part of the process of sociotechnical change, but how influential it is when set alongside other actors (real or anticipated) and other influences on systemic change we cannot be sure: other research strategies and methodologies are required for this to be more reliably revealed. In this sense, our work opens up a set of possibilities for future work more deeply and longitudinally embedded within specific (technical, sectoral, or regional) industry–policy RET networks, tracking the ways in which the imagined public are invoked at key decision-making points,

and the impact these invocations achieve. There are also intriguing questions to ask relating to how the public might be imagined and invoked differently within the growing number of community-based projects and social enterprises that are taking up opportunities for RET deployment (Walker et al, 2007). These entail more organic, distributed, or grassroots forms of innovation than the centralised processes we have focused on, and have more normative drivers, which are likely to start from a quite different set of anticipations of the subjectivities and agencies of local people (Seyfang and Smith, 2007; Walker and Devine-Wright, 2008).

We can finish by speculating on some of the wider implications our arguments and empirical work open up. First, the implications for the different actors we have been interested in. For oppositional publics, those engaging in resistance to renewable-energy projects, our analysis suggests that the accumulation of local ‘militant particularisms’ (Featherstone, 2005) may be having wider impacts which extend beyond the success or failure of specific struggles. If development work is being moved offshore, if community-benefit packages are now standard, and if getting capital investment from banks is now subject to having a receptive local public—or at least a good engagement process—then these might each be seen as successful outcomes of accumulated local activism. For the renewables industry, and those who for various reasons are seeking development and expansion of RET, we might also be to see the internalising of public concerns into strategies and practices as a positive development if the consequences are that new technologies (such as marine) run into less difficulty, fewer projects are resisted, more planning permissions are achieved, and more megawatts of generation capacity are installed. Many of our interviewees clearly feel that trying to anticipate and work with public concerns is part of what will bring success. On the other hand, if anticipation is breeding caution and strategies of avoidance by moving activity and investment to other locations or purposes then, in terms of achieving climate-change and energy targets, these are less welcome developments.

Second, we can speculate as to the wider democratic implications of our analysis. On the one hand, the incorporation of imagined publics and their subjectivities into multiple moments of practice and decision making might be seen as bringing the social into a more fundamental interaction with the technical: public participation ‘by proxy’, extending beyond formal events and encounters, so that the public voice is present along with others (upstream and downstream) even when it appears to be excluded. On the other hand, the imaginaries and anticipations that circulate amongst industry and policy actors are ‘functional constructs’ and ‘aggregates’ (Maranta et al, 2003), and as such are partial, generalising, and stereotypical. They are not a “sociologically comprehensive representation” (Maranta et al, 2003, page 154). But how could we expect otherwise? All modes of public participation can only be partially inclusive and generate incomplete representations of public subjectivity of some form, which may or may not then circulate and become influential. In this sense, the literature on public dialogue and engagement with sociotechnical change, even in its more critical modes (Irwin, 2007), has too often failed to go beyond the surface of staged engagement events to trace how these both draw from and create imaginations and representations of ‘the public’ and its subjectivities amongst significant actor networks.

A further step forward here could be to take on board more fully the ‘phantom-like’ qualities of the public (Latour, 2005; Lippmann, 1925; Marres, 2005). Marres (2005) insightfully argues that conceiving ‘the public’ as an ungraspable, ghostly phantom or mirage need not diminish it or lead to a nihilistic and negative view of its agency. Rather, this “ungraspability may be an aspect of agency” (page 216), such that it is precisely the phantom-like, virtual, collective, anonymous qualities of the public that “make things happen that perhaps wouldn’t happen otherwise” (page 216).

Following this line of reasoning, we may (as in this paper) attempt to observe the processes through which ‘the public’ phantom becomes imagined, invoked, and contingently made real and apparently influential—but in that process we should not expect all to become transparent and self-evident, or to diminish the capacity for continual reformation and reimagination. Indeed, it is these slippery qualities that make ‘the public’ and its subjectivities one of the core materials of politics and political work—both within and beyond questions of sociotechnical change. Arguing over whether there are some processes of constructing the imagined public, some ways of knowing subjectivities, and some means by which the public achieves agency that are ‘better’ than others—which are to be encouraged whilst others are resisted—is core to political debate. Such arguments are not abstract ones, as matters of principle cannot in practice be easily disentangled from the material forms of sociotechnical change (with energy systems a key case) that might be promoted or hindered as a result.

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