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Viewpoint

Energy provision and housing development: Re-thinking professional and technological relations

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HIGHLIGHTS

- Current policy externalises professional–technological interactions.
- Professional practises and sustainable technologies are mutually shaped.
- How energy is provided affects future energy consumption.
- Changes to professional practices influence energy provision.

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ABSTRACT

This paper questions policy's approach to the implementation of sustainable technologies as part of the UK environmental policy (Code for Sustainable Homes—'the Code'). Current policy adopts a market-based model promoting rational choice and technological determinism as a solution to the environmental challenges of carbon emissions and energy reduction. We argue that this approach externalises professional actors' situated practices by singling out isolated factors impeding policy's rationale of implementing the Code (e.g. cost). Drawing on our empirical study we identify diverse practices that transpire from professional-technology interactions, demonstrating how sustainable technologies and professional practices are mutually shaped. The important implication of our study is that these 'black-boxed' interactions directly impact on how energy is provided, with consequences for future energy consumption.

1. Introduction

Climate change statistics attribute over a quarter of carbon emissions to residential energy use in the UK. In response, a building standard (Code for Sustainable Homes—the 'Code') was introduced in 2006 to promote carbon and energy reduction by incorporating sustainable technologies into the design and construction of new built-homes. Policy literature addresses the Code's efficacy by singling out potential 'barriers' and 'enablers', such as cost and consumer engagement, which are categorised as one of the following: the social, economic, technological and political (see Glass et al., 2008). The assumption that environmental technologies embody inherent 'potential' is central to this discourse: if these barriers are surpassed, then energy targets will supposedly materialise (Shove, 1998). This technologically deterministic model is persistent, and indeed problematic, in its insistence to view our ability to achieve environmental change as a matter of rational individual choice, casting to one side the influential and constitutive ways that socio-technological and professional practices reconfigure energy provision and potential consumption (Guy and Shove, 1993; Shove, 2010).

This paper reflects on how policy understands the practices of actors working for organisations that engage with environmental policies (e.g. the Code) and influence energy provision through designing, constructing and managing new homes. We contend that the situated practices of those professional actors are bi-passed in favour of identifying perceived factors impeding policy's rationale of implementing the Code, such as escalating costs for building contractors (see McManus et al., 2010; Osmani and O'Reilly, 2009). This linear model of socio-technological change contains and delegates these factors to the business of 'barriers to be overcome'. Instead, however, we emphasise the reciprocal and performative interactions between professional actors and sustainable technologies and their effect on practices of energy provision.

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Aforementioned, alternative approaches to the rational model analyse the working environments or 'contexts of action' (Shove, 1998: 1108) in which housing professionals operate, and which influence 'energy-related' decision-making, housing design and energy provision (Guy, 1998; Guy and Shove, 1993). For instance, Guy and Shove (1993) argue that housing developers employ differing design specifications to their new builds according to the wider economic and housing market conditions that directly impact on energy provision. When a property holds a high investment yield, technologies such as energy intensive air conditioning units become the norm. Contrastingly, when the economic climate is weaker, resident use of energy is prioritised with attention paid to housing maintenance, management and running costs (Guy, 1998). Guy and Shove's (1993) work accounts for the wider socio-economic conditions that shape working environments, influencing the decisions and actions of housing professionals. Yet, there still remains little understanding about the situated and contingent practices of these professionals as they change in relation to environmental policy recommendations, which form a key part of their everyday work experience. Focusing on this, we emphasise the located and reciprocal interactions between professionals and sustainable technologies, which they are charged with incorporating into housing design, construction and management as part of the Code's recommendations. Our empirical study identified the emergence of varied practices performed by housing professionals as they implement sustainable technologies suggested by the Code. We argue that these interactions with the technologies are significant for shaping how professionals manage their relationships and jurisdiction, and conduct their practices. Sustainable technologies act as agents of change with diverse consequences for energy provision. We carried out 20 in-depth interviews with professionals working for a UK housing association between June 2010 and August 2011. Each was a 'front-line' actor working with housing schemes developed under the Code and included: architects, a building contractor, development managers, a community regeneration officer, maintenance managers and council employees. In the interviews we explored how these professionals put into practice the Code through their diverse engagements with incorporating sustainable technologies into new housing developments.

2. 'Externalising' professional and technological relations

In considering the challenges that 'designers, material providers and constructors' face in building environmentally sustainable housing, Glass et al. (2008: 4535) suggest '[there is a] danger of overemphasising the physical characteristics of construction; considering the building in a detached way, separate from its environment and its social setting'. Continuing, they identify the following four categories: political, social, economic and technological, under which 'enablers and barriers' are subsumed. They argue that certain enablers and barriers constrain, as well as facilitate, a building construction's contribution to 'the transition to secure, sustainable, low-energy systems' (ibid: 4534). To us, these two statements are incompatible and symptomatic of a wider tendency in policy literature to externalise the situated practices of professional actors from socio-technological change (see Shove, 2010 for a discussion on domestic 'behaviour change'). On the one hand, policy literature is arguing for an appreciation of the interconnectedness between what we can conveniently term as the 'social/professional' and 'technological'. On the other, these 'elements' are separated from one another in an effort to identify the relevant factors restricting the supposedly environmental efficiency of a new building's technological construction. Indeed, often when sustainable technologies are discussed it is invariably in terms of their embodied potential for environment benefits without reference to the activities of professional actors (e.g. McManus et al., 2010; also see Shove, 1998) or a narrow focus on cost-related issues (e.g. Osmani and O'Reilly, 2009). As Latour (2005: 4) suggests, the notion of 'social context' has long been used 'as a specific type of causality to account for residual aspects that other domains (psychology, law, economics, etc.) cannot completely deal with'. Similarly, Shove (2010: 1275) criticises policy's use of 'contextual factors' as explanatory causal variables for understanding environmental sustainability and technological change, such as that described above.

Crucially, this approach neglects the interrelatedness of the social and technological practices and relations of professional actors in influencing how policy is enacted. Callon's (1998) analysis of market practices provides a means to challenge policy's promotion of a market-based model, which posits a rational choice and technologically deterministic approach as a solution to the reduction of carbon emissions and energy consumption. He suggests that an 'omnipresence of connections with the outside world' shape market practices, which is typified by a lack of closure and stability (Callon, 1998: 250). He characterises the various elements that both constitute and transform these practices, which include human and non-human actors, knowledge and skills, as 'resources and intermediaries' (ibid: 245). In doing so, Callon underlines a crucial and general point: market practices are at once constituted and reproduced through actors' socio-technological activities: they are not purely rational 'a-social' entities (see also Du Gay and Pryke, 2002). With policy's market-based model for environmental change in mind, we argue that bracketing off professional actors and their interactions with technologies from understandings of policy implementation is a 'purification' so far removed from the actualities of the practices through which environmental policy is negotiated. To demonstrate our argument, we next present two examples of the reciprocal and intertwined relationships that can occur between professional actors and the technologies with which they engage with as part of their attempts to comply with environmental policy. We view sustainable technologies, using Callon's (1998) terms, as both 'resources' and 'intermediaries' that have the potential to shape how energy is provided, with consequences for future energy consumption.

3. Re-shaping energy provision: interactions between technologies and professional actors

In our study we identified divergent and contested practices that emerged from the interactions between professional actors' and sustainable technologies as part of putting into practice the Code's recommendation for a reduction in carbon emissions and energy consumption. This recommendation requires the installation of those technologies to try and achieve the UK government's environmental targets of all new housing being 'zero carbon' by 2016 (DCLG, 2006). The Code is made up of nine design categories with one of the most significant being 'energy/carbon dioxide' because it consists of 21.4 per cent of potential points available to housing developers to gain Code accreditation through, for example, incorporating everyday 'eco-labelled' (e.g. washing machine) and 'low and zero carbon' (e.g. photovoltaic cells) technologies into housing design. We looked at key processes that are central to housing development, focusing in particular on the installation and management of sustainable technologies. In doing so we demonstrate how the contingent dynamics of the interactions between professionals and technologies have important implications for practices of energy provision and environmental outcomes.

3.1. Installing sustainable technologies: maintaining the 'status quo'

Sustainable technologies are not neutral entities, as is often portrayed in policy literature. Professional actors are acutely aware of, and creatively mobilise, the possibilities for these technologies to reconfigure their working practices and relationships. One example is the appropriation of the process of installing photovoltaic cells (PV), which generate electricity, onto the roofs of a social housing development in the south-east of England. The installation was carried out in such a way as to maintain a social housing association's existing work practices and their relationships to their tenants, keeping in place the 'status quo'. In doing so, policy's perception of the 'technological potential' embodied in the PV system to generate renewable electricity is challenged, an issue we return to later.

The installation of the PV system requires that the cells are positioned on a building's roof to convert light into electricity with feedback 'smart' meters fitted inside of the property. The meters allow residents to see how much electricity their PV system is generating; theoretically, excess electricity can be sold back to the national grid. For the housing association, the notion of being able to generate renewable energy for the financial benefit of social housing tenants is particularly pertinent. We found that with this development no feedback meters had been installed. A maintenance officer, who worked with residents to manage and maintain the properties, explained that this is because it is the residents' responsibility to engage with their energy supplier. Indeed, if the housing association install the meter this would change their relationships with the residents – acting as their energy supplier rather than just a landlord: '[We] tend not to do it, as we do not deal with the energy suppliers'. Because the residents are social housing tenants it is unlikely that they will possess the financial means to buy a meter themselves: 'They [meters] cost about £400–500 realistically, most of our residents would not have that sort of money'. Indeed, sustainable technologies do not necessarily guarantee the imagined environmental outcomes even when fully installed. Rather, what this case underlines is the strategic appropriation of sustainable technologies by professional actors as resources to manage and maintain existing work practices and relationships between the housing association and its tenants. These practices affect the processes through which energy is provided.

3.2. Changing practices: from landlord to utility provider

Different sustainable technologies affect professionals' practices in diverse ways. In this second example we describe how a technological system, biomass Combined Heat and Power (CHP), drastically reshapes the housing association's practices and the nature of their relationships with their tenants. Biomass CHP creates heat and energy from the incineration of materials, typically wood pellets, using one communal boiler. It is a centralised system that provides, in this case, heat and hot water for a large block of social housing flats located in south-east London. The integrated way in which the CHP system is constructed and energy is generated directly impacts on the housing association's practices. We found that it transforms the housing association's practices and key relationships from acting as a social housing landlord to a utility provider. This is a scenario that the housing association wanted to resist, evident in the first example. In this case, the development of the flats was part of a collaborative effort with a private developer (known as a Section '106' Agreement) where the developer led the construction process and was decisive in determining the choice of technologies to install in order to meet Code requirements for environmental sustainability and its commercial priorities. In these situations, the housing association has less influence on the design and construction process, which includes the choice of materials and technologies used. A development manager for the flats explained that using a 'non-communal' heating system (e.g. each flat having their own gas boiler) would not change the associations' work practices. Here, utility suppliers have a contract directly with the residents and are responsible for supplying energy, and the resident for paying them. The utility supplier is accountable for interruptions to the energy supply. Similarly, residents are liable for unpaid bills to their utility supplier. But, with a centralised system, such as biomass CHP, this dynamic is radically reconfigured: 'where we have a communal system, heating or power system, suddenly there is not a utility supplier, we have a utility supplier and then we supply to residents. So we are effectively becoming a utility supplier.' No longer is there an independent utility provider: the social housing association supplies the residents with energy, which transforms their role into a utility provider, as well as a landlord. This creates new practices, responsibilities, and relationships with tenants: they have to check meters, source energy, bill residents, and manage resident debt, in addition to the usual business of managing tenancies. The example makes clear the potentially far-reaching ways in which sustainable technologies can re-configure professional practices and jurisdiction, affecting the processes and relationships through which energy is provided.

4. Discussion and conclusion

We began this paper by arguing that current policy's neglect of professional actors' engagements with the UK's environmental policy for building new homes is problematic in its isolation of social/professional and technological relationships from each other. Adopting a market-based model that promotes rational choice and technological determinism, policy literature frequently externalises the wider social conditions and dynamics of professional actors' situated practices from the so-called inherent technological potential of sustainable technologies. As Callon's (1998) work underscores, the conceptual foundations underpinning the externalisation of the 'social' and 'technological' from market practices is problematic, as it is precisely the intertwined and reciprocal nature of these elements that constitute and reproduce them. In highlighting the performative character of practice, these interactions between professional actors and the technologies with which they incorporate into their work as part of policy recommendations, take centre stage as constitutive elements of work practices with important significance for energy provision. Acting both as 'intermediaries' and 'resources' (ibid.), sustainable technologies become entwined in processes of housing development, such as technology installation and management.

As we saw with the first example of technology installation, housing professionals strategically appropriated the partial installation of a PV system to manage their relationships with their tenants and to maintain their existing role as a landlord, rather than becoming a utility provider. Contrastingly, in the second example of technology management we witnessed how an alternative technological system – biomass CHP – transformed the housing association's responsibilities, practices, and relationships to its tenants. No longer acting solely as a landlord, the association now had to reluctantly perform the role of a utility provider, which drastically changed their work practices. These two examples of housing professionals' engagements with sustainable technologies illustrate the diverse and conflicting ways in which professional–technology interactions constitute and reconfigure practices, affecting processes of energy provision.

Our study underscores the critical need for policy to consider how professional practices are influenced by an engagement with sustainable technologies. By ignoring this question, policy also neglects the implication that these engagements shape how energy is provided, with consequential impacts on potential energy consumption. Indeed, policy needs to consider how residents continue to

negotiate energy provision in the home, which continues beyond the Code's accreditation. By restricting its focus on isolated factors, such as cost, current policy appraisals of the 'effectiveness' of the Code are blinded to how professional practices and policy recommendations are co-produced, effecting sustainable outcomes. The question of how policy-recommended technologies actively transform and/or help maintain professional practices and relationships with multiple stakeholders is effectively 'black-boxed'.

At a first glance, our findings suggest that the technological 'solutions' that current environmental policy offers to reduce carbon emissions and energy consumption are easily 'hindered' by the complexity of professional practices. For instance, efforts by actors to manage (un)foreseen changes to professional relationships and work practices brought about by an engagement with sustainable technologies, such as the partial installation of the PV system. But, as we argued earlier, the notion that these technologies in-and-of-them selves have the potential to enact environmental change is deeply problematic. A comprehensive reading of our research points to an urgent need to re-think the ways in which policy conceptualises sustainable technologies in relation to professional practices. Rather than considering these technologies in isolation, it is imperative that policy begins to consider how these practices, which sustainable technologies constitute and re-configure, change the shape and form of energy provision.

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