The Energy Cultures framework: exploring the role of norms, practices and material culture in shaping energy behaviour in New Zealand and the Pacific

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Abstract

The energy cultures framework was developed in 2009 to support interdisciplinary investigation into energy behaviour in New Zealand. In this paper, we discuss the framework in light of five years of empirical application and conceptual development. The concept of culture is helpful in seeking to better understand energy behaviour because it conveys how behaviours are embedded within the physical and social contexts of everyday life, and how they are both repetitive and heterogeneous. The framework suggests that the energy culture of a given subject (e.g. an individual, a household, a business, a sector) can be studied by examining the interrelationships between their norms, practices and material culture, and how these, in turn, are shaped by external influences. We discuss the key theoretical influences of the framework, and how the core concepts of the framework have evolved as we have applied them in different research situations. We then illustrate how we have applied the framework to a range of topics and sectors, and how it has been used to support interdisciplinary research, in identifying clusters of energy cultures, in examining energy cultures at different scales and in different sectors, and to inform policy development.

1. Introduction

The Energy Cultures framework (Stephenson et al 2010a) was originally developed to fill the need of our research team for an integrating model to support multidisciplinary inquiry into energy behaviour – a need repeatedly expressed by the research community (Keirstead 2006; Wilson & Dowlatabadi 2007; Dietz et al. 2013). With a team that included researchers from the physical sciences, economics, law, psychology and sociology, it was necessary to develop a heuristic, or mental shortcut, whereby team members could communicate using a shared language, could readily grasp the complexity of behavioural drivers, could see where their discipline could contribute to a

context-rich understanding of behaviour, and could assist in integrating findings. The resulting framework took cues from multiple theories and explanations of behaviour, and aimed to bridge the divide between research traditions centred on the individual and those focused on wider social and technological influences.

In this paper we discuss the framework in light of five years of empirical application and conceptual development by the Energy Cultures research team. The concept of energy culture is consistent with the relatively recent shift to theorising energy behaviour in relation to its wider social and material context (Hargreaves et al 2013; Hards 2013; Powells et al 2014). In its applications we have begun to appreciate that a cultural lens, as suggested by Sovacool (2014), is indeed useful in examining questions such how conventions about energy use become cemented or change over time, the role of normalisation in consumption patterns, and opportunities for changing seemingly habitual behaviour.

Since 2009, the Energy Cultures research team has applied the framework in a variety of contexts and scales. Our initial three-year research programme, involving an interdisciplinary research team of five members (Energy Cultures 1), examined household energy behaviours relating to space heating and hot water heating. This was succeeded by a 4-year programme (Energy Cultures 2) that studies opportunities for more efficient energy behaviours in businesses and households, and also how to stimulate adoption of more energy-efficient transport. Energy Cultures 2 involves a 15-member multidisciplinary team which includes the original five team members[1]. Other smaller research projects that use the energy cultures framework have also been undertaken by team members, including studies of timber companies' use of drying technologies, the usefulness of different methods of providing home energy advice, household adoption of photovoltaic systems, and uptake of solar lamps in Vanuatu.

2. Key theoretical influences

In developing an integrative framework, the challenge was to achieve a structure and key concepts that were consistent with established theories, readily understandable across a multidisciplinary research team, and general enough to be applicable to diverse circumstances. We were attracted by the concept of culture as a basis for thinking about energy behaviour as it is familiar to most people, regardless of their disciplinary background, and because it helps situate behaviour within a wider context of influences. In everyday conversations, the term 'a change in culture' is often used to refer to the observed need for a fundamental shift in how people think and behave in relation to energy.

As a distinctive set of shared beliefs, values, behaviours, and artefacts (Bates 1990), the concept of culture is also usefully multi-scalar: one can refer to the culture of a family or of a business, and equally to the culture of an industry sector or a nation. There are also subcultures within any wider culture, with characteristics that distinguish them from the overarching culture. The concept of culture is also relational, inviting consideration of how a culture 'both creates and is reinforced by its material objects' (Stephenson et al. 2010a, p6123). The framework, which will be descried more

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[1] Disciplines include consumer psychology, economics, engineering, human geography, law, management, marketing, physics, psychology, sociology, statistics and system dynamics.

fully in the following section, represents the 'energy culture' of any given subject (e.g. an individual, household, firm, business sector) as the interactions between that subject's norms, practices and material culture.   A subject's energy culture may be partially self-determined, but is likely also to be shaped by external influences that are beyond their direct control (Figure 1). Energy culture proved to be an idea that was quickly grasped by members of our multidisciplinary team and provided an access point to more nuanced understandings of behaviour and behaviour change.

In addition to the concept of culture, the framework was particularly influenced by system thinking, structuration, and practice theory. Systems approaches have been successfully applied to help understand complex interactions in physical, biological and social systems, as well as systems that include all of these characteristics (von Bertalanffy 1968; Emery 1969, Midgley 2003). The energy cultures framework was influenced by the notion that the properties of any part of a system depend on its role and interrelationships within the system. Systems are also nested, each with different levels of complexity, and with emergent behaviours that are not evident at other levels. Systems researchers highlight the importance of applying multiple methods to understand complex systems (Mingers & Brocklesby 1997) and the value of systems approaches in identifying points of intervention to achieve change (Flood & Jackson 1991).

These ideas are reflected in design and application of the energy cultures framework, so that in relation to any given energy culture, we are interested in the interrelationships between norms, practices and material culture, and their mutual causality (Dent 2003) in either reinforcing the status quo or in shaping a changed energy culture. In addition, the framework invites consideration of the relationships between external influences and any of the elements of an energy culture that may have a role in constituting, reinforcing or destabilising that culture.

Another key influence in the development of the framework, itself influenced by the systems approach, is structuration theory (Giddens 1984). Developed as a theory of how social systems maintain and reproduce, Giddens differentiates between the ability of people to act as relatively free agents, and on the constraining influences of social, financial and political structures, while acknowledging that both are simultaneously and continuously in interplay with each other. Deriving from the same sociological tradition, practice theory takes an interest in how everyday activities are influenced by the broader structures of society. Practice theory emphasises the role of infrastructure and objects as "necessary components of many practices" (Reckwitz 2002 p.252), and has been widely applied to questions of sustainable consumption, including behaviour giving rise to household energy use (Batriaux et al 2014; Hand et al 2007; Shove 2004, Shove 2014).

The foremost aim in developing the framework was to enable different disciplines to work together using a common language and an integrating model. In this sense, it offers a relatively simple set of concepts that are consistent with the above contextualised approaches to understanding behaviour.
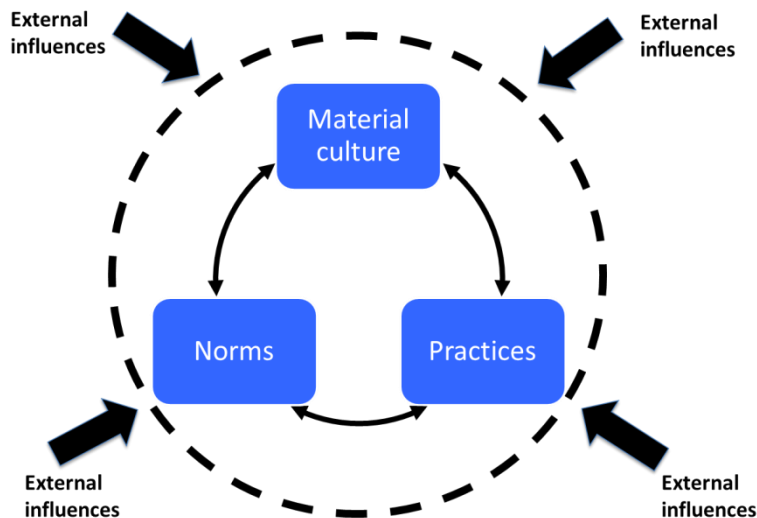
Figure 1: The Energy Cultures framework

3. Energy culture

Energy culture itself was not defined in our 2010 paper, although we did offer the (non-definitive) statement that the energy cultures framework "characterises energy consumption behaviour as the interactions between cognitive norms, material culture and energy practices" (Stephenson et al 2010a, p. 6125). Having repeatedly applied the framework in a research context, it has evolved to become more generic, so that one key difference is that we now refer to energy behaviour, rather than 'energy consumption behaviour', reflecting a broad interest in the behaviour of actors in all parts of energy systems. We would now say that energy behaviour is strongly influenced by the interactions between norms, practices and material culture, as well as by the external influences that form the context in which these interactions are situated.

As introduced above, the concept of energy culture can be considered at many scales and in many domains – from that of individuals or households, to the energy culture of a business sector or a nation. At each of these scales, we suggest that the relevant actors will have a distinctive system of knowledge and belief, with definable material culture, practices and norms, which is where the transactions that form their energy culture are founded. Energy culture is also shaped by the broad spectrum of influences which lie outside of the actors' direct control. The 'boundary' (in systems terms) of a given culture is determined by the norms, practices and material culture over which the actor has agency, and is represented by the dotted line in Figure 1. The concept of energy cultures thus offers a relational and context-specific perspective on energy behaviour.

As we have applied the Energy Cultures framework, we have continued to review its specifications, and consequently have made some refinements that we believe assist in the clarity of meaning, and in the applicability of the framework to a wider range of situations.

3.1 Norms

Norms are shared beliefs in how people should behave in a given context. The energy cultures framework originally referred to 'cognitive norms', but some users felt that this implied a particular stream of work in psychology which was not our intention, nor indeed how the term is often used in other fields (e.g. Cohen 1979; Jost et al 1998). In particular the original term may deemphasise the social characteristics of norms and for this reason our more recent applications of the framework simply refer to 'norms' (e.g. Bell et al., 2013; Hopkins & Stephenson 2014).

In applying the framework, we have found it helpful to differentiate between norms that are reflected in a subject's current practices and material culture, and those that are considered desirable by the subject but have not been realised. We use 'expectations' to refer to the first, and 'aspirations' to refer to the second situation. Aspirations are particularly interesting as they may indicate a level of dissatisfaction with current practices or material culture, and may act as the springboard for change if the right set of circumstances exists, as we have found in our research on the uptake of photovoltaic panels in New Zealand (King, Stephenson & Ford 2014) and the adoption of solar lighting in Vanuatu (Swete-Kelly, Doering, Ford, Gabriel & Walton 2014).

For the purposes of the framework, then, norms are people's expectations and aspirations about their practices and material culture. To illustrate, insights into household norms might be gained from examining their entrenched everyday practices (e.g. do they normally put on warmer clothes when they are cold, or do they turn up the thermostat?), the level of service they expect from the use of energy (e.g. how warm do they expect their house to be? what level of warmth do they aspire to?), and the degree of importance that they would place on having energy-efficient technologies (are some already owned? are others considered desirable?). When investigating energy cultures at other scales and in other sectors, norms will have different characteristics, such as the norms of an industry sector as to acceptable practices and technologies (Bell et al 2013).

3.2 Material Culture

Material culture is a term adopted from anthropology, where it refers to the physical evidence of culture including objects, buildings and infrastructure (Woodward 2007). The term is both a reminder of the influential role of cultural expectations in choosing physical objects, and how these in turn shape culture. From an anthropological perspective, material culture has both functional and symbolic qualities, and people's choices to acquire, maintain or discard artefacts is in part driven by their implicit meanings (Bates 1990). The complex interplay between artefacts and agents is also of core interest to the linked theories of socio-technical systems and the multi-level perspective (Geels 2002, 2004). From a practice theory perspective, practice is "an emergent outcome of the actions and inactions of all (including materials and infrastructures, not only humans) involved" (Shove & Walker 2010, p475). This is not to suggest that these theories are necessarily commensurate, but rather that they all reinforce the role of material culture in shaping (and being shaped by) behaviour.

For the purposes of the energy cultures framework, material culture comprises the technologies, structures and other assets that play a role in how energy is used. Some of these forms of material culture may use energy for their operations (e.g. appliances), others may influence the quantum of

energy used (e.g. building materials and insulation), others may provide energy information to consumers (e.g. feedback devices), and yet others may generate usable energy (e.g. photovoltaic panels). In other sectors and scales of consideration, relevant material culture could include factories and their machines, road and rail infrastructure, and energy production developments such as power stations and oil wells.

3.3   Practices

The original depiction of the Energy Cultures framework referred to 'energy practices' as the third core element of energy culture. We have changed this term to simply 'practices' to give a consistency across all of the three elements (i.e. the framework does not refer to 'energy norms' nor 'energy material culture'), and also to recognise that most practices that use energy are not for the primary purpose of using energy. At a household level, for example, energy is almost invisibly embedded in most household practices that are carried out to fulfil needs and desires for goods and services.

The term 'practices' was chosen for its everyday meaning of 'usual or customary action' (Hanks 1979, p 1150). While acknowledging the theoretical pedigree of the term 'practice' (Giddens 1979, Shove 2004, 2014), our adoption of 'practices' for the framework was as an accessible concept for practitioners from non-social disciplines which, like 'norms', could also act as a gateway for the application of established disciplinary theories.

The framework however differs from practice theory in that 'practices' is used to refer to both routinized activities and to actions that may occur relatively infrequently in the life of a subject, yet which are a common occurrence across their social peers. Practices thus span from everyday habitual activities to the less frequent process of choosing and acquiring material objects. We suggest that the latter are equally cultural practices, because through such acquisitions, people enact and reproduce a way of life that is consistent with their systems of belief. Another difference is that the framework differentiates between practices and material culture, while recognising that these are strongly interrelated. In socio-technical systems theory it is similarly recognised that "social practices and technological artefacts shape and are shaped by one another'' (Smith and Stirling 2007, p 351). Practice theory, in contrast, subsumes such artefacts within the concept of practice.

3.4 External influences

External influences make up the set of circumstances that form the contextual soup within which a given energy culture emerges and is sustained. Systems approaches make a useful distinction between transactional and contextual environments, in that subjects directly interact with and influence their transactional environment, whereas they must respond and adapt to their contextual environment; this distinction being one of control (Ackoff 1974). In distinguishing between structure and agency, as discussed above, Giddens (1984) offers a theoretically distinct but related perspective. We apply these ideas to help distinguish between a given energy culture and its external influences. The boundary between a given energy culture and its external influences is determined by agency, or the scope of the actor's ability to take relatively independent action.

External influences may lock in patterns of behaviour, create resistance to change, or drive the adoption of new behaviours. In any given circumstance, the nature of external influences will depend on whose energy culture is under inquiry.   We can contrast, for example, the external influences on the energy cultures of home owners with those of people who rent. A home owner has agency over the physical structure of the house, the type of heating, and whether to insulate or install double glazing. In contrast, a renter (in New Zealand at least) has a far narrower realm of control, often limited to mobile heating devices, while the material elements of the house and fixed heating devices instead form part of the external influences on their energy culture.   External influences shared by both groups are likely to include regulations, subsidies, energy prices, policies, marketing, information campaigns, the quality of tradespeople, and wider social norms.

The boundary between external influences and the relevant energy culture is not entirely impermeable: subjects can influence their contextual environment because they also are part of its constitution. As an example, the recent rapid uptake of grid-connected photovoltaic systems by New Zealand households (a change in energy culture), if it continues, could increase the variability of electricity supply to a level that may require changes in the operation of the electricity grid (Miller et al 2014).

Our original diagrams depicting external influences (Figures 3 and 5 in the 2010 paper) show these influences separated into whether they specifically impact on norms, or practices, or material culture. While this is clearly the case with some external influences (e.g. minimum performance standards for washing machines will impact on the quality of new appliances available for purchase, a direct influence on material culture), we now understand that some influences will have a more diffuse impact, potentially influencing more than one of the three elements simultaneously. For example, an information campaign on switching off lights in unused rooms may impact on both norms and practices.

External influences, then, are factors that are largely beyond the control of the subject in question, and yet have the potential to shape their norms, practices or material culture. The nature of these influences, and the classification of what is 'external', will differ according to the actor or group of actors whose energy culture is under inquiry.

4. Using the framework

As a pan-disciplinary concept, the energy cultures framework has been effective in promoting interdisciplinary collaboration in the Energy Cultures research programmes. In our paper *The Practice of Interdisciplinarity* (Stephenson et al 2010b), we explained that "while we had only intended it to represent the 'field' we were working within, it was potentially far more powerful, in that it provided a framework around which we could each see where our particular expertise (knowledge and practices) could contribute to understanding the whole" (p 275). The framework offers a common language for the interdisciplinary team; a systemic representation of key characteristics that can be individually or collectively examined through different research methods; and a model through which these multiple findings can then be considered in an integrated way.

The framework has also been used as the basis for research design. For example, in the first
extended energy cultures research programme a national household survey gathered data about
material culture and practices; in-depth interviews gathered data about norms in relation to
practices; choice modelling helped understand the link between norms and material culture through
through variations in householders' willingness to make trade-offs among the attributes of space
and water heating systems; and reviews of law and policy explored the external context of
household energy cultures (Barton et al 2013). We have continued to utilise the framework to guide
multi-party research design in subsequent research programmes, acting as a reminder that research
should collect data that will inform examination of all of the components of the framework, as well
as their interrelationships. For example, in a recent piece of work designed to assess the factors
surrounding energy related behaviour changes following the introduction of solar lanterns in rural
Vanuatu, the framework provided a useful lens to guide the design of research questions and the
subsequent tools for enquiry (Swete-Kelly et al., 2014).

The framework has also been fruitful the basis for structured analysis of data even where the
original research was not designed with the framework in mind. In 2013 we carried out interviews
with international transport experts on the forces that are shaping transport systems of the future,
as the first stage of a multi-round Delphi study (Stephenson et al. 2014). In need of a sense-making
tool for the complex picture that emerged, we used the energy cultures framework to structure our
analysis. As our focus was transport rather than energy, we used the term 'transport culture' to
refer to distinctive patterns of interactions between material culture, norms and practice, with our
scale of inquiry for that study being at the global level. Figure 2 shows the key drivers of change to
the dominant car-centric transport culture, and Figure 3 shows characteristics of the new transport
culture that is emerging from these change drivers.
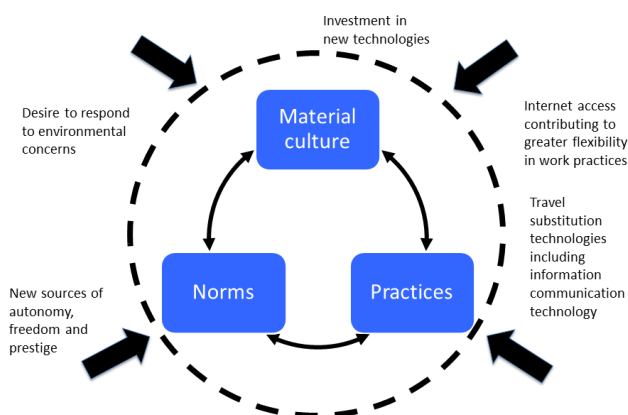
**Figure 2: Drivers of changes to the dominant transport culture (adopted from Figure 4 in
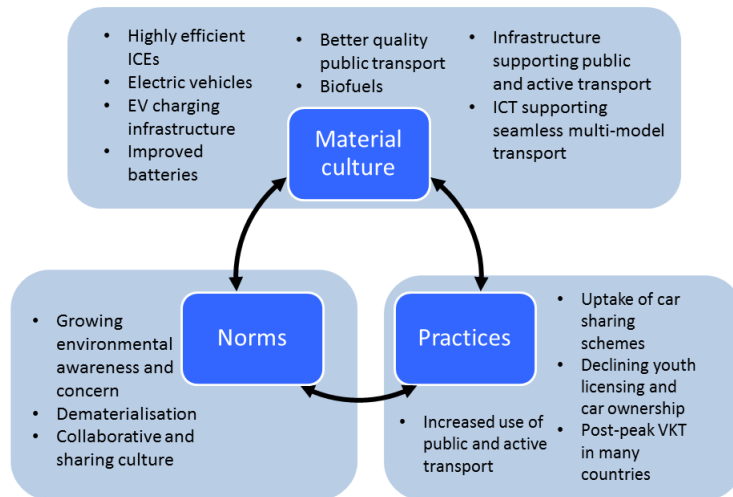Stephenson et al., in press)**

Figure 3: **Characteristics of the emerging transport culture (adopted from Figure 5 in Stephenson et al. 2014)**

In this way the framework helps clarify how energy cultures might be stimulated to change. Looking initially at the external context of an energy culture, one source of change could be through the influence of seemingly unrelated trends in the external environment, such as developments in information technology affecting youth mobility (Hopkins & Stephenson 2014). Another driver of change could be through the intentional shaping of the external environment through law or policy to encourage or discourage particular norms, practices or technologies (Barton et al 2013). Change could also result from the actions of the market, introducing new products, creating new aspirations, or shaping practices through pricing (Swete-Kelly et al 2014).

4.2 Clusters of energy cultures

In the 2010 paper we proposed that it would be possible to differentiate distinctive clusters of energy cultures – i.e., groups within a population that had similar patterns of norms, practices and/or material culture. Using data from a comprehensive energy survey of 2400 New Zealand households, we carried out a two-step cluster analysis based on differences in total household energy use. This statistical process produced four main clusters within the population, which, to our surprise, bore some relationship to the energy cultures framework in that the emergent point of difference was the relatively efficiency of material culture and practices. The Energy Economical cluster, for example, tended to have an inefficient material culture but efficient energy practices; in contrast the Energy Easy cluster had relatively energy efficient material culture but not particularly efficient practices. Another cluster, Energy Efficient, scored well on both counts, and Energy Extravagant were inefficient on both counts (Lawson & Williams 2012).

These findings formed part of policy advice generated by the energy cultures team which included targeting interventions according to the four different energy culture clusters. These included programs to improve material culture (e.g. additional Minimum Energy Performance standards; continuing insulation subsidies); programs to improve the efficiency of energy practices (e.g.

individualised home energy advice from trusted advisers); and a focus on shifting norms (e.g.
continuation of a successful television campaign, and paying greater attention to the powerful role
of social networks) (Barton et al. 2013). We have found that the ability to identify distinctive
clusters based on the core elements of the energy cultures framework offers insights into why
energy behaviours can be so heterogeneous even where households are demographically similar.

We have similarly identified different clusters of energy cultures within the timber industry relating
to the possession and use of different timber drying technologies (Bell et al 2013) and have
discussed the changing mobility pattern of Generation Y as the evolution of a distinctive 'youth'
transport culture (Hopkins & Stephenson 2014).

4.3 Applying the framework to different scales and sectors

In our original paper we suggested that any integrating model relating to energy behaviour should
be applicable to multiple sectors and at multiple scales (Stephenson et al 2010a). To date, our
applications of the framework in published literature include household energy behaviour (Mirosa et
al 2011; Lawson & Williams 2012), uptake of solar power at a community level (King et al., 2014,
Swete-Kelly et al. 2014), businesses energy behaviour (Bell et al. 2013), changing youth mobility
(Hopkins & Stephenson, 2014), and transport transitions at global and national levels (Stephenson et
al., 2014, Ford et al. 2014). In short, we have found it to be applicable at scales from the individual
to global, and to households, businesses, communities and population sectors.

Within this work we have also identified nested energy cultures, such that some of the external
influences for one energy culture can be seen to be part of another energy culture at a higher scale.
A study of drying technologies used in the timber industry, for example, concluded that the energy
cultures of individual firms were shaped by the dominant energy culture of the industry as a whole,
through its shared expectations of what comprised a 'normal' technology, its active support and
advice relating to that technology, and supportive infrastructure (Bell et al. 2013). The industry-wide
energy culture formed a set of external influences that shaped the perceived choices of individual
firms and made it hard for them to adopt more energy-efficient drying systems (Figure 4).
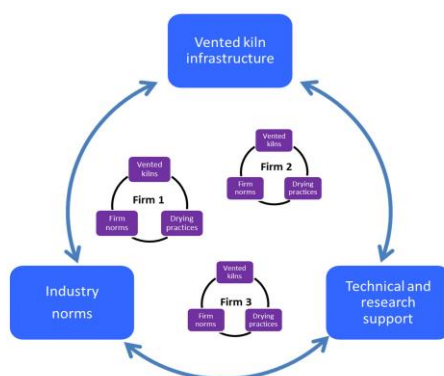
Figure 4: Multi-scale energy cultures in the New Zealand timber industry (adopted from Figure 4 in Bell et al. 2014).

Ongoing research within the Energy Cultures programme is examining the characteristics of energy cultures in other sectors and at other scales such as within small-medium businesses, within households' transport behaviours, when households move home, and amongst policy-makers.

4.4   Further applications

As the concepts that underpin the Energy Cultures Framework have been tested and enriched, we have found that the framework acts both as a model of behaviour and as a theory of behaviour change. Darnton (2008) distinguishes the two as follows: "Models of behaviour help us to understand specific behaviours, by identifying the underlying factors, which influence them. By contrast, theories of change show how behaviours change over time, and can be changed […]. While the two bodies of theory have distinct purposes, they are highly complementary; understanding both is essential in order to develop effective interventions." (p. 2).

As a model of behaviour, the framework offers an interrelated set of concepts centred on a subject and the interrelationships between their norms, practices and material culture, as well as the role of the social and institutional setting. Rather than attempting to comprehensively list all influences on behavioural outcomes, it invites more detailed behavioural theories to be applied to investigate various junctures of the framework.

As a theory of change, the framework shows potential in structuring investigation into the variety of ways in which changes in energy cultures, and thereby energy behaviour, might be initiated: through dispersed changes in the external environment, such those shaping youth mobility; through specific changes in the external environment, such as subsidies or new technologies; or initiated by subjects themselves through their own aspirations to change, or as a knock-on effect of new material culture (e.g. moving house) or new practices (e.g. resulting from the arrival of a new baby).

Internationally, its applications by researchers studying energy behaviours include a study of motivations, barriers and enablers relating to energy saving (Sweeney et al 2013), a study of student energy consumption (Ishak et al 2012), and to support a multi-criteria analysis of consumer behaviour in relation to energy companies' tariff plans and products (Šliogerienė et al 2012). Other international applications have included its use to frame individuals' actions to reduce greenhouse gas emissions (Young & Middlemiss 2012), a study of pro-environmental behaviour (Hoicka, 2012), behaviour in the transport sector (Demir 2012), and opportunities for regulation of an electricity grid (Colmenar-Santos et al., 2013). As show by these examples, and by its recent use by our research team to help understand mobility behaviours (Hopkins & Stephenson 2014, Ford et al 2014, Stephenson et al 2014), we are finding that the framework is fruitful in relation to a much broader range of behavioural topics than simply energy behaviour. As new applications of the framework have emerged, we have begun to consider whether there are behavioural situations in which it might not apply. An example might be where the behaviour of interest is not significantly shaped by material objects, such as the behaviour of policy-makers, where norms and practices predominate. Even here, though, the framework has been adapted (Croad 2014) to explore 'governance cultures'

in energy policy development, proposing that the immaterial infrastructures of institutions and law could be said to be the equivalent of material culture, in that these materially shape the scope of action and norms.

Finally, returning to the original purpose of the framework as a simple heuristic, we have found it immensely helpful as the basis for presentations to policy makers and industry organisations. It offers a straightforward way for non-specialists to grasp the complex and interconnected drivers of behaviour, and to support a structured consideration of potential ways to achieve behaviour change through influencing norms, practice or material culture.

Conclusion

The energy cultures framework has undergone a number of developments in its focus, core concepts and applications since 2010 (Table 1). At its most fundamental, the framework offers a simple and effective heuristic that represents key forces that shape energy (and other) behaviour. It provides a 'language' to support interdisciplinary communication, it has informed the design of interdisciplinary research programmes, and has been successful in integrating findings and developing policy advice. The core concepts of the framework – that the interactions of norms, practices and material culture generate distinctive energy cultures; and that these are shaped by external influences beyond the control of actors – have been tested and refined through research. Further application and testing is desirable to explore its usefulness as an explanatory model in its own right.

At a deeper level of application the framework brings together insights from disciplines that focus on individual determinants of behaviour along with those that take an interest in broader contextual influences. For a team of researchers who approach behaviour from different theoretical perspective, it offers a gateway to the application of discipline-based theories to enrich our investigations, while retaining an overarching integrating framework which can form the basis for sharing insights and integrating findings.

Table 1: Developments of the energy cultures framework since 2010

	2010	Developments to 2015
Focus:	Energy consumption behaviour	Energy (and other) behaviour
Core concepts:	Cognitive norms, energy practices, material culture, external influences	Norms (expectations and aspirations), practices, material culture, external influences
Applications:	Support interdisciplinary research; research design; highlighting drivers of behaviour change	Support interdisciplinary research; research design; highlighting drivers of behaviour change; segmentation of energy cultures; framework for data analysis; identification of multi-level energy cultures; use alongside other behavioural theories; identification of potential interventions; communication tool with industry and policy sectors

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