DEPARTMENT OF ENERGY & CLIMATE CHANGE

An introduction to Thinking about 'Energy Behaviour': a Multi Model Approach

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An Introduction to Thinking About 'Energy Behaviour': a multi-model approach

A paper for the Department of Energy and Climate Change

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Thinking about 'Energy Behaviour'

Behaviour: the action, reaction, or functioning of an organism or system, under normal or specified circumstances

Introduction

Human beings are not simple to understand. Even if they were, most of us now live in a complex world that has allowed us to become detached from the natural patterns and drivers that have shaped humans and human consciousness over millennia of evolution. To try and understand how and why people behave the way they do in modern society requires us not just to understand the human side of the equation, but also to understand a great deal about the social context in which this behaviour occurs. The purpose of this paper is to set out a number of different perspectives that can be used to understand and interpret behaviour. It sets these out within a framework that demonstrates how each approach can contribute something valuable towards developing a broad view of behaviour. Within this paper the term 'behaviour' is used to refer simply to 'what people do' in the broadest terms. **WARNING! The intention behind this paper is to act as a simple introduction to a range of theories that come from very distinct academic backgrounds, and to present them in a way that encourage policies to be developed that take them all into account. As a consequence, some of the more nuanced aspects of the theories are inevitably simplified. Therefore the reader is strongly encouraged to read the additional recommended literature to get a fuller understanding of each perspective.**

Over recent years, it has become increasingly important for government to develop its understanding of 'behaviours' in order to be able to develop and implement more effective policies. Attempts to influence behaviour in the past have traditionally tended to rely on either legislative prohibition, or on financial incentives or disincentives to steer people into desired paths of activity. Whilst both these strategies remain important tools within any policy toolbox, a much broader understanding of behaviour allows:

a) The development of "Light touch" policies that do not need to rely on legislation and regulations,

b) Policies that are more effective in areas where prohibitive or fiscal measures have not worked as well as expected,

c) Better use of fiscal and regulatory instruments so that where they are necessary, they are used in the most effective way and are seen to be legitimate.

Particularly since the 1960s there have been significant developments in how behaviour is understood that have come from a range of different disciplines and using a range of different methods reaching between psychological experiments on isolated individuals, through to extensive sociological studies of the contexts in which people act. When considering human behaviours, it is important to remember that people do not follow simple physical laws and so we cannot model them in the way we do physical processes. In fact, we need to remember that even when we model physical processes, our models are always simplifications of reality,

and that they are either only as good as we can make them, or as good as they need to be. In the words of statistician George E.P. Box, **"All models are wrong, but some are useful[1]"**.

This means that there is no "right" way to understand and intervene in behaviours, but there may be ways of approaching the task that are more effective or efficient depending on the issue and context. Whilst there is some evidence that suggests that people may have certain (effectively) innate behavioural tendencies, not all people are exactly alike and there is also clear evidence that any given individual does not necessarily follow these tendencies uniformly across all the different behaviours they engage in. Understanding the context of behaviour may be as or even more important in some cases than understanding people's motives and actions.

This document seeks to provide a broad overview of a number of different ways in which we can look at, and seek to understand, behaviour within the area of Domestic Energy Use. The first section of the paper discusses four very distinct theoretical approaches to understanding energy behaviour. The purpose of this is to make it clear how different academic disciplines can view the same issues each through their own completely separate 'lens'.

The next section of the paper then lays out a framework (Triandis' Theory of Interpersonal Behaviour) which can be used for understanding how real world behaviour can be broken down into different elements and stages, each of which can be interpreted using a different mix of the 'pure' theories.

Using this framework the paper outlines three key areas of contemporary work in this area orientated around 'Behavioural economics', 'Values and Identity', and 'Social Practices' and demonstrates how each can be related to the various parts of Triandis' behaviour model.

Different Theories of 'Energy Behaviour'

Theory: An explanation of reality – derived from the Greek *the• ría* - viewing, contemplating

Unlike the natural sciences, most social sciences do not seek to find a single theory that will explain things – people and circumstances are too varied and complex for this to be possible. Also, social theories are, by and large, not intended to be predictive in the way that theories in the natural sciences are.

A report by the Centre for Sustainable Energy for Ofgem's Energy Demand Research Project[2] sets out 4 different types of theories that can be used to interpret how people use energy. These are briefly summarised below – **more detailed descriptions are provided in Annex 2**:

[1] George E.P. Box, "Robustness in the strategy of scientific model building", page 202 of Robustness in Statistics, R.L. Launer and G.N. Wilkinson, Editors. 1979.
[2] CSE 6th Progress Report on EDRP

Economic Theories:
Energy is a commodity and consumers will adapt usage in response to price signals

Whilst there is some evidence of short-term responses to increases in energy price, this is significantly constrained by conditions such as cold weather which tends to increase energy usage whatever the cost. In the long-term, there is even less evidence that people respond well to purely economic signals.

Psychological Theories:
Energy use can be affected by stimulus-response mechanisms and by engaging attention

This view suggests that people will respond to information regarding their energy usage, such as Home Energy Displays, or billing information that provide them with salient information in a manner that allows, and encourages, them to reduce their usage.

Sociological Theories:
Energy use is largely invisible, energy systems are complex, and daily practices are significant

This approach is orientated around the view that people do not directly use energy, instead we carry out a range of activities or 'practices' that lead to the consumption of energy: we make ourselves warm, we cook, or do our laundry etc. This emphasises how discrete different activities and behaviours are, and how each activity will require very particular targeting in order to achieve changes in behaviour.

Educational Theories:
Energy use is a skill that is learned through experience in specific situations

This view highlights the differences between energy users, emphasising that they are not a homogenous set of individuals, but that they all have complex world-views that reflect very different levels of skills, understanding and motives when it comes to their use of energy. These differences arise through how they learn about energy use and can lead to some very significant differences in use patterns, for example people who are accustomed to pre-payment meters rather than direct debits.

Comparing the Theories

Set out in this way, these four types of theories highlight how energy behaviour can be seen through very different lenses. In reality, energy use is simply what it is, and these are just different ways of looking at it that focus on different aspects of behaviour. None of them provide a complete picture in and of themselves, which would be impossible, however each of them give us a way of looking at the issue in a relatively manageable way. In practice, these approaches are rarely found in such pure states, and in particular some approaches such as behavioural economics clearly bridge groups such as the economic and psychological theories.

Whilst these theories all take quite distinct approaches to looking at energy behaviour, they can be split into two quite different groups, based on how they position the individual. The first two, economic theory and psychological theory, see the energy user as an individual – someone who makes sets of choices in a rational/semi-rational manner, and in a similar way to other individuals. Behaviour is seen as the result of a deliberation or decision on the part of the individual. They make their decisions on the basis of information and prompts available to them at that time. The prompts can be explicit, such as pricing structures or the provision of

clear explanatory literature or other information, or they can be far more subtle or even subliminal, such as the impact of the smell of fresh bread or coffee on potential homebuyers when viewing houses.

A quick word about rationality

Definitions of what constitutes 'rationality' are hotly contested. For the purposes of this paper it may be sufficient to consider that a common (utility based) view of rationality might characterise it as meaning:

1 We are interested in outcomes of behaviour - i.e. instrumental.

2 We know what we want those outcomes to be - i.e. we have known and fixed preferences.

3 Given those preferences for outcomes, and the alternatives available to us, we choose the alternative that best fulfils our preferences - i.e. optimising

Under these terms, the ability of rational decision making to actually result in our desired outcome is far from certain, being extremely dependent on the quality of our understanding with respect to initial conditions and the effectiveness of different strategies for achieving our goals.

The second two types of theories (sociological and educational) take the focus away from individuals and the moments that decisions appear to be made. Instead they put much more emphasis on the context and structures that determine, interact with and are created by the ways that people behave and do the things they do. With regard to energy behaviour, there is a wide array of actors and objects that are involved in the processes determining how energy is used. These extend well beyond the individual, and include: families, households, energy supply companies, other companies involved in making, selling, promoting and installing energy efficiency products, other companies involved in 'home improvements' and building work, 'communities', NGOs and the government, as well as physical infrastructures and hardware. Each of these interacts with each other and can influence energy behaviour in different ways. As well as moving away from focussing on the individual, these theories move away from the apparent moment of decision and look at how social, institutional, material, and infrastructural contexts and individuals' past histories might set the conditions for certain decisions to be more or less inevitable by the time they come to be made.

There may be a temptation to see one or other of these theories as THE way to interpret and understand behaviour. However, like the apocryphal tale of the blind men and the elephant[3](where six blind men each variously describe an elephant on the basis of each feeling only its side, tusk, trunk, knee, ear or tail and come to very different conclusions regarding the nature of the beast), the different viewpoints *can* be seen as complementary and as simply different ways of looking at the same thing . As mentioned earlier, this is one of the areas where this paper simplifies some of the academic tensions between the different theories. Although there may be conflicts at a theoretical level, in practice, taking a range of theories into account when designing policies is likely to help reduce conflicts between the approaches and ensure that much broader strategies can be developed, for example learning from psychological approaches that it is not *just* about getting the pricing right, but also from sociological approaches that neither is *just* about getting sub-conscious triggers correct.

[3] John Godfrey Saxe http://www.constitution.org/col/blind_men.htm

If we take insulation as an example – there is an *economic* consideration that relative costs of energy and installing insulation need to be such that taking action is affordable. There are *psychological* issues relating to how people are made aware of insulation opportunities so that they see it as being relevant to them (these extend well beyond the message "you can save money"). There are *social/institutional/organisational* factors to do with how the all the different parties (homeowners, suppliers, installers etc.) relate to each other , as well as concepts regarding home improvements, adding value to property and more generally how people relate to having work done on their house. Finally there are *educational* concerns, such as the extent to which people might understand whether they should be considering cavity or solid-wall insulation, or even why insulation might be desirable.

Using these Theories

As highlighted above, these theories represent very pure perspectives on how people behave. This is all well and good in certain academic contexts where behaviour is being studied without necessarily seeking to influence it. However, within a policy context it is helpful to incorporate these into a 'model' of how people's behaviour is formed. Whilst this section has aimed to make it clear that there are very different ways in which behaviour can be analysed, the following section describes a structured way of viewing decision making/behaviour determination through which elements of these different theories can be compare, and potentially integrated within policy development. It is important to acknowledge however that in tackling problems using this multi-model approach, one of the outcomes may not be just new potential solutions, but also new definitions of the original problem.

Behaviour Models

Model: A verbal, mathematical, or visual representation of a scientific structure or process

Whilst theories attempt to provide a general, abstracted, explanation of what happens in reality, a model can often be seen as an attempt to create a simplified representation of the actual processes that occur. By using a model we can break down a complex process into separate parts. This can then help us better understand the process, and help allow us to approach the problem in a number of different ways rather than believing that there may only be a single, all-encompassing and 'correct' way of viewing the problem.

The following sections will describe two very different models of behaviour. The first is an individualist model of behaviour based on what is known as "Triandis' Theory of Interpersonal Behaviour". This model looks at behaviour as a process of rational or quasi-rational decision making and enactment, focussing on the particular *actor*. The second model is a socially-orientated model which looks at a range of 'elements' in society that contribute to the enactment of the *action* (or 'practice').

These two models are specifically set out in a way that is intended to emphasise their complementary nature – that they are simply two sides of the same coin or more specifically that they are two ways of looking at the same behaviour; one putting the individual in the centre, the other the 'practice' or activity. As will become clear, the extent to which one model may be more or less useful than the other can relate to the extent to which we see routines or habits playing a role in determining a specific behaviour as opposed to it being the result of a

single specific rational decision every time it is done. In encouraging changes in behaviour, it is always important to bear both perspectives in mind.

Individualist Model of Behaviour

This section sets out an individualist representation of behaviour. There are many different models that can be used from this social psychological perspective. This paper is based around "Triandis' Theory of Interpersonal Behaviour"[4], a model that has been identified by a range of research as being well suited to use with regard to energy behaviour. After describing the basic structure of this model, this section then introduces two bodies of work concerning 'Behavioural Economics (or MINDSPACE)' and 'Values and Identity' which are currently being adopted to explain behaviour change and which relate to different elements of the model.

Simple Models - ABC

Individualist models of behaviour focus on different components of people's decision making processes, and how these then lead to actions. They range from very simple models to very complex ones. However, most follow a basic structure that is described in terms of "ABC" – Attitude Behaviour Choice/Context/Constraint (different people have changed the emphasis of the 'C' at different times but the general principle remains much the same). These models are very instrumental in their view of behaviour. They treat people as more-or-less rational, independent individuals who decide what they want to do, and then are free to act on this intention give-or-take sets of identifiable constraints or barriers. Because of their strong grounding in traditional economically rational views of behaviour, these types of models have been extensively adopted by government.

Figure 1: Linear model of decision making and behaviour

Figure 1 shows a simplistic model of this rational, individualist decision making process. The individual has a range of attitudes and preferences. On the basis of these, and in the context of relevant information, he/she forms an intention to act in a certain way. This intention is then enacted – resulting in "behaviour".

[4] Triandis, H., 1977. Interpersonal behaviour. Monterey, CA: Brookds/Cole

Triandis' Theory of Interpersonal Behaviour

Gradually, this very simple view of decision making has been expanded to take into account a number of other factors that have been demonstrated to be important in forming behaviours. Figure 2 shows a diagram[5] of Triandis' Theory of Interpersonal Behaviour. A recent review of behaviour change models in the context of domestic energy usage highlighted this as an advanced, although comparatively complex model, and concluded that it is "particularly useful in relation to energy consuming behaviours, much of which are based on habits and routine" (Sussex Energy Group, 2007[6] p17 & 23).

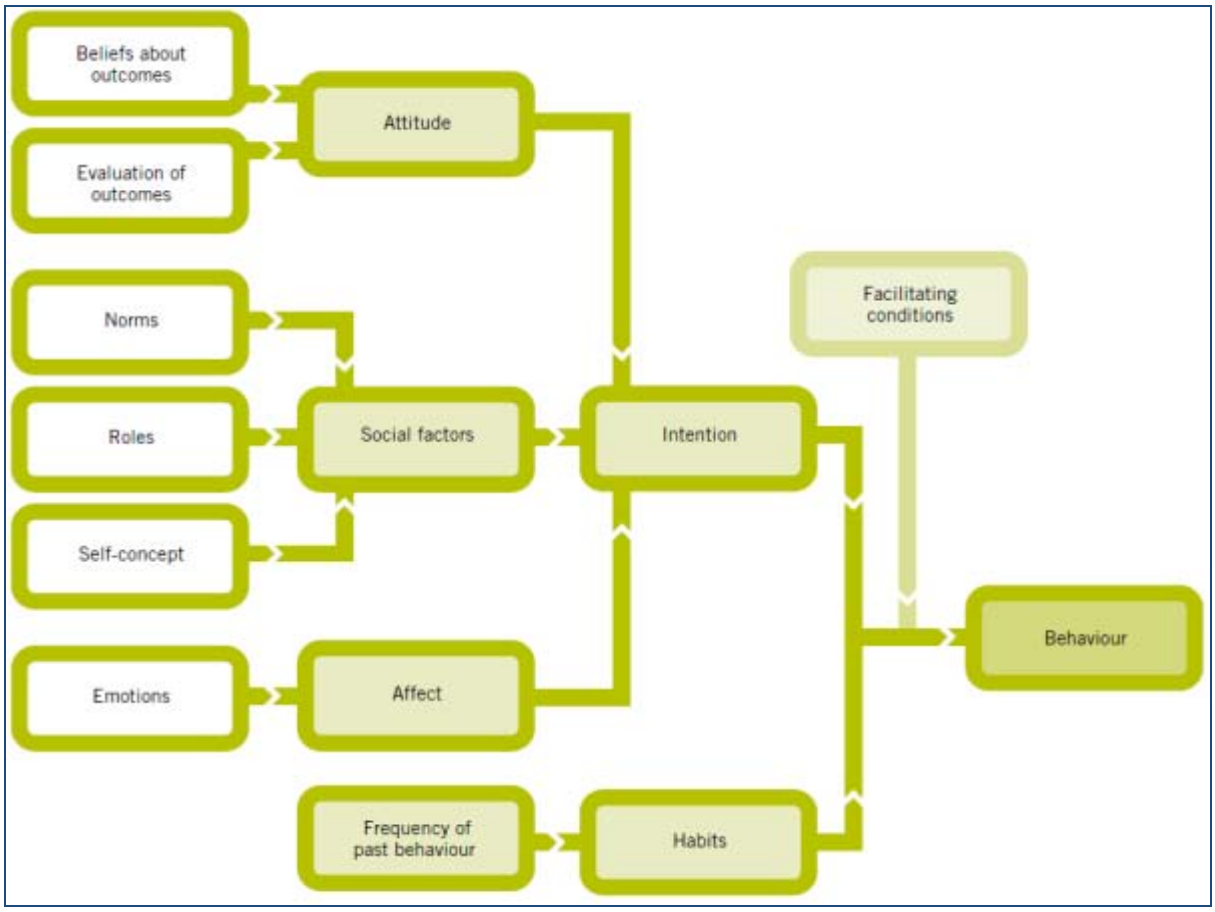


Figure 2: Triandis' Theory of Interpersonal Behaviour (1977 – reproduced from COI, 2009)

Whilst this model might look initially very complex, all the different boxes are there to help! The basic core of the model that is most important in this paper are the 4 boxes on the right-hand side: Intention, Habits, Facilitating Conditions and Behaviour (see Figure 3). These set out the basic relationship of conscious/sub-conscious decision making (Intention), automatic routines and actions (Habits), and external barriers or enablers (Facilitating Conditions) in contributing to what we finally see as Behaviour.

[5] Diagram taken from COI, 2009 http://coi.gov.uk/documents/commongood/commongood-behaviourchange.pdf
[6] http://www.sussex.ac.uk/sussexenergygroup/documents/seg_consumer_behaviour_final_report.pdf

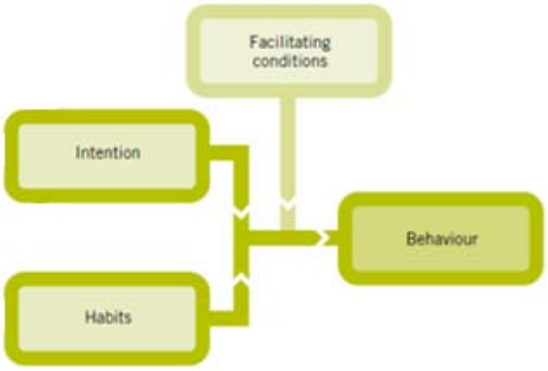
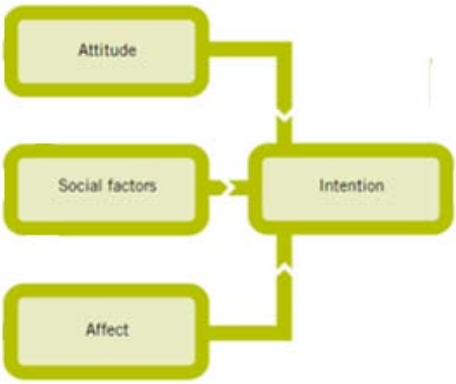


Figure 3: Cut-down version of the Triandis Model

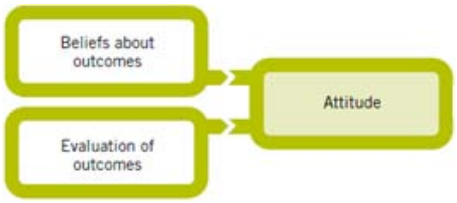
The following section describes all the elements in this model in more depth. In general though, this model represents a person's actions as being controlled by a mix of their intentions and their habits and routines (Triandis originally ranked the importance of these factors as 1: Habit, 2: Intention, 3: Facilitating Conditions). An example of a habit intervening might be where someone intends to get up at 6am one morning to go to the gym before work, but finds themselves still sleeping till 8am as usual. In addition to this it allows for these to be further determined by 'facilitating conditions', a term that is used to represent a wide range of barriers to action, or aids and incentives. For example, if we were looking at how people made travel decisions with respect to public transport, the presence or absence of a bus service going from near where they lived to near where they wanted to go would be included as a "Facilitating Condition". Internal resources such as The affordability of the bus, or their ability to be on time to catch it could also be considered here.

Intention



'Intention' represents the individual's decision making process, what a person consciously intends to do. Intention is made up of three key elements: attitudes held by the individual themselves; social factors relating to how the person sees themselves and their actions in relation to wider society; and 'affect' which represents a number of, mainly sub-conscious, emotional factors, including things like mood and values. Note that these three factors inter-relate, as well as all contributing to intentions (eg. attitudes contain an element of emotion). The purpose of this model is to try and simplify things, however the true complexity of the situation should not be forgotten!

Attitude

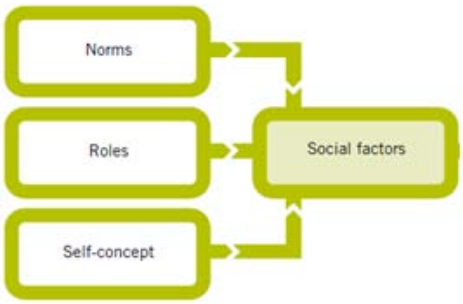


'Attitude' within this model is short for 'Attitude towards the behaviour in question', and is based around a combination of both beliefs about the outcome (such as its desirability in terms of its benefits for the individual and others) and an evaluation of the outcomes of the behaviour (e.g. how likely is it to succeed, and whether the desired benefits are worth any associated risks).

These elements will be shaped by a wide range of factors, such as underlying personal values, as well as knowledge and beliefs about the relative costs and benefits of the behaviour (which in turn are likely to be affected by actual external factors determining the costs and benefits such as prices and technical effectiveness).

It is important to note that the factors which lead to the development of this attitude extend well beyond the individual, and beyond anything that can necessarily be remedied in the short-term. For example, time pressures set by employers, or schools might significantly affect how different transport modes are compared, and personal skills such as driving or cycling proficiency will also help determine travel choices. Attitudes may also develop as a result of actually carrying out activities, for example bad experiences of getting builders to do work on one's house might lead someone to develop a negative attitude towards builders and building work in general.

Social Factors



In addition to personal attitudes towards behaviour, certain social factors have been identified as playing a role in determining behaviour. These social factors relate to the ways in which people see their place in society, and how they view other people. Probably the most influential of these social factors are people's perceptions of 'social norms'. Whilst this perception is likely to be influenced to some degree by what other people actually do, what a person *believes* other people do is more significant.

Roles form another social factor. Roles were defined by Triandis as "sets of behaviours that are considered appropriate for persons holding particular positions in a group". Whilst norms relate to how people generally act in society, roles relate specifically to people in similar positions to the individual in question and how they might be expected to act. This may include narrow roles regarding who is the main breadwinner in the household *("I earn the money so I can*

spend as much as I like on energy"), or who manages and pays the bills (*"I need to ensure that bills are as low as possible so that we can always afford them"*). It may also involve much wider roles, such as societal responsibilities like those targeted by the "Are you doing your bit?" campaign[7] which sought to get people to understand that the large problems faced at a national or global level in terms of issues like climate change, waste, and transport, were often caused by the sum of lots of individual actions, and that therefore everybody had a role to play in resolving them. It might also include feeling a responsibility to demonstrate 'leadership'. Any individual may occupy a multitude of roles (e.g. parent, worker, sports fan, driver, pedestrian etc.) and may shift their behaviour accordingly depending on the situation they find themselves in.

Self-concept, one's perceived identity, plays a role in forming behaviour for example, by determining whether a person sees themselves as 'a good person' or even 'somebody who saves energy'. This identity may well be more complex than this, being based on a view that they are "Someone who saves energy to help protect the environment", "Someone who saves energy so as not to be wasteful", or "Somebody who saves energy in order to save money".

Self-concept is an important factor in determining whether action to promote certain behaviours may have a "spill-over" effect. For example, it has been suggested that if energy saving is promoted as a "low–carbon" or a "pro-environmental" action, it may lead to the triggering of other low-carbon/pro-environmental behaviours , such as increased recycling, or reduced car usage. If, however, it is simply promoted as a way to save money it is may be less likely to encourage other energy saving changes. Evidence for the existence of an environmental spill-over effect is however very weak, and it is complicated by what is termed the "value-action gap" where there is often little correlation between people professing pro-environmental values, yet not managing to enact them (this may often be caused in part by facilitating conditions not being in place).

Affect

'Affect' is a psychological term referring to the experience of feeling or emotion. Two common elements might be a person's mood at the time of making a decision, or their underlying set of usually unquestioned, values. Within the decision making process, emotions may play two main roles. Firstly, they might directly steer behaviour in certain directions, for example the act of doing something 'good' may promote a feeling of warmth of well-being, or conversely doing something 'bad' might provoke feelings of guilt or self-hatred. However, emotions can also play a role in sub/pre-conscious elements of decision making through subtle and even un-related prompts that lead a person to feel positive or negative emotions that may significantly affect a decision. An example of this is that the inclusion of a picture of "an attractive, smiling female" on advertising material for loans led to a significant increase in people's uptake equivalent to a 25% decrease in the loans interest rate[8]. Similar subtle messages may also have positive or negative consequences with regard to the impact of energy efficiency information.

[7] http://www.oecd.org/dataoecd/29/19/2397715.pdf

[8] MINDSPACE p25 http://www.instituteforgovernment.org.uk/images/files/MINDSPACE-full.pdf

Beyond Intention

The next section of the paper discusses the roles of habits and facilitating conditions within the Triandis model. Figure 4 shows how these are seen as impacting on behaviour after the conscious and sub-conscious formation of intention.

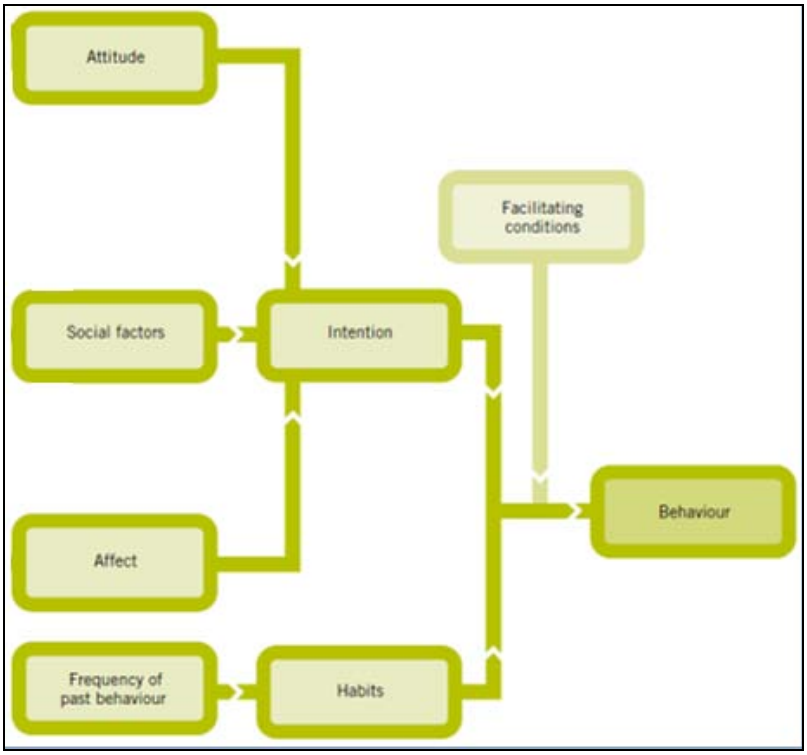


Figure 4: The relationship of Habits and Facilitating Conditions to Intention in the Triandis model

Habits

In addition to Intention, unlike many other behaviour models, the Theory of Interpersonal Behaviour places "habits" as a significant, and potentially most important, influence on behaviour. Habits are seen as routine behaviour which is enacted without having to go through the conscious process of intention formation – hence habit represents an alternative, and completely separate path to behaviour in the model. When the TIB model was originally developed in 1977, very little work had been undertaken with regard to what constitutes a habit, and how they come to be formed. Within the model they are seen as being determined simply by the 'frequency of past behaviour'. More recent work has identified that for behaviour to become a habit, it needs not just frequency – but also 'automaticity' (defined by Bargh (1994)[9] as: lacking awareness of our action; lacking conscious intent; being difficult to control; 'having efficiency', and also a stable context (habits cannot be continued if circumstances are significantly altered). Some recent work has suggested that it takes (on average) 66 days of

[9] http://www.yale.edu/acmelab/articles/Bargh_1994.pdf

repetition for habits to form[10] and for the action to become automatic and routinised (an example might be turning a TV off at a wall rather than leaving on standby). The propensity for a behaviour to become routine, and the speed with which it does will vary greatly.

As highlighted above, Triandis' TIB model fits into the Individualist approach to energy behaviour, drawing mainly on the Economic and Psychological theories. It treat individuals as, by and large, rational decision making creatures that have a number of sub-conscious tendencies that sometimes lead them into making decisions that do not appear to be in their maximum self-interest (as judged from an external, 'objective' viewpoint). Within this framework habits are simply a special category of repeated behaviour, albeit that they have become automatic and are therefore difficult to change. It is presumed that, in the first instance at least, the (now automatic) behaviour arose, or was constructed, from rationally based intentions and behaviour. This view of "Habits as Construct" is only one way of looking at habits. Another approach, based on a sociological approach to energy behaviour, that treats "Habits as Practices" will be described later.

Facilitating Conditions

Within Triandis' model, once Intention and Habits have interacted to determine what behaviour will be attempted, this behaviour can be enacted only if permitted to by 'Facilitating Conditions'. This term is used to refer to any external factors or internal resources which help, hinder or prevent a person translating their intentions or habits into enacted behaviour. In reality these play a more complex role, as knowledge about these factors is also likely to influence the formation of intention, rather than simply acting as a barrier once decisions have been made. Examples of facilitating conditions would include, with regard to transport decisions, whether or not practicable public transport is available to the desired destination, or in terms of energy efficiency, whether a person owns or rents their home, if it has hard-to-fill cavities, whether any listing or conservation area precludes solid-wall insulation, if the roof faces in a suitable direction for solar PV, whether appropriate financing schemes are available, etc.

A lot of behavioural work has tended to focus on the removal of 'barriers' in this context, this stems from the traditional economic view that positive net present value is seen as sufficient reason for acting in a certain way. From this perspective the emphasis has been on things that prevent people from acting in a purely economically rational way.

It is however very important to also consider the provision of 'enablers' as well. This puts a much more positive light on this area. A major example of enabling has been the provision of door-step recycling collections. Prior to this, it wasn't that people couldn't recycle items, but door-step services made it very simple for them to do so. Defra's work on environmental behaviours clearly put enabling within their "4 Es Model": Encourage, Enable, Engage, Exemplify (see Annex 1 for more information on this).

[10] http://www.ucl.ac.uk/news/news-articles/0908/09080401

How to Work with the Triandis Model

The components that lead to the formation of 'Intention' within the Triandis model (i.e. Attitude, Social Factors, and Affect) are comprised of separate elements that might be able to be worked with in order to influence people's decision making processes and consequent behaviours.

As well as considering the economic assessment of benefits in forming people's attitudes and intention, there are currently two significant bodies of work that explore other psychological factors in intention formation. The first is behavioural economics, which looks at sub-conscious automatic mental processes which steer us into certain non-rational, less rational, or apparently irrational patterns of behaviour. The second looks at how our basic values and self-identity create foundations on which our intentions and expectations are formed.

Behavioural Economics

Alongside legislating to prohibit certain activities, or prescribing how, where and when they can be done, economics has been the major tool by which government has sought to steer people's behaviour. Traditionally, economics has assumed that correct pricing and better information is sufficient for people to make decisions. However, over the last 50 years evidence from psychology has helped to show people do not always make strictly rational decisions, often because elements of these three influences on intention (Attitude, Social Factors, and Affect) can impact on decision making.

"Economists often use the assumption of rational maximisation of self-interest as a useful tool for analysis, especially as a simplification, but actual behaviour can be idiosyncratic and psychologically complex. Humans are not always consistent and are certainly not omnisciently rational as in some neoclassical economic models." Government Economic Service[11]

This application of psychology to explore these departures from economic rationality has become termed "Behavioural Economics". It has become increasingly popularised over the last few years through books such as "Yes! 50 Secrets from the Science of Persuasion"[12] and "Nudge: Improving Decisions About Health, Wealth, and Happiness" [13]).

The basic premise of Behavioural Economics is that rather than making extensive calculations regarding the utility of every option available to us, our brains are hardwired to make a range of mental shortcuts or *heuristics*, which have evolved over time to be of benefit to us. This evolution is thought to have occurred a very long-time ago in the development of our brain known as the or *amygdala* or "lizard-brain". This means that we have can see two separate and distinct systems in our brains that determine our behaviour:
Reflective System: The part of the brain we consider rational, that makes careful, considered judgements, in a self-aware manner.

Automatic System: A range of sub-conscious processes, that allow us to respond very quickly to environmental circumstances (such as fight-or-flight mechanisms), or to follow routine behaviours (such as commuting) with minimal mental effort. The simple decision making

[11] Behavioural Economics: A guide for Economists in Government, GES Standing Analytical Advisory Group 2009
[12] Goldstein, N Martin, S and Cialdini, R (2007)
[13] Thaler, R and Sunstein, C (2008)

processes that happen here also allow us to do a number of different things at the same time (such as drive and talk on a mobile phone simultaneously – illustrating that whilst the automatic system allows us to do many things without them being the full focus of our attention, it does not necessarily allow us to do them at peak performance!).

Whilst some of the basic patterns of these *heuristics,* or short cuts, are fixed in our brain they can be used in very adaptive manners that may change over time, and make it hard still to tell exactly how someone might behave on the basis of them.

MINDSPACE

A vast amount of work has been done in the fields of social psychology and behavioural economics. Recent work by the Institute for Government has conveniently packaged much of the work in this area in the context of government policy-making. The work is based around the MINDSPACE[14] mnemonic (below) which sets out a nine key elements for policy makers to consider when using this approach in behaviour change work.

Messenger: We are heavily influenced by who communicates with us. People will respond differently to what is said by government, businesses, friends and family, etc.

Incentives: Our responses to incentives are shaped by predictable mental shortcuts, such as strongly avoiding losses. People react differently to being told that insulation will "save them £100 per year", compared to being told that they are currently losing £100 from their home being poorly insulated.

Norms: We are strongly influenced by what other people do. If messages suggest that something is a problem because so many people are doing it (such as people taking short-haul flights), this may inadvertently reinforce the behaviour as normal and may lead to increase in the behaviour.

Defaults: We tend to 'go with the flow' of pre-set options. If thermostats were built to automatically set/reset to 18°C people would probably tend to use less energy.

Salience: Our attention is drawn to what is novel and seems relevant for us. The Act On CO_2 campaign specifically advertised the benefits of insulation in DiY stores, where it reached people who were already involved in carrying out work on their homes.

Priming: Our actions are often influenced by sub-conscious clues. Real-time energy displays in public places may reinforce the importance of reducing energy usage.

Affect: Our emotional associations can powerfully shape our actions. Messages about insulation often convey notions of 'warmth' in order to trigger positive emotional responses.

Commitments: We seek to be consistent with our public promises, and reciprocate acts. Getting people to make a public commitment, such as the 10:10 campaign, has been shown to increase the change of them continuing to maintain this behaviour in the long-term.

[14] http://www.instituteforgovernment.org.uk/content/133/mindspace-influencing-behaviour-through-public-policy

Ego: We act in ways that make us feel better about ourselves. People may be more inclined to change behaviour when encouraged to be good, as opposed to being discouraged from being bad, or with regard to comparative billing they may be inclined to be "better than average".

Not all of these elements are relevant or able to be used in every circumstance, but the MINDSPACE framework is a very useful prompt and structure for beginning to approach most of the factors that lead to the formation of *Intention* within this model.

Annex 3 provides some examples of how this structure can be applied to elements of energy behaviour, the reader is strongly recommended to read the MINDSPACE document itself.

Although behavioural economics tends to emphasise the formation of intention (as described in the Triandis model) as being partly based on conscious rational processes and partly reliant on these sub-conscious patterns and heuristics, it is also worth considering how the the Triandis model's view of habits as automatic, repeated behaviours also fits in the view of dual reflective and automatic systems. Again, this is a point where these models may be oversimplified as the various dual paths of Reflective/Automatic and Intention/Habit tend to operate at the same time and interact rather than being a case of either/or.

Behavioural economics also tends to focus on the point of decision making, and does not deal strongly with some of the underlying factors discussed above in Triandis' model, such as values, roles, and self-concept which can be grouped together and looked at as representing 'Identity'.

Values and Identity

How people perceive themselves is often crucial to how they consider it appropriate to act– whether by wanting (consciously or sub-consciously) to follow social norms, or by wanting to try and mark themselves out as different.

Within a number of campaigning groups (particularly WWF[15]) there has been a recent move to emphasise the need to focus on 'engaging' specific pro-social (humanitarian) or pro-environmental values within people and society in order to achieve significant shifts in behaviour (particularly with regard to climate change). Like behavioural economics, the arguments put forward suggest that the role that "facts" and rational analysis play in our decision making is limited. However, rather than focussing on our automatic system and the role of external prompts, this body of work focuses on the role of identity and values in driving our decision-making. This includes conscious and sub-conscious impacts on decisions and behaviour . Within the NGO sector this approach is being termed 'The Common Cause Approach" (from its focus on bringing together a range of pro-environmental and pro-social messages) or "Working With Values and Frames"[16].

[15] WWF (2010) Meeting Environmental Challenges: The Role of Human Identity
http://www.wwf.org.uk/what_we_do/campaigning/strategies_for_change/?uNewsID=3105
COIN, CPRE, FoE, Oxfam, WWF(2010) Common Cause: The Case for Working with our Cultural Values
http://www.wwf.org.uk/wwf_articles.cfm?unewsid=4224

[16] http://valuesandframes.org/

This approach is concerned with tackling what it terms "bigger-than-self problems", problems such as climate change, global poverty or biodiversity loss. These are problems where it is not in an individual's immediate self-interest to engage in resolving them. When trying to get people to act in relation to these issues it is argued that it is necessary to, not just provide information, but to actually engage with their values.

The work identifies two broad types of values held by people:

Intrinsic values which see certain things as having inherent worth, such as a sense of community, and
Extrinsic values which are dependent on the response they elicit from others, such as social status (e.g. they seek praise or reward).

There is extensive empirical evidence that these two value sets operate antagonistically to each other, so whilst intrinsic values are associated with concern about, and acting to help address bigger-than-self problems, extrinsic values lead to less concern about other people or the environment. Messages that activate one set of values have been found to suppress the other set of values.

To provide an example, valuing 'money' is often seen as an extrinsic value. Beyond what is needed for a basic lifestyle, money is not directly worth anything – its value comes through attaining other things, including the status which it gives people in contemporary life. So, if for example, energy efficiency measures are sold to people on the basis of 'saving money' this message activates extrinsic value sets, and suppresses intrinsic value sets.

So whilst in the short-term people may act in the desired way and install insulation, the message is detrimental to developing a wider concern about the problems of climate change. This may then mean that people are less likely to undertake more expensive energy saving measures, or to buy 'green products' that cost more than conventional products[17]. This is particularly important in the long-term as Marginal Abatement Cost Curves indicate that only a limited number of the measures that need to be employed to meet climate targets are likely to have net negative costs.

For a fuller explanation of this work, the reader is strongly recommended to read (at least the summary of) the Common Cause report.

Values and Action

There is a wide range of work which argues for the existence of a "value-action gap" whereby people's behaviour is not seen to relate closely to their expressed values. For example many people advocating reductions in personal carbon emissions may themselves carry out a range of high-carbon activities. This does not necessarily imply that values do not relate to actions, only that they are not the only determining factor, and that other things come into play such as the social norms, facilitating conditions or habits, as described earlier.

[17] See page 9 of the WWF report
http://assets.wwf.org.uk/downloads/meeting_environmental_challenges___the_role_of_human_identity.pdf

It may be worth considering the role that values might play in a very specific instance, such as the context of "take-back" or "rebound" in relation to domestic insulation[18]. If someone has been persuaded to install insulation in relation to extrinsic values (e.g. with a "saving money" message) they *may* subsequently choose to make a potential trade-off between 'profit' and 'comfort' and feel quite content that in turning the heating up the only cost is to their own pocket and that the expense is worthwhile (money is only worth what it can buy, and increased warmth may be highly valued). However, if a message has been given that appeals to intrinsic values (such as protecting the environment) then the argument for turning the heating up in favour of increasing their own comfort is much weakened and there *may* be a lower risk of significant rebound occurring.

The role of money within decision making is complex. It seems to be the case that a lack of basic security undermines the importance that people attach to intrinsic values (those which are most important in motivating pro-environmental and pro-social behaviour). So for some demographics - the poor, or financially insecure – saving money may be a helpful message. However, concerns about money and wealth are generally antagonistic to pro-social and pro-environmental concern and therefore messaging should be avoided that identifies the opportunities for money saved to be used in high-status consumption, even where this is 'green' consumption.

Whilst putting out messages on the basis of "save money AND save the environment" might be a way of counteracting this, there is a danger that a reliance on this approach will lead to assumptions that everything that needs to be done to protect the environment will save money, and a quick look at Marginal Abatement Cost Curves clearly suggests that this will not be the case for very long. There is also some evidence that messages which make simultaneous appeal to opposing values (e.g. "save money AND save the environment" may actually be *less* effective in engaging an audience than a message that is consistent in its appeal to a particular set of values, *even where these values are opposed to those held most strongly by the target audience*.

Government has a role to play in strengthening in people's underlying values by attempting to engage with some of the pro-social/environmental values or 'deeper frames'. Evidence suggests that everybody holds all of the values to some degree, and therefore what is required is a great emphasis on the 'activation' of these values, as opposed to the notion of having to completely *change* some people's value sets. It is impossible to take a stand that is value neutral, attempting to do so simply perpetuates existing values, or allows other, overtly non-neutral, messages to dominate. It is also important to consider that messages about values can be conveyed not just by verbal messages, but also by actions, policies and social institutions as well.

[18] For more detail on Rebound see UKERC study 2007 http://www.ukerc.ac.uk/support/tiki-index.php?page=ReboundEffect

Socially Orientated Models

The previous section looked at behaviour in terms of individual decision –making and action. This section looks at behaviour in a social context – taking the focus away from the *actor* and putting it instead on the *actions*. This approach relates largely to the sociological and educational theories discussed at the start of the paper, and puts forward a different model of behaviour that looks at three elements (Materials, Meanings and Procedures)[19] that can be seen to comprise social 'practices'. Rather than putting this forward as an entirely separate way of looking at behaviour, by putting this approach in the context of looking at habitual behaviours, it can be seen as being complementary to the individualist approaches, and so can be linked in with the Triandis model to show other drivers on behaviour that lie well beyond individual decision making process[20].

Why is a socially orientated approach helpful?

Sociological approaches to energy behaviour have generally been used only to *study* energy use, rather than to design and implement interventions. They are included in this document for two key reasons. Firstly, individualist approaches to behaviour have often not been as effective at creating change as been expected or hoped, they also come with a range of concerns regarding issues of inclusivity, scaleability and the ethics of intervening in an individual's private space. Socially-orientated approaches (stemming from the sociological and educational theories outlined above) can provide a useful way to understand the complexities or the structures and processes that help generate certain practices, and then hold them in place.

Secondly, socially-orientated approaches should be able to help develop new strategies for changing behaviour – ones that involve a much wider range of stakeholders than those that would usually be associated with the target behaviours. This inclusivity sits well with aspirations for the market and 'society' to play greater roles in delivering policy objectives.

Thirdly, it can be argued that practice based interventions will involve little extra cost. Whilst the more conventional individualist approaches often tend to sit on top of existing policies, acting as a corrective 'patch', social practice based interventions may only involve getting multiple stakeholders to continue what they are doing, just slightly differently.

This section looks at the sociological "Theories of Practice", and how they can be related to the individualist approach to behaviour outlined above so that they can clearly be used to enrich and supplement conventional understandings of behaviour, rather than as a completely separate approach.

[19] This is best described in Darnton, A, Verplanken, B, White, P and Whitmarsh, L (2011). Habits, Routines and Sustainable Lifestyles*: A summary report to the Department for Environment, Food and Rural Affairs.* AD Research & Analysis for Defra, London. But is derived from extensive work by Prof. Elizabeth Shove at Lancaster University http://www.lancs.ac.uk/staff/shove/

[20] Again, it is advisable to note at this point that the aim of this guide is to suggest how these theories might be integrated at a policy level. Academics have differing views regarding the extent to which these approaches can be integrated at a theoretical level.

Habits as Practices

Within Triandis' linear 'ABC' model of behaviour described above portrays behaviour as the result of a constant stream of choices made on the basis of (largely) rational decisions made by individuals. In every case, an individual's behaviour is determined by their own weighing up of their attitudes to the behaviour in question, their conscious and sub/pre-conscious views of how they and their behaviour relate to wider society, their emotions regarding the issues, their previous decisions, and finally a whole range of possible external factors that will guide or prevent their chosen behaviour. The Individual is at the centre of this whole process. This approach can be effective – particularly when taken to its extreme, as illustrated by interventions such as Personalised Travel Planning[21]. However, with 60 million individuals in the UK it may be hard to calculate exactly which levers need to be pulled, and which drivers need to be in place to get everybody to behave in the desired way.

One sociological approach to energy behaviour looks at behaviour in terms of 'social practices'. In this approach, *the individual is no longer taken to be the unit of enquiry*. Instead focus is moved to the actions (or practices) themselves. As a simple example of this, it tells us very little to know why an individual might decide to have a cup of tea at any given moment. We possibly get a response such as "He was thirsty", or "The coffee had run out". Instead we can look at the "practice" of tea drinking itself – an activity that has come about through a long history involving our imperial past, modern technologies like the electric kettle, the move from loose-leaf tea to teabags, the introduction of mugs as opposed to cups and saucers, public health and the Victorian temperance movement, and a range of cultural and psychological associations with things like warmth, comfort and refreshment[22].

Applying a social practices approach to policy issues is relatively new. It is however rising in profile, particularly with regard to the problem of habits and routine behaviours. As discussed above, within a psychological approach, the analysis of habits is based primarily on the simple fact that they are repeated behaviour. By approaching habits as routine practices we can begin to explore why so many habits are shared by so much of the population. Widespread social practices do not arise from a large number of individuals deciding independently that a certain goal should be achieved in a certain way. *"Practices exist beyond specific performances, they consist of interconnected sets of norms, conventions, understandings, embodied know-how, states of emotion, arrays of material things*"[23].

The "Three Elements" Model

One approach that has been put forward for approaching policy issues from a social practice perspective is using a three elements model (see Figure 6 – showing three elements diagram indicating practice as the dotted line, emerging and being locked in place by the three sets of societal factors).

[21] See http://www.dft.gov.uk/pgr/sustainable/travelplans/ptp/

[22] To get an idea of the complex range of issues involved listen to Radio 4's History of the World in 100 objects on "A Victorian Tea-Set" http://www.bbc.co.uk/programmes/b00v71qr

[23] Shove, 2009 http://eetd-seminars.lbl.gov/sites/eetd-seminars.lbl.gov/files/Shove.lbl09-web.pdf (after Reckwitz)

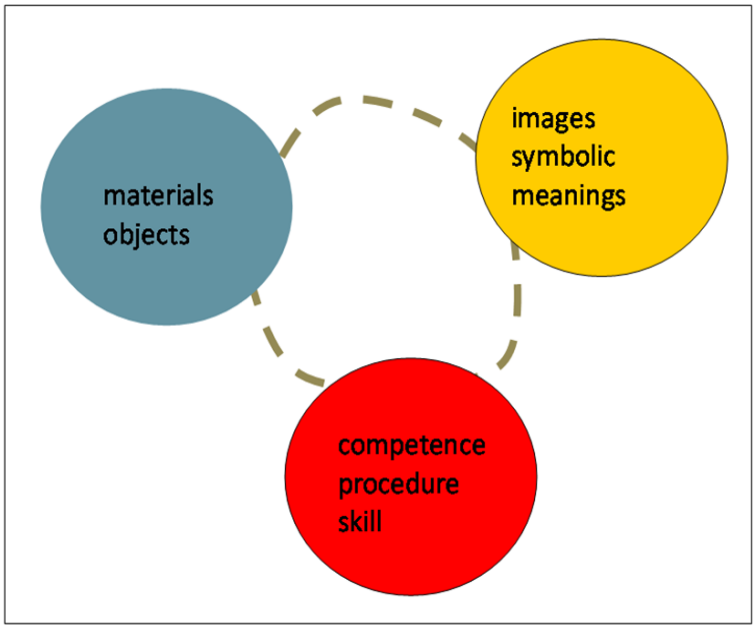


Figure 5: Three Elements model (from work by Elizabeth Shove[24])

Drawing on a long history of sociological work in this area, Shove's recent work has defined three elements which come together as a social practice:

Materials: Physical objects which permit or facilitate certain activities to be performed in specific ways (such as the move away from cups and saucers to mugs, the introduction of the teabag removing the need for a teapot, the introduction of the electric kettle).

Meanings: Images, interpretations or concepts associated with activities that determine how and when they might be performed (such as the notion of a tea-break which posits tea as a refreshing or revitalising activity, or associations with times of day such as 'English Breakfast Tea').

Procedures: Skills, know-how or competencies that permit, or lead to activities being undertaken in certain ways (such as "one for each person and one for the pot", "milk first or after?" or the art of the Japanese Tea Ceremony).

These three elements are not all independent from each other, there will be interactions. For example the need to pour milk first (Procedure) was due to the fragility of bone china tea cups (Material) which would shatter when filled with boiling liquid.

Practices (represented by the dotted circuit) can be seen as *emergent properties*, arising from the interaction of these elements, they do not come about as a direct and linear result of the various elements. The elements are already in circulation within everyday life, and appear within other social practices (e.g. kettles also fill hot water bottles, and beer is also understood as being refreshing). They become normal through a gradual alignment of the three elements,

[24] See The Choreography of Everyday Life: Towards an Integrative Theory of Practice http://www.lancs.ac.uk/fass/sociology/staff/shove/choreography/front.htm

resulting in new sets of societal expectations or conventions. The implications of this approach include accepting that policies will need to be designed to encompass a wide range of actors, and they may need to accept a more complex approach as to how specific outcomes might be achieved.

Policies may need to be designed to involve a co-ordinated mix of interventions which may lead to challenges in terms of evaluation as each intervention may only have a small direct impact, but the whole may be greater than the sum of the parts.[25] Influencing changes in practices will necessitate the action of a range of actors across society including government, business and industry, NGOs, local communities and the media.

This may not be as difficult to conceive of as it might initially seem. Increasing focus on localism, Big Society and the role of the market all point in the direction of devolving decisions, actions and control to parties other than central government. The involvement of this wide range of actors does not necessarily preclude the potential for very significant actions to be taken by government though. For instance, in terms of material elements, state involvement/investment/intervention has historically played a very significant role in changing practices, for example providing sewerage systems, road and rail infrastructure, the national grid etc. However, it should not be assumed that providing infrastructure alone is sufficient to change behaviour/practices e.g. providing charging points for electric vehicles. The involvement of an array of actors across society is essential for implementing a social practices approach to policy making and is likely to result in the development of very different tactics compared to focussing on individuals.

For a more detailed analysis of Habits as Behaviours and as Practices – see Darnton et al. (2011) Habits, Routines and Sustainable Lifestyles (EVO 502): Summary Report to the Department for Environment Food and Rural Affairs, March 2011

[25] This is already the case in transport policy where it is clear that attempts to achieve modal shift need to encourage and support the new modes, put disincentives in place for undesirable modes, and ensure that freed-up road space is protected from being filled up by new traffic.
http://www.dft.gov.uk/pgr/evaluation/evaluationguidance/existingnetworks/frameworkreport.pdf

Looking at Energy Practices

"If a building is set, regularly at, say, 22°C … [and] …If enough buildings are controlled at this temperature, it becomes a norm for that society at that period of its history, and anything different is regarded as 'uncomfortable'" - Humphreys (1995)[26]

Within the area of domestic energy efficiency there are a number of possible 'practices' that we can identify as relevant. Rather than simply looking at people's behaviour in using energy, the social practices approach emphasises looking at the activities themselves, how they are undertaken and the elements of which practices are constituted (such as material infrastructures or social expectations and conventions, competence and know-how). Examples of practices and why they might be of interest in terms of energy use include:

- **Seeking (thermal) comfort** particularly through the use of heating or air-conditioning to achieve specific temperatures that have been established as global norms;
- **Washing (both personal bathing and laundry)** with regard to changes in the reasons people wash, and methods they use that lead to increased frequency and consequently higher energy usage (e.g. through a move from seeing them as a means of removing dirt, to using them to achieve a state of 'freshness');
- **Home improvements** and how it might be easier to sell insulation as a 'home improvement' measure than as either a money saving, or environmental measure as people may already be engaged in practices around 'home maintenance' or 'improvement';
- **Entertainment** and the move towards much more energy intensive leisure activities from 'jumpers as goal posts' to FIFA on the X-Box, and 'sing-a-longs round the piano' to Simon Cowell and the X-Factor.

A summary of Elizabeth Shove's work on energy intensive social practices "Comfort, Cleanliness and Convenience" is provided in Annex 4. Readers are strongly recommended to at least read the paper and/or the full book.

As discussed above, this social practices approach is relatively new to policy-making, previously having been used primarily for academic analysis and even here, it is an emerging programme of work. At the very least, it can help provide a richer understanding of some of the hidden issues that prevent effective implementation of measures based on individualist perspectives, highlighting the often simple (sometimes complex) systems of ideas, skills, and objects that 'lock in' unsustainable behaviours. However, this approach is beginning to be used in policy to help analyse problems in a more holistic and systemic manner, suggesting solutions that bring together a range of different actors that are involved in the creation of these practices.

[26] Humphreys, M. (1995), 'Thermal comfort temperatures and the habits of Hobbits', in Nicol, F., Humphreys, M., Sykes, O. and Roaf, S (eds), Standards for Thermal Comfort, London: E & F N Spon. Quoted from E.Shove (2010) http://www.lancs.ac.uk/staff/shove/transitionsinpractice/presentations/cambridgefeb10.pdf

Figure 6 illustrates an example (taken from the Darnton/Defra Briefing note) looking at the practice of line drying laundry. This example helps to show how this tool can be used in workshop environments to show up complex interactions between very different areas of the social world – in this case highlighting how conventional working patterns or education policies can strongly impact on transport behaviours.

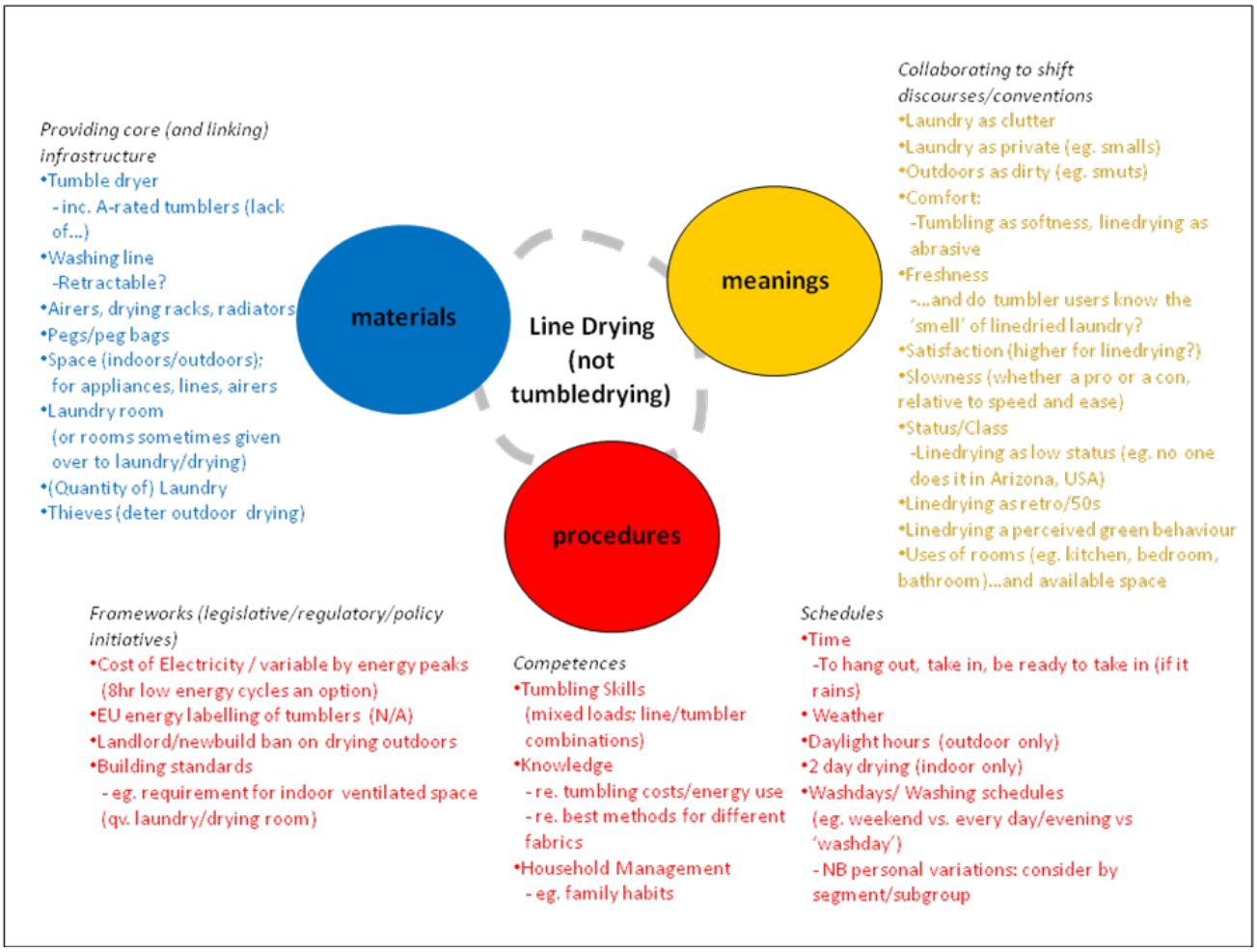


Figure 6: Three Elements model used to illustrate the practice of line drying laundry (from Darnton et al. 2011)

Differentiating Between Behaviours

One of the most important things to do when applying this multi-model approach to types of behaviour is to carefully consider how the behaviour of concern may be similar, or may differ from other behaviours that the approaches have been used on. In order to help compare behaviours they can be considered to vary in a number of ways. Four possible ways in which it might be helpful to discriminate between behaviours may be by actor, scope, durability and domain.

The ***actors*** of the relevant behaviour and target of any policies may range from single individuals, families and households, small social networks, wider communities and so on, up to whole sectors of society.

The ***scopes*** of behaviour of concern might range from isolated behaviours, to behaviours which structure or circumscribe subsequent behaviours, to interrelated or co-dependent behaviours, and so on, up to lifestyles as regularised patterns of behaviour. Do the means towards emission-reduction ends entail meat-free Fridays, vegetarianism, low impact living, or complete self-sufficiency?

The ***durability*** of the behaviour relates to whether it is a “one-off” behaviour (such as getting loft-insulation fitted), through to repeated behaviours that require sustained policy intervention (such as the need to keep financial measures e.g. a congestion charge in place), to behaviours with successively less required reinforcement (short-term provision of a free bus pass in the anticipation that a new habit may form), and so on, up to enduring behaviours (routinely turning off lights or appliances when not in use).

The ***domains*** of relevant behaviour refers to where the core target of change is thought to reside. Is the intention to simply change the way someone thinks or makes decisions, how the physically carry out a task, what equipment or technology they use to do something. Do the changes in behaviour rely on changes to institutions or infrastructures, or at scales of social, national or global? For example, might the aim of a policy be positive attitude formation towards substitutes for air travel, improved infrastructure for long-distance trains, or much wider reassessment of fashionable clothing that would permit lower internal building temperatures.

This four-fold framework is not intended to be a fixed and rigid set of criteria for categorising different types of behaviour. In practice, many activities of concern may involve a range of actors, or elements that have different durabilites. However, it should provide a starting point to help think about behaviours in a more structured way in order to better consider what behavioural models may be more or less applicable in any given situation.

Conclusion

This paper has described a number of approaches to understanding human behaviour and social practices, particularly in the context of activities that have significant environmental impacts and, especially in the context of energy usage. None of these approaches alone can provide a full and complete account of how and why people act as they do. It is unlikely that they can do this even if used together.

The challenge for the policy-maker is to use these ideas, theories, and tools to understand the behaviours of concern, and to help develop and implement effective, efficient and legitimate policies to change the way people do things, or to change the way that things are done (depending on your perspective!).

This document has been kept as short as possible – the descriptions of the approaches to behaviour that have been provided barely skim the surface of the work and evidence available in each of the areas. The reader is therefore strongly advised to carry out further reading in these areas to develop their understanding of the issues before attempting to implement any of them.

Further Reading

As a minimum, further reading should include:

MINDSPACE: Influencing Behaviour through Public Policy
http://www.instituteforgovernment.org.uk/content/133/mindspace-influencing-behaviour-through-public-policy

Common Cause: The Case for Working with our Cultural Values
http://www.wwf.org.uk/wwf_articles.cfm?unewsid=4224

Converging Conventions of Comfort, Cleanliness and Convenience
Converging Conventions of Comfort, Cleanliness and Convenience

Defra Briefing Paper on Habits, Routines and Sustainable Lifestyles
TBA

Annex 1: Defra 4Es Model

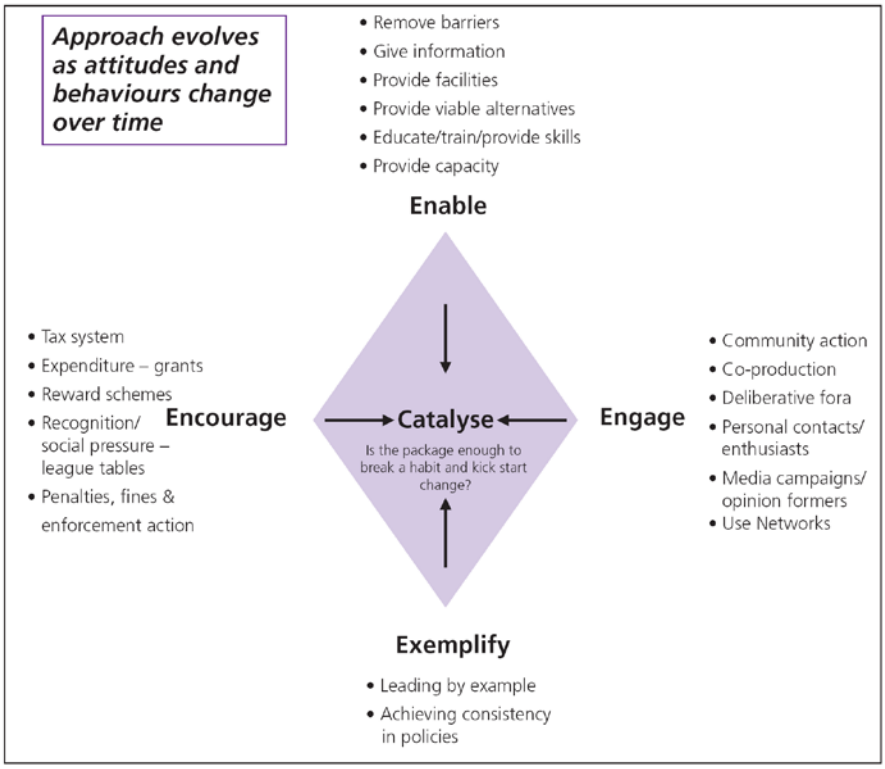


Figure 7: "Defra 4Es Model" from Securing the Future[27] (HM Govt, 2005)

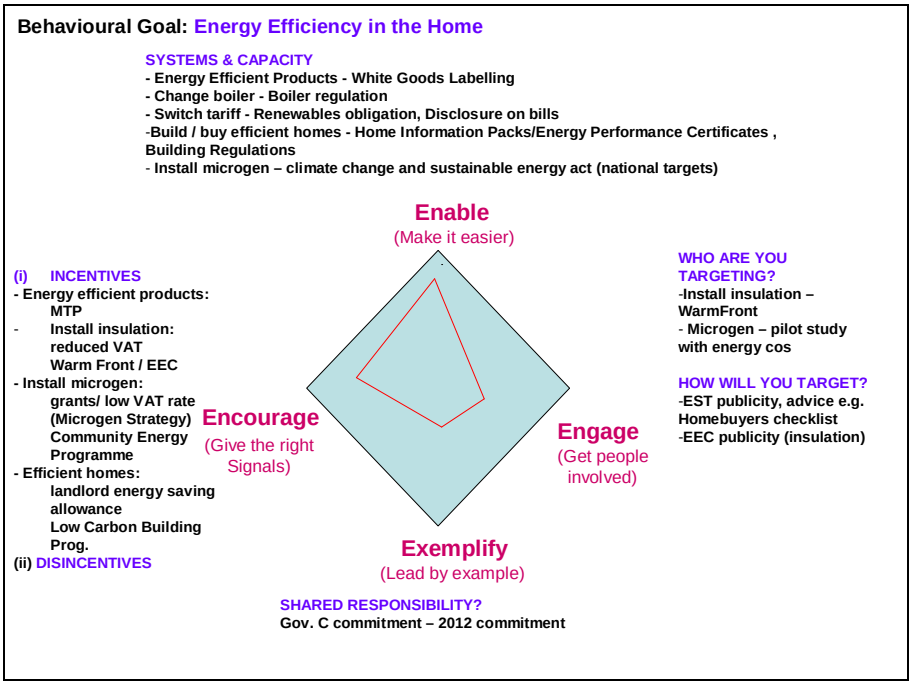


Figure 8: Application of Defra 4Es model to changing energy behaviour in the home (from Environmental Behaviours Strategy Scoping Report, Defra 2006[28])

[27] http://www.defra.gov.uk/sustainable/government/publications/uk-strategy/documents/SecFut_complete.pdf
[28] http://www.defra.gov.uk/evidence/social/behaviour/documents/behaviours-1206-scoping.pdf

Annex 2: Theories of Behaviour from Centre for Sustainable Energy, 6th EDRP Progress Report

4.2 Theories of how feedback works

Four theoretical approaches are relevant to these trials: sociological, economic, psychological, and educational. All are useful in assessing how behaviour might come to change in households, in the short or long term.

4.2.1 Sociological theory

Modern energy use is largely invisible, energy systems are complex, and daily practices are significant

Much gas and electricity usage in buildings is 'invisible'. It is also usually limited only by the apparatus or appliances through which it flows. Once switched on, these continue to use fuel until they are stopped by manual switching or automatic controls. This contrasts sharply with the use of solid or liquid fuels, which are used in finite quantities and can be seen, weighed and poured. Domestic energy use is also determined by a complex array of factors – physical systems/infrastructure, social norms, comfort preferences, and options for control. Sociological research analyses and demonstrates how many factors are normally within the control of householders, or beyond them. It highlights the importance of comfort standards and expectations, daily routines and practices (Lutzenhiser, 1993; Shove, 2003; Burgess and Nye, 2008). 'Practice theory' emphasises the combined roles of routines, artefacts and know-how (tacit knowledge) in influencing actions (e.g. Wilhite, 2008).

4.2.2 Economic theory

Energy is a commodity and consumers will adapt their usage in response to price signals

According to this strand of theory, we would expect financial incentives to have some impact on energy-using behaviour and energy-related investments, with the size of incentive affecting the scale of response. The literature on residential electricity demand-shifting in response to time-varying tariffs demonstrates this, as in the review of demand response programmes in the USA by Faruqui and Sergici (2008). Owen and Ward indicate possibilities and limitations to the application of classical economics in the UK, noting that

> *Household gas customers reduced their use by 12% overall from 2005 to 2007 in response to higher prices. However, in 2008, when the winter was colder, household gas use rose by 3%, despite prices rising in real-terms. There therefore appears to be some available price-response for household gas, but people will understandably choose extra heat rather than save money if the weather is very cold … Real price increases for electricity between 2005 and 2007 suggested a modest demand reduction in 2007. In 2008, despite real price increases, demand for domestic electricity rose by 2.4%. Around one-fifth to one quarter of household electrical appliance load could be 'discretionary' or price responsive – mainly wet appliances.*

(Owen and Ward, 2010b, p7).

The evidence for a rational-economic mechanism behind longer-term energy-related decisions is more mixed. If this were strong, we would expect far more investment in efficiency measures in the home than is the case, for a start – especially when fuel prices rise. Customers 'react in

quite different ways to price levels and price changes' and 'even if significant opportunities to save energy and money are present, only those with certain rationalistic styles may be able to appreciate that fact' (Lutzenhiser, 2002, p54). For the UK, a report by OXERA (2008) finds that [potential] energy savings had little or no influence on decisions to fit insulation or buy efficient appliances, in a survey of >1000 homeowners. OXERA saw this partly in rational-economic terms, as their interviewees had little idea of the costs and hassle factor involved in installing efficiency measures. But they also interpreted the findings as illustrating low levels of trust in government and the energy suppliers responsible for CERT measures. Recent attempts at explaining why suppliers are obliged to help their customers save energy (such as E.ON's recent campaign) may start to improve this situation. Reiss and White (2008) also offer a challenge to some of the classical economics-based theory of energy demand, using 5 years' worth of billing data for a random sample of 70k Californian households and showing how pricing, public appeals for conservation and information had a powerful effect on consumption. This was, though, in response to crisis conditions when it was clear that electricity supply was limited. As electricity supply margins shrink in the UK, this work may come to have more relevance.

Behavioural economics is a growing branch of theory that has something to offer to energy feedback studies, by analysing responses to financial, social or other prompts. It is now being applied to energy feedback programmes (e.g. Schultz et al, 2008).

4.2.3 Psychological theory

Energy use can be affected by stimulus – response mechanisms and by engaging attention

Early research on energy feedback demonstrated how people respond in ways that are influenced by context but are still fairly predictable. Fischer, in her review of energy feedback from a psychological standpoint, identifies the following 'likely features for successful feedback (… effective in stimulating conservation and satisfying to households)'.

- based on actual consumption (ie, accurate and trustworthy)
- frequent (ideally, daily or more often)
- involves interaction and choice for households
- involves appliance-specific breakdown [the review relates to electricity]
- given over a prolonged period
- may involve historical or normative comparisons (although the effects of the latter are less clear)
- presented in an understandable and appealing way.'

(Fischer, 2008)

As Fischer points out, the more clearly someone can link consumption to specific appliances and activities, the more clearly behaviour patterns become relevant to consumption (and the size of the energy bill). In the longer term, we could add that feedback over time can demonstrate the benefits of better insulation and more careful use of timers and thermostats, or the energy cost of new equipment or increased living space.

Abrahamse et al. (2005) cover a wider spectrum of research in their review of 'intervention studies' aimed at home energy conservation, taking into account 'antecedent information' (e.g. information or standardised advice tips, or goal-setting) as well as feedback (consequent

information). They point out that information may increase knowledge, but does not necessarily affect behaviour. Feedback is effective to the extent that it provides highly specific, relevant, *actionable* information, and a means of checking the effectiveness of actions. The authors conclude that 'single antecedent interventions are not very effective. Rather, we found an antecedent intervention's effectiveness ... to increase when combined with consequence strategies' (ibid., p283). From the psychological as well as the sociological viewpoint, then, combined approaches to complex behaviours seem to be indicated.

4.2.4 Educational theory

Energy use is a skill that is learned through experience in specific situations

The most widely-accepted theories of teaching and learning in this country are based on the idea that people *construct* meaning continually and incrementally, experimenting and building on what they know already (e.g. Kolb 1984; Chaiklin and Lave 1993). Energy users are not a uniform category of learners but a mixed-ability, mixed-age class. They have differing levels of skill and understanding, and different motives for learning. For example, they may be looking for understanding and 'right action' in relation to the environment; looking for what is 'wrong' with their consumption (and bills) with a view to saving money; trying to keep in tune with social norms; trying to work with new types of gadget, or some combination of these and other factors. (For an example of this non-linear approach to technology adoption and use, see Aune, 2001. She then adapts it to consider how people go about using energy in their homes in Aune, 2007). Energy-users also ascribe different *meanings* to information: the same messages will be used in different ways, according to the awareness of the person receiving them (Williams, 1983).

According to this type of theory, feedback has a role in teaching energy management skills, and in giving people a sense of their ability to control usage better. If they can experiment with energy in their homes or workplaces and see the consequences of their usage (feedback), the literature shows that they typically increase control over consumption and may form new habits. Effective feedback adds to what householders already know about their own 'energy system' – the nature of their home, appliances, comfort preferences, daily routines and exceptional events – and helps them discover what is within their power to change, day by day or over longer periods, such as switching off, cutting 'default' usage by altering settings, investment in efficiency measures or home alterations. Feedback is seen as a necessary element in energy education or the building of 'energy literacy', which has to take into account the mixed abilities and motivations of users – including chronic lack of motivation. Just as teachers are challenged by bored and disaffected students, so feedback providers are challenged by uninterested customers – the 'passive ratepayers' of a recent IBM study (Valocchi et al., 2009).

Kempton and Layne (1994) point out how selling energy is very different from selling 'solid' commodities such as groceries. The kWh is easy to meter, for the utility, but 'irrelevant' to the buyer. We cannot assume that people will know how to act in order to reduce demand, if they have little or no idea how much each end-use contributes to that demand, and how it might be altered. In educational terms, they need to be able to add accurate, trustworthy information (but information that they cannot easily get hold of themselves) to what they already know about their own energy-using habits. Ideally, a consumer needs to know the relative importance of different end-uses (disaggregated feedback), and also how effective his/her attempts to use less energy have been (historic feedback). The first of these is possible, approximately, if the customer pays attention to real-time information or to hourly data on a day-late basis. The

second is helped by more frequent and informative billing. All of these were made available to groups of customers in the course of the EDRP.

In the sociological approach, there is not much space for the ‘rational-economic consumer’ of classical economic theory. People use energy as they do because they have particular ideas about what comfort is and how to achieve it, because they have to work with particular types and designs of building and appliance, are susceptible to the marketing of new items and practices, and have developed their own understandings of how to operate the ‘hardware’ available to them.

For the EDRP, this type of theory suggests that improved feedback can make consumption *more visible*, bring it more within the *perceived control* of the energy user, and *demonstrate the success* or otherwise of different actions, behaviour patterns and investments. At the same time, sociological theory suggests that we should not expect much impact from single, stand-alone interventions, especially in the long term: energy usage is too complex for that.

Annex 3: Applying MINDSPACE to the Green Deal: Examples and inspiration from existing energy efficiency initiatives

Effect	Examples and inspiration
Messenger We are heavily influenced by who communicates information Includes: • Role of experts • Peer effects • Importance of consistency	• Initial evidence from DECC's current 'pay as you save' pilots suggests that around 50% of customers change their mind about which measures to install in their home following a visit from an expert assessor. • Expert assessments are also a key part of energy efficiency policies in other countries e.g. Queensland 'Get Climate Smart' scheme in Australia includes a household power assessment. • This approach has also been used in the UK e.g. Groundworks "Green Doctors" local advisers
Incentives Our responses to incentives are shaped by predictable mental shortcuts, such as strongly avoiding losses, discounting of future rewards	• Council Tax credits, financed by British Gas, have been used effectively to drive uptake of energy efficiency measures in over 50 local authorities – evidence from these areas shows people love getting a tax discount. • The time limited boiler scrappage scheme was also a great example of effective use of incentives - £400 voucher off installation of a new, A-rated boiler to replace old, inefficient models.
Norms We are strongly influenced by what others do And need consistent reminders of this over time	• There is emerging evidence that area based approaches can drive take up. Community Energy Saving Pilots (CESP) encourage energy suppliers to partner with local authorities to deliver energy efficiency measures within highly targeted deprived areas. Early signs are that this locally based approach is working e.g. a project in Walsall started with a target of around 130 households and has now risen to over 400, driven by neighbors' seeing the work being done and talking to each other. • Similar effects in some Low Carbon Communities Challenge projects e.g. the Meadows in Nottingham, where solar PV installation has got neighbors talking to each other about how to get involved.
Defaults We 'go with the flow' of pre-set options	• The London Sustainability Exchange has a pilot with Notting Hill Housing Group to provide energy efficiency advice 'Sustainability Starter Kits' as part of welcome pack for new Housing Association tenants. • We have also used defaults in the past when developing other energy efficiency policies e.g. for instance to gain access to a Low Carbon Buildings Programme grant for installing

	microgeneration, householders had first to fit basic energy efficiency measures.
Salience Our attention is drawn to what is novel and seems relevant to us	• A Low Carbon Communities Challenge project in Totnes is putting a public digital display on Totnes Civic Hall to show the energy efficiency savings being made by its energy retrofit. • The City of Newcastle in Austrialia has a ClimateCam® Billboard showing hourly updates on actual electricity consumption and a comparison to the City average.
Priming Our acts are often influenced by sub-conscious cues	• There are real time electricity displays which glow or flash or go red if consumption is high. • Insulation prominently displayed in store could help e.g. B+Q have now put all their energy saving products in one area at the front of 63 stores.
Affect Our emotional associations can powerfully shape our actions	• In Devon, the new 'Cosy Devon' branding led to triple the number of enquiries that they would usually expect in the month after they launched their new look. • Kirklees' famous "WarmZone" branding uses a similar approach.
Commitments We seek to be consistent with our public promises, and reciprocate acts	• The well-known 10:10 campaign, a movement which asks individuals, businesses and organisations to sign up publically to cutting their emissions by 10% in 2010. • The Isle of Eigg 5kW challenge also uses commitment: o Hebridean Island, 10 miles off the Scottish west coast, with a fully renewable electricity supply. o In 2008, the 83 islanders pledged to keep their total electricity use within 5kW to manage demand for power. o They use energy meters and information stickers on the key appliances to help them manage consumption. o Their system sets off a trip switch which shuts off power to the household if the limit is exceeded. o To get reconnected involves a call out charge of £20. o There were only 3 call outs there were in the first two years.
Ego We act in ways that make us feel better about ourselves and like to think of ourselves as consistent	• Early evidence from DECC's Pay As You Save pilot suggests that once people have had insulation fitted, they're likely to be motivated to talk to others about it. Indications are that it makes them feel good about themselves in some way, even if it was originally motivated by a desire to save money or make their house warmer.

Annex 4: E Shove: Comfort Cleanliness and Convenience – A Summary

This is a summary of the paper Converging Conventions of Comfort, Cleanliness and Convenience[29] (16 pages) and the book Comfort, Cleanliness and Convenience the Social Organisation of Normality[30] (240 pages) by E.Shove, Lancaster University

This work presents a sociological approach to understanding how people use energy, and other environmental resources. It argues that energy and resources are not consciously used or consumed by people, but that their use is incidental in the process of people undertaking a range of activities that people consider to constitute "normality". Instead of looking at energy use as the consequence of a rational set of choices made by individuals, the work looks at the complex web of social conventions and expectations, and the technologies that interact with these to produce "socio-technical systems".

The work looks at three central examples:

Comfort: In particular the large amount of energy used in space heating and cooling;

Cleanliness: The 70% increase in domestic water consumption over 30 years (1/3 of which is used for bathing, showering and washing clothes – activities which are 5 times more frequent than in 1900);

Convenience: The proliferation of energy hungry devices that save time, or otherwise make life more 'convenient' (e.g. cars, frozen food etc.) but ultimately more energy intensive.

Shove argues that there is a tendency to look at processes of innovation and acquisition rather than at how things are ultimately used – and so there is little evidence of "*how suites of technologies are used together and how they cohere….in shaping the meaning of what it means to be comfortable or to keep oneself and one's clothes appropriately clean*". The interaction of increasing social expectations and the development of new technologies to meet these leads to an ever increasing 'ratcheting' effect on our practices, and consequently on our energy use.

Comfort

Using the example of thermal comfort, she looks at the development of a "science of comfort" that is now enshrined in the ASHRAE and other similar building standards, and which leads to a definition of comfort that can only ever be met through mechanical systems. The universality of these standards then leads to the normalisation of these conditions. Despite differing external climatic conditions, all internal temperatures begin to converge on 22°C and people come to think of this as 'comfortable'. As air-conditioning has become the norm in certain countries, in domestic properties as well as commercial ones, building design has begun to omit features important in naturally ventilated designs, such as verandas, overhanging eaves etc. This then locks people into having to use air-conditioning, and consequently social expectations change (such as the official ban on the siesta in the Mexican government). These expectations fan out across society, for example leading to trends in fashion which further increase dependence on mechanically created climates to create standard conditions, at home, at work and in transit.

Cleanliness

[29] Shove,E. 'Converging Conventions of Comfort, Cleanliness and Convenience', published by the Department of Sociology, Lancaster University, Lancaster LA1 4YN, UK, at http://www.comp.lancs.ac.uk/sociology/papers/Shove-Converging-Conventions.pdf

[30] Shove, E. (2003), Comfort, cleanliness and convenience: the social organization of normality. Oxford: Berg.

In a similar way, Shove looks at changes in our notions of cleanliness, how we have come to see laundry as 'freshening' clothes rather than a way of removing visible dirt, and how washing machines, associated products (fresheners, whiteners, stain removers etc.), and the clothing industry are all deeply intertwined in this process. She then turns to bathing and the escalation from a weekly bath to twice daily showering – again technology and social conventions are found to play a significant role. "*There is more to laundry and bathing that the removal of dirt.*"

Convenience

Finally she turns to the more complex topic of "convenience" and the move from seeing this in terms of 'time-saving' to being "*about storing or shifting time..providing people with greater flexibility or control over their schedule*". As new technologies or infrastructures enable more flexible behaviour (short-haul flights allow people to travel to Scotland for afternoon meetings), more people schedule, and expect people to attend, afternoon meetings in Scotland. So again this leads to a pattern of increased expectations and subsequently dependence on energy intensive technologies.

Thus technology is seen as providing a 'service' that meets an existing social demand, yet at the same time it also creates new sets of convention and expectation that establish a new standard of normality. One that is usually more resource dependent than the previous one. This in turn creates new opportunities for technology to help.

Shove concludes: "From this macro-perspective, the efficiency of one technology or another matters less than the concept of service that each sustains. In effect, the real environmental risk is of a sweeping convergence in what people take to be normal ways of life, and a consequent locking in of unsustainable demand for the resources on which these depend."

What does this mean for policy?

The consequence for policy-making from this analysis is that energy intensive behaviours are not simply a matter of individual choice. The actions of people in their day-to-day lives are woven into a complex set of societal expectations and conventions, and different infrastructures (what are termed socio-technical regimes). History shows us the way people behave can sometimes go through great step-changes (such as the use of mobile phones or the internet in recent times). These changes don't just happen because a technology has been invented, there are patterns of demand and then expectation that surround and accelerate their use.

In order to get people to make changes to their lifestyle, policy-makers need to develop a broader understanding of these patterns, so that they know which levers to pull on to try and effect change. In addition to this, apparently simple changes in behaviour will rarely be isolated and may link to a range of other aspects of the person's life. Some of these might inadvertently lead to increase in energy use (rebound) others might be perceived as leading to the person being deprived of something they value – leading to reluctance or ill-will with respect to the new behaviour. By trying to predict and soften some of the inadvertent impacts, policy-makers can make their endeavours more legitimate.

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