Interventions in practice: re-framing policy approaches to consumer behaviour

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Executive Summary

A Practice Perspective for Sustainability Policy Interventions

This report introduces a novel approach to sustainability policy— a practice perspective. We argue that social practices are a better target of intervention for sustainability policy than 'behaviour', 'choice' or technical innovation alone. Understanding the dynamics of practices offers us a window into transitions towards sustainability.

We consume resources as part of the practices that make up everyday life—showering, doing the laundry, cooking or driving—what we might call *inconspicuous* or *ordinary* consumption. While we may have degrees of choice in how we perform these practices, access to resources (economic, social, cultural), norms of social interaction, as well as infrastructures and institutional organisation constrain our autonomy. Practices are social phenomena—their performance entails the reproduction of cultural meanings, socially learnt skills and common tools, technologies and products. This shift of perspective places practices, not individuals or infrastructures, at the centre stage of analysis. Taking practices as the unit of analysis moves policy beyond false alternatives—beyond individual *or* social, behaviour *or* infrastructure. A practice perspective re-frames the question from "How do we change individuals' behaviours to be more sustainable?" to "How do we shift everyday practices to be more sustainable?" After all, 'behaviours' are largely individuals' performances of *social* practices.

Problem Framings

The table below sets out six different ways in which the sustainability challenge is and may be framed. Each problem framing has its own logic, suggesting plausible and possible targets for intervention, and excluding other options. This table can be used as a simple tool to identify problem framings in existing policy.

The first three problem framings are common-place within current policy: (1) Innovating Technology (2) Shifting Consumer Choices and, more broadly, (3) Changing Behaviour. These framings co-exist across different policy sectors. Problem framings 4-6 are based on our practice perspective and draw on ideas that will be unfamiliar to most readers. This perspective takes *social practices*—what people do, and how this is coordinated and organised—as the starting point for analysis. Policy informed by a practice perspective would take social practices as sites of intervention.

Table 1: Six different ways in which the sustainability challenge is framed.

Problem framing of the sustainability challenge	**Target of intervention**
Common framings in current policy interventions	
1. Innovating Technology	Reduce the resource intensity of existing patterns of consumption through technical innovation.
2. Shifting Consumer Choices	Encourage consumers to choose more sustainable options.
3. Changing Behaviour	More broadly, encourage individuals to adopt more sustainable behaviours and discourage them from less sustainable behaviours.
Framings drawing on a practice perspective	
4. Re-crafting Practices	Reduce the resource-intensity of existing practices through changing the components, or elements, which make up those practices. (Practice elements are introduced below.)
5. Substituting Practices	Replace less sustainable practices with more sustainable alternatives. How can new or alternative practices fulfil similar purposes?
6. Changing how Practices Interlock	Social practices interlock with each other—for example: mobility, shopping and eating. How can we harness the complex interactions *between* practices, so that change ripples through interconnected practices?

Our objective is, firstly, to make current, common problem framings explicit, and to demonstrate their limitations in light of an understanding of social practices. And secondly—the central objective of the report— is to explain this practice perspective, and why it is useful to sustainability policy. These objectives are intended to help policy makers question their assumptions and consider alternative options for analysis and intervention.

In the body of the report we offer three case studies—of a review (the *King Review* for decarbonising road transport), a vision (*Food 2030*) and a code (the *Code for Sustainable Homes)*. Through these case studies we illustrate the role problem framings 1-3 play and explore how a practice perspective offers different targets for intervention in the same policy realm. Existing policy

may involve some of the kinds of intervention suggested in problem framings 4-6, but does not yet exploit the potential of a systematic application of a practice perspective. The table below illustrates the weighting of the six problem framings across the cases. The darker shade represents heavier weighting—note that a practice perspective, to a limited degree, is represented in all three of the cases (whilst not explicitly acknowledged).

Table 2: Weighting of the six problem framings across the case studies.

	King Review	Food 2030	Code for Sustainable Homes
Innovating technology			
Shifting consumer choices			
Changing behaviour			
Re-crafting practices			
Substituting practices			
Changing how practices interlock			

In the rest of this Executive Summary we briefly outline the three problem framings that are commonplace within policy and introduce problem framings 4-6. Throughout this report we use numerous examples, often speculative, to illustrate the dynamics of social practice. While the case studies in the report were selected on the basis of representing resource intensive domains—mobility, food and the built environment—this report does not make concrete recommendations for specific sustainability policies in these areas. Rather it has the goal of illustrating the application of a practice perspective to social change. Examples are used therefore for their utility in illustrating the dynamics of social practice—we make no claims that these examples represent more sustainable practices. Such claims can only be supported through empirical research about practices.

Common Framings in Current Sustainability Policy

Innovating Technology for Sustainability: Problem Framing 1

Debate has often focused on de-coupling economic growth from rising levels of material consumption (e.g. Jackson, 2009). The model of change is one of technological innovation—decarbonising road transport, building energy efficient houses, or producing energy efficient white goods—in which our behaviour is largely unchanged. It is a vision of our current way of life made sustainable through technical developments.

All too often the Innovating Technology framing extrapolates from existing patterns of everyday life and offers technical solutions to *that* imagined future, rather than imagining the future differently. We would argue from a practice perspective this misconstrues the relation between technological and social change. The framing often advocates radical technical change whilst assuming this change

will occur in the context of relative social stasis, rather than technological and social change being interwoven through social practices. This idea is explored further in the Introduction of the Report.

Shifting Consumer Choice and Changing Behaviour: Problem Framings 2 and 3

Since the late 1990s, it has been increasingly recognised that the Innovating Technology approach alone will not achieve the speed, scale and depth of transitions required (Anderson and Bows, 2011). Sustainability, it has been increasingly realised, will not be achieved through supply-side innovation alone. There has been a growing focus on the demand side of sustainable consumption (e.g. Sustainable Development Commission, 2006) and the potential of intervening in consumer choices and individuals' behaviour (Dolan et al., 2010).

These problem framings focus on reducing the resource-intensity of consumption through encouraging consumers to make more sustainable choices and, more broadly, for individuals to adopt more sustainable behaviours (see Southerton et al, 2004 for a more detailed discussion). There are three overlapping ideas which inform the models of change in these closely related problem framings, and the kinds of interventions they propose.

The first is that consumers make rational decisions based on price and information about a product's qualities. Interventions might focus on pricing of products and providing information, such as labelling schemes. Commonly the consumer choice problem framing sees the aggregate 'demand' resulting from individual choices in simplistic terms as the *cause* of change.

The second is that individuals' behaviour and choices are primarily an outcome of attitudes and values. In this model therefore behaviour change is best approached by changing attitudes and values (for a critique, see Shove, 2010). Interventions that reflect this model include providing information in the form of social marketing (Andreasen, 1995; McKenzie-Mohr, 2000). This throws up the problem of the 'value-action gap': the observation that some people's pro-environmental values and attitudes are not matched by their behaviours.

Both framings often exaggerate the autonomy of individual choice. In response to this, but still within the ambit of the two framings, the third idea is that the value-action gap exists because of 'unconscious' *habits* which complicate rational decisions and the relationship between values and actions (Hobson, 2003). Thaler and Sunstein (2008) suggest that interventions can 'nudge' habits in particular directions (for example, by switching organ donation schemes from automatically being opted out to in).

The authors of this report also recognise the value-action gap, but think there are other ways of explaining it than individual inertia, or the effect of the context of individual choices. Our approach focuses on the social practices through which resources are collectively consumed, and on how these social practices might become targets for intervention.

Introducing a Practice Perspective

In essence we promote the idea that individual behaviours are, primarily, performances of social practices. This is illustrated in the figure below. Rather than being the expression of an individual's values and attitudes, behaviour is the observable expression of social phenomenon (socially shared tastes and meanings, knowledge and skills, and materials and infrastructure). As such 'behaviour' is just the tip of the iceberg (see Figure 1 below), and the effects of intervening in behaviour are limited accordingly. It is the practice entity—the socially embedded underpinning of behaviour—which we argue forms a better target for sustainability policy.

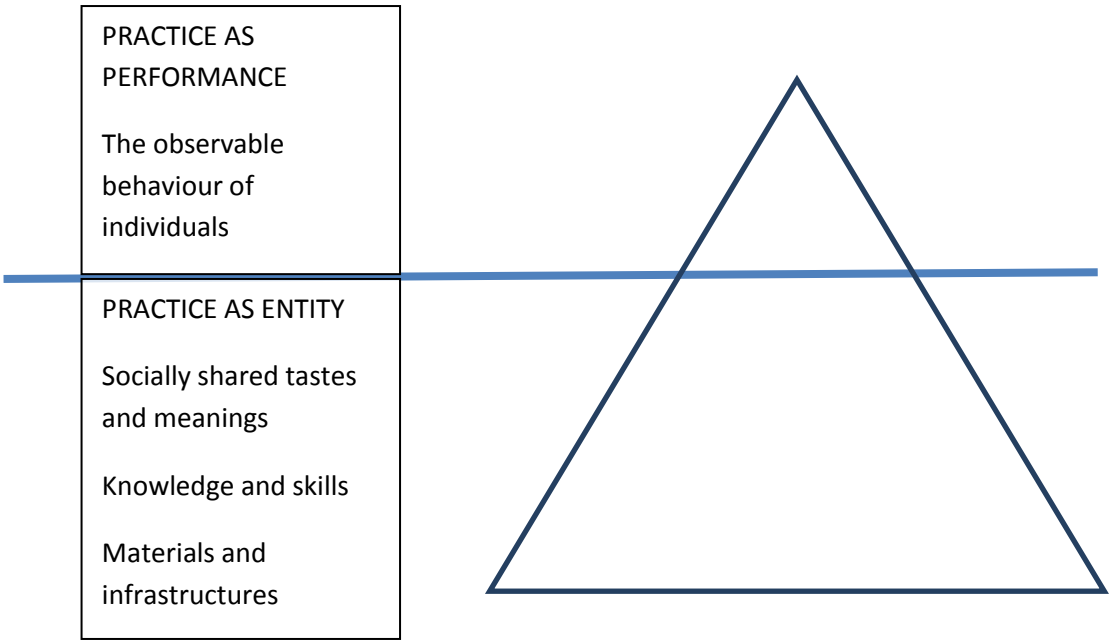


Figure 1: Observable behaviour is just the tip of the iceberg.

Take for example vegetarianism: 5% of UK adults report being vegetarian or vegan (Office of National Statistics, 2002). However, the fact that the other 95% of UK adults do eat meat is not simply an isolated matter of individual discretion. Most people in the UK have a shared understanding, or cultural convention, that a 'proper meal' contains meat, vegetables and carbohydrates (Mitchell, 1999). Furthermore, different social groups, such as age cohorts and socio-economic groups, predictably favour particular variations of the 'proper meal' (Bennett et al., 2009). These understandings have a social history, which involves the organisation of the food system, domestic technologies, cultural representations and indeed previous policy interventions.

Imagine a hypothetical policy intervention to reduce the frequency with which meat is included in meals. Problem framings 2 and 3 would suggest encouraging individuals to *choose* to eat less meat, and intervene in values and attitudes around health and sustainability to do so. But what about routine, convention, and the everyday constraints of resources, infrastructures and institutions? What happens when such individuals are a guest to dinner, at a restaurant or catered lunch, or in the army? Encouraging individuals to choose to eat less meat is just the tip of the iceberg.

Elements of Practice

Social practices are made of different elements. Shove et al (2012: 23) suggest there are three types of element: material, competence and meaning. These are represented by the 3 coloured circles in Figure 2. Each time a practice is performed these different elements are brought together, and it is not possible to perform a practice unless all the requisite elements are available.

Figure 2: The elements of practice

Social practices are made of three types of element: material, competence and meaning (Shove et al., 2012: 23).

materials	Objects, tools, infrastructures
competence	Knowledge and embodied skills
meanings	Cultural conventions, expectations and socially shared meanings

What elements, for example, compose the practice of hosting a dinner party? Firstly, the material components are required: food and drink, obviously, and cutlery, crockery, tables and chairs. As well as these objects and tools we require the domestic infrastructure of the home, most evidently the kitchen, which is shared with many other practices, and the wider infrastructures of energy and water supply on which this in turn depends. What competences are required? Clearly competence in cooking is required, but also, to successfully perform the practice, knowledge of dinner party etiquette. We might achieve distinction in our performance of the practice through specialised knowledge of wine, or perhaps of music. Thus this competence in turns rests upon cultural conventions and expectations. The relative informality of many contemporary dinner parties in the UK, for example, is no less a cultural convention than the complex formality of dinner party etiquette amongst certain social groups and settings.

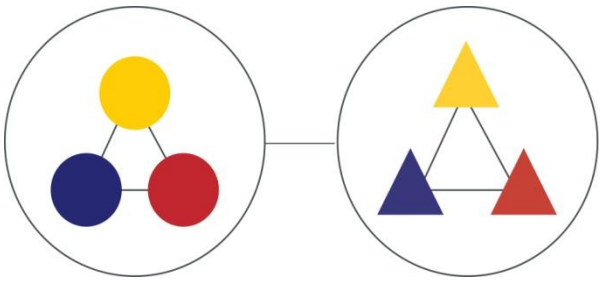
Socially acceptable individual behaviour—or the successful performance of a social practice—thus rests upon the use of objects, tools and infrastructures, of knowledge and skills and of cultural conventions, expectations, and socially shared tastes and meanings. These are the elements that compose social practices.

Re-crafting Practices: Problem Framing 4

Our initial practice problem framing seeks to change the elements of existing practices —the materials, competences and meanings that compose them (Shove et al., 2012: 147). Re-crafting Practices is not dissimilar to some current intervention strategies such as the introduction of industry standards for products (which address material elements), or forms of training, such as cookery skills classes, or social marketing and information campaigns, (which commonly address

competences and meanings respectively). As such it is close to certain existing forms of behaviour change intervention. However, the Re-crafting Practices framing suggests systematically analysing and intervening in the component elements of practice to make existing practices more sustainable; whether through taking account of all types of practice elements or recognising their specific relationships.

Figure 3: Re-crafting practices[1]



Reduce the resource intensity of existing practices through changing the elements that make up those practices.

An Example of Re-crafting Practice: The New Nordic Diet

The New Nordic Diet is an integrated policy programme that demonstrates Re-crafting Practices, although it is not explicitly framed as such. The programme was developed out of a five year multi-disciplinary research project focused on the promotion of a novel healthy and sustainable cuisine. The programme aimed to develop a healthy, environmentally sustainable diet based on foods originating from the Nordic region (Mithril et al., 2012). The programme enrolled multiple actors, including fashionable restaurants and chefs, high-profile political supporters, legitimating scientists, disseminating media, and actively interpreting audiences, enabling rapid diffusion (Byrkjeflot et al., 2013). It addressed multiple elements of practice simultaneously. Firstly, the material element: food. But also competence (offering cookery courses) and meanings (it was conceived as an identity movement), and actively sought to recruit practitioners to this novel culinary variant through organized dissemination and the enrolling and support of innovative initiatives.

[1] Figures 3-5 adapted from Shove et al. (2012).

Substituting Practices: Problem Framing 5

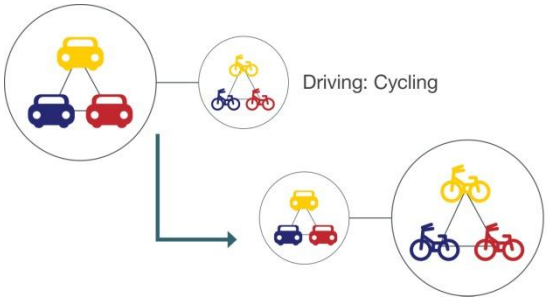
Substituting Practices suggests that policy might focus on discouraging current unsustainable practices and substituting them with existing or new alternatives. This framing moves us beyond thinking about the future by extrapolating from existing practices (e.g. personal mobility is heavily car-based therefore a more sustainable transport system will make driving more sustainable) to thinking about how more sustainable practices (new or old) can fulfil the same needs and wants.

There are two ways in which this might be achieved:

i. Competition between practices for time, space and resources
For a practice to exist, it requires spaces where its performance can take place. An example can be found in new-build flats in the UK which often have no bath, simply a shower-room, 'locking-in' trends towards showering (Hand et al., 2005). Practices also require people's time to perform them. Importantly for policy makers, some practices directly compete for performers because they meet the same needs when performed. Commuter cycling and commuter driving compete for many of the same resources, including practitioners' time, finite space on roads, and spending on infrastructure (see Watson, 2012). We examine this example further in Case Study 1 in the main report (see page 25).

ii. Encourage more sustainable variants of a practice
Practices have a range of variants, some more mainstream than others. For example, having a meal might involve cooking a vegan meal from scratch, buying a ready meal, or a take-away or eating at a fine dining restaurant. In Case Study 2 (see page 33) we examine how variants have particular trajectories: for example, eating out is on the increase and meat-free meals are becoming more mainstream. Such existing trends—which can be revealed by social science research— might be harnessed by policymakers to encourage more sustainable trajectories. In Case Study 3 (see page 40) we examine how material infrastructure can encourage more sustainable variants: such as homes with dedicated space for air-drying laundry, but not for tumble dryers. This approach, in some senses, can be seen as a more radical version of re-crafting practices.

Figure 4: Substituting practices



Replace less sustainable practices with more sustainable alternatives.

An Example of Substituting Practices: Greater Manchester's Cycling Hub scheme

A behaviour change programme encouraging cycling might offer an environmental information campaign, subsidised bikes, cycling skills workshops and public bike storage. A practice based analysis of the same task might recognise that *commuter* cycling is a particular variant of practice comprised of different elements to leisure cycling, or mountain biking. If cycling is to compete for commuters then it is this variant that should be the focus of policy.

An example of a policy intervention aimed at substituting cycling for other forms of commuting is Transport for Greater Manchester's Cycling Hub scheme (http://cycling.tfgm.com/). The city centre Cycling Hub is located conveniently for transfer to rail, tram and bus services and offers commuters dedicated cycle parking spaces, lockers and showers (recognising that an element of commuter cycling is the cultural expectation of cleanliness at work). The Hub also contains a bike shop offering on-site maintenance and servicing, recognising that reliability is an important aspect of commuter cycling, and skills training for this specific variant of the practice, for example providing confidence in urban traffic. Each of these elements encourages new recruits to commuter cycling and defection from driving.

Changing how Practices Interlock: Problem Framing 6

A third way of thinking through a practice perspective is to identify how practices interlock with one another[2]. Infrastructure – which influences *where* activities take place, and institutions – which influence *when* activities take place, play a vital part in how practices interlock, and are therefore important targets for interventions in this problem framing. Practices interlock in two ways:

i. Sequences of practices
Our daily schedules are in-part determined by institutions and organisations: such as school timetables, the working day, and shop opening hours. Such sequences have differing implications for sustainability. For example, as they have co-evolved alongside the driving of private cars, many of these sequences have become dependent on the car. In Case Study 1 (see page 26) we discuss how focussing on sequences of interlinked practices forms an alternative approach to intervening in unsustainable forms of mobility.

ii. Synchronisation of practices
Peak energy loads caused by millions putting the kettle on in the same TV advert break and the morning rush hour are both caused by the synchronised performance of practices (Shove et al., 2009). We know from social and historical research that changes in the temporal patterns of eating (e.g. to three meals a day) accompany shifts in the institutional arrangements of family life, households, and working hours (Southerton, 2009). Certain forms of synchronisation may be more or less unsustainable. In Case Study 2 (see page 33) we speculate about how the synchronisation of practices might be changed.

[2] For a discussion of the connections between practices, see Chapter 5 in Shove E, Pantzar M and Watson M. (2012) *The Dynamics of Social Practice: Everyday life and how it changes.* London: Sage.

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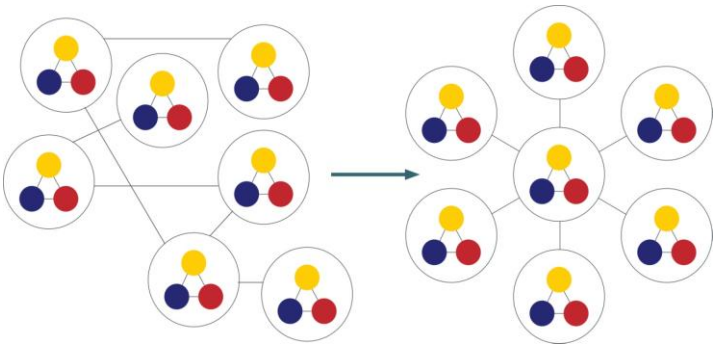


Harness the complex interactions *between* practices, so that change ripples through interconnected practices

Figure 5: Changing how practices interlock

An Example of Changing how Practices Interlock: Liverpool Central Library

Though not explicitly designed to change locations of work, the refurbished Liverpool Central Library is a new kind of city centre space, which speculatively, might bring about this kind of change (http://www.liverpool.gov.uk/libraries/find-a-library/central-library). The inclusion within the design of large amounts of desk space, electric points, pc, internet and print facilities, different forms of workspace (meeting rooms, games areas, reading rooms, lounge areas) means that the library potentially provides a place for people to work locally (which might reduce weekly commutes). That is, for new practices of working to develop.

The library (possibly inadvertently) brings to life the idea of 'community hubs' in which people can work 'from home' in the same venue (see the King's Cross Hub for an example https://kingscross.the-hub.net/). Such hubs not only address some of the social and practical challenges of working from home, such as isolation, or the absence of suitable resources. They also allay concerns about the questionable sustainability benefits of shifting workers from shared offices to individual homes, which could off-set the potential benefits of reduced mobility by increasing overall energy consumption.

The point here is that new kinds of space, like the Library, could potentially enable interlocking practices of working, commuting, eating and socialising to be radically reconfigured.

Conclusion

The three practice perspective problem framings, Re-crafting Practices, Substituting Practices and Changing how Practices Interlock provide a tool to analyse the challenge of sustainability in new ways. The framings provide a means of abstracting from the complexity of everyday life, and of identifying targets for policy intervention.

Identifying problem framings and the underpinning assumptions of intervention reveals how policy reinforces what is 'normal' in everyday life; this can limit the potential for change and unwittingly encourage or lock-in unsustainable practices. Social change is about the *new* becoming *normal*—smoke free pubs, wearing seatbelts, putting out the recycling. A practice perspective encourages us to imagine what the 'new normal' of everyday sustainability might look like—and suggests possible trajectories towards it.

A practice perspective suggests modesty on the part of policy as regards influencing social change—acknowledging we have less control over the social environment in which change takes place than we might wish. However, accepting the complexity of transitions towards sustainability does not mean accepting only minor, incremental change is possible.

A practice perspective shows that social change happens all the time. We only need to look across the past few decades to note the extent to which patterns of work, travel and communication have changed in a relatively short amount of time. That this change in social practice is continually taking place suggests optimism about the scale of change that can be achieved. This in no way means assuming positive change will happen—it means guiding the direction of such change, and being sensitive to the inadvertent effects of policy which might lock-in or even encourage resource-intensive ways of life.

Key messages

The report has four key messages:

- Problem framings have implications for what are viewed as plausible and possible targets of intervention. Understanding the logic of problem framings, and being able to identify them, enables policy makers to see clearly how they constrain or enable options.
- Policy interventions seeking to promote sustainable consumption should be re-framed from a practice perspective: that is, they should take practices as the units of intervention. This contrasts with intervening in behaviour, consumer choice, or technology alone.
- Practices are always changing, whether or not there are deliberate interventions designed to steer them in one direction or another. Since such 'trajectories of practice' already exist it makes sense to ask how they might be guided in more sustainable directions. This is a different approach to that of designing one-off interventions to promote more sustainable behaviour and suggests the need for different kinds of evidence.
- Changing how sets of practices interlock is a powerful form of intervention offered by a practice perspective. This report foregrounds the point that sets of practices are held in place by spatial arrangements within the infrastructure and through the temporal rhythms and routines of institutions. Intervening in sets of interlocking practices therefore requires intervening in the institutions and infrastructures that hold such arrangements in place.

Interventions in practice: re-framing policy approaches to consumer behaviour

1. Introduction

1.1 Three common framings of the sustainability challenge

How do we achieve the transition to sustainability? That is the grand challenge of our time. This report provides a framework to help policy makers think through this question systematically—to identify gaps and missed opportunities in current policy and address future initiatives from a comprehensive perspective.

The report provides a simple tool to identify six different ways in which the sustainability challenge is framed—three problem framings (1-3) are commonly found in current policy and three are less familiar (4-6). Our objective is to make current problem framings explicit. These problem framings co-exist across different policy sectors.

Table 3: Six different ways in which the sustainability challenge is framed.

Problem framing of the sustainability challenge	Target of intervention
Common framings in current policy interventions	
1. Innovating technology	Reduce the resource intensity of existing patterns of consumption through technical innovation.
2. Shifting consumer choices	Encourage consumers to choose more sustainable options.
3. Changing behaviour	More broadly, encourage individuals to adopt more sustainable behaviours and discourage them from less sustainable behaviours.
Framings drawing on the practice perspective	
4. Re-crafting practices	Reduce the resource-intensity of existing practices through changing the components, or elements, which make up those practices.
5. Substituting practices	Replace less sustainable with more sustainable practices. How can new or alternative practices meet the same needs and wants?
6. Changing how practices interlock	Social practices interlock with each other—for example: mobility, shopping and eating. How can we harness the complex interactions *between* practices, so that change ripples through interconnected practices?

Each problem framing has its own logic, suggesting particular types of intervention, and excluding other options. We briefly outline the three problem framings that are common-place within policy — (1) innovating technology, (2) shifting consumer choices and (3) changing behaviour —and their limitations. We then introduce a practice perspective and problem framings 4-6. These framings take *social practices*—what people do, and how this is coordinated and organised—as the starting point for analysis. Existing policy may involve some of the kinds of intervention suggested in problem framings 4-6, but does not yet exploit the potential of a systematic application of a practice perspective. Explaining this perspective, and why it is useful to sustainability policy, is the central objective of this report.

In Sections 2-4 we offer three case studies—the King Review for decarbonising road transport, Food 2030 and the Code for Sustainable Homes— each of which identifies changing consumer behaviour as central to the challenge of fostering more sustainable ways of life. Through these case studies we illustrate problem framings 1-3 and explore how a practice perspective offers different targets for intervention.

1.1.1 Problem framing 1: Innovating technology for sustainability

Debate has often focused on de-coupling economic growth from rising levels of material consumption (e.g. Jackson, 2009). The model of change is one of technological innovation — decarbonising road transport, building energy efficient houses, or producing energy efficient white goods—in which our behaviour is largely unchanged. It is a vision of our current way of life made sustainable through technical developments.

Since the late 1990s, however, it has been increasingly recognised that such an approach alone will not achieve the speed, scale and depth of transitions required (Anderson and Bows, 2011). Sustainability, it has been increasingly realised, will not be achieved through supply-side innovation alone. There has been a growing focus on the demand side of sustainable consumption (e.g. Sustainable Development Commission, 2006) and the potential of intervening in consumer choices and individuals' behaviour (Dolan et al., 2010).

1.1.2 Problem framings 2 and 3: Consumer choice and behaviour change

These problem framings focus on reducing the resource-intensity of consumption through encouraging consumers to make more sustainable choices and for individuals to adopt more sustainable behaviours (see Southerton et al, 2004 for a more detailed discussion). There are three overlapping ideas which inform the models of change in these problem framings, and the kinds of interventions they propose.

The first is that consumers make rational decisions based on price and information about a product's qualities. Interventions might focus on pricing of products and providing information, such as labelling schemes.

The second is that individuals' behaviour and choices are primarily an outcome of attitudes and values. In this model therefore behaviour change is best approached by changing attitudes and values (for a critique, see Shove, 2010). Interventions that reflect this model include providing information and forms of social learning and social marketing (Andreasen, 1995; McKenzie-Mohr,

2000). This throws up the problem of the 'value-action gap': the observation that people's pro-environmental attitudes are not matched by their behaviours.

The third idea is that the value-action gap exists because of habits. Habits are 'unconscious' and 'responsive' behaviours, which complicate rational decisions and the relationship between values and actions (Hobson, 2003). Thaler and Sunstein (2008) suggest that interventions can hook into these 'automatic mental processes' to overcome inertia and 'nudge' habits in particular directions (for example, by switching organ donation schemes from automatically being opted out to in).

Though such strategies may be effective in specific cases, their capacity to tackle the large scale behavioural change required to meet the sustainability challenge has been widely questioned (House of Lords Science and Technology Select Committee, 2011; Warde, 2011).

1.2 The limitations of problem framings 1-3

1.2.1 Beyond the value-action gap

The authors of this report also recognise the value-action gap, but think there are other ways of explaining it than individual inertia or an effect of the context of individual choices: explanations that are of more use to policy makers.

Behaviours are not simply the observable expression of an *individual's* values and attitudes. Rather they are the observable expression of *social* phenomena —such as cultural conventions, shared understandings, learned competence, and access to resources. An obvious objection here might be that individuals clearly *do* make choices about their behaviour based on values and attitudes. Take for example vegetarianism: 5% of UK adults report being vegetarian or vegan (Office of National Statistics, 2002). However, the fact that the other 95% of UK adults do eat meat is not simply an isolated matter of individual discretion. Most people in the UK have a shared understanding that a 'proper meal' contains meat, vegetables and carbohydrates (Mitchell, 1999). Furthermore, different social groups, such as age cohorts and socio-economic groups, predictably favour particular variations of the 'proper meal' (Bennett et al., 2009). These understandings have a social history, which involves the organisation of the food system, domestic technologies, cultural representations and indeed previous policy interventions.

Imagine a hypothetical policy intervention to reduce the frequency with which meat is included in meals. Problem framings 2 and 3 would suggest encouraging individuals to *choose* to eat less meat, and intervene in values and attitudes around health and sustainability to do so. But what about routine, convention, and the everyday constraints of resources, infrastructures and institutions? What happens when such individuals are a guest to dinner, at a restaurant or catered lunch, or in the army? Encouraging individuals to choose to eat less meat is just the tip of the iceberg.

We ask: is the *deliberate* exercise of choice, informed by values and attitudes, a useful general description of how we go about our everyday lives? Or is this rather a very specific form of behaviour which limits scope for wider analysis?

1.2.2 Beyond techno-fixes

The innovating technology problem framing seeks to reduce the resource intensity of existing patterns of consumption through technical innovation. This is to assume that in a sustainable future behaviour will stay the same, but be made sustainable purely through technology. We suggest that this approach is based on flawed logic. We only need to look back a few decades to see that everyday practices are constantly changing – sometimes in relation to technological change and sometimes not. The use and meanings of technologies co-evolve with everyday life. Think for example how the use and value of the humble freezer has shifted from being a device to 'beat the seasons' in the late 1960s to a bulk storage facility in the early 1980s and a much smaller convenience device of the 1990s. The point is that new technologies result in modified or new practices, and so the impact of new technologies on existing patterns of consumption is unpredictable.

The co-evolution of the freezer and practices of cooking/eating

The social history of the freezer illustrates how technologies do not exist in a vacuum. Rather, products such as freezers co-evolve with everyday practices of shopping, cooking and eating. The role of the freezer is influenced by social changes, such as the growth of supermarkets, car ownership and an increasing proportion of women entering the work-force (which changes how, when and by whom household chores are done).

Forty years ago only 3% of the UK population owned a freezer – by the end of the twentieth century more than 96% of UK households had one or more. The freezer was first marketed to store seasonal gluts of home produce. But it enabled a frozen food industry to develop, which began to change the way we shopped, cooked and ate. In the '70s and '80s the freezer moved from the garage to the kitchen (and is now part of the 'fitted kitchen'), and over the last twenty years the dimensions of fridge-freezers have grown to accommodate ready meals and convenience foods (Shove and Southerton, 2000).

Even though freezers help people cope with busy, harried lives, they lock their users into certain practices, habits and infrastructure (Shove and Southerton, 2000), such as weekly or fortnightly trips to the supermarket to 'stock up'. If the freezer is 'necessary', it is not because it is necessary to have frozen food. But because it has become increasingly important as a device to manage the everyday demands of working lives, family life and making meals—in ways that only freezers allow (Shove and Southerton, 2000).

Whether freezers make shopping, cooking and eating practices more or less sustainable is an empirical question. The point of this example is to illustrate that technologies and everyday practices are intimately interwoven. If we are serious about sustainable consumption we need much more than new or better technologies. We need to unstitch a whole set of relations between technologies and what people do in everyday life and stitch them back together into a pattern that supports sustainability.

1.2.3 Beyond existing problem framings

To understand how to achieve change through policy interventions we have to understand how change happens. The explanations offered above view change as driven by the discretionary behaviour of individuals and/or through technological innovation[3]. We propose that taking *social practices*—such as commuting, eating, cooking, laundering— as the unit of analysis provides us with a better way to look at change.

1.3 A practice perspective: three alternative framings of the sustainability challenge

"Consumption is not itself a practice, but is rather a moment in almost every practice" (Warde, 2005: 137). People consume resources as they engage in socially-recognisable activities. These activities might contribute to accomplishing standards of comfort and cleanliness (Shove, 2003) such as bathing, showering, or laundering. They might be linked to leisure or exercise, for example running, computer gaming, playing football or skiing. Or could play a part in making these other things possible, such as driving or cycling. All the activities referred to above might be thought of as practices. Practices are important for sustainability because we consume resources as part of the practices that make up everyday life—showering, doing the laundry, cooking or driving—what we might call *inconspicuous* or *ordinary* consumption (Shove and Warde, 2002; Gronow and Warde, 2001). Whilst there are practices in which people understand their behaviour as 'consuming'—such as shopping—these are the exception. Whether electricity, gas, petrol or water, resources are not consumed for their own sake, but rather to enable people to take part in practices that are required to live a normal, comfortable and both socially and personally acceptable way of life.

A practice perspective looks at how specific practices are patterned and inter-connected, how they vary and change, how they become dominant or die out[4]. It is not novel to call for models which reflect the complexity of factors influencing pro-environmental behaviour (e.g. Darnton, 2004). What is novel about a practice perspective is that it moves beyond individual behaviour on the one hand and its context on the other —whether material infrastructure or social norms—to a unit of analysis that integrates both behaviours and their material, social and cultural contexts.[5]

[3] For a review of policy interventions that seek to stimulate change by focusing on the individual, societal or material (technological) contexts in which behaviour change is understood see Southerton D, McMeekin A and Evans D. (2011) International Review of Behaviour Change Inititiatives.

[4] The Sustainable Practices Research Group (co-funded by the ESRC, DEFRA and the Scottish Government) directly addresses these research questions (see: www.sprg.ac.uk).

[5] See the 'ISM User Guide' for a practical outline of individual, social/cultural and material contexts of behavior Southerton D, McMeekin A and Evans D. (2011) International Review of Behaviour Change Inititiatives.

1.3.1 Elements of Practice

Practices, such as driving, involve the integration of a complex array of elements for their performance—materials (cars, transport infrastructure), competences, skills and know-how (learning to drive, reading road signs) and meanings that are socially shared (whether the car as status symbol or wearing seatbelts as civic responsibility).

Social practices are made of different elements. Shove et al (2012: 23) suggest there are three types of element: material, competence and meaning.

materials	Objects, tools, infrastructures
competence	Knowledge and embodied skills
meanings	Cultural conventions, expectations and socially shared meanings

Figure 6: The elements of practice

What elements, for example, compose the practice of hosting a dinner party? Firstly, the material components are required: food and drink, obviously, and cutlery, crockery, tables and chairs. As well as these objects and tools we require the domestic infrastructure of the home, most evidently the kitchen, which is shared with many other practices, and the wider infrastructures of energy and water supply on which this in turn depends. What competences are required? Clearly competence in cooking is required, but also, to successfully perform the practice, knowledge of dinner party etiquette. We might achieve distinction in our performance of the practice through specialised knowledge of wine, or perhaps of music. Thus this competence in turns rests upon cultural conventions and expectations. The relative informality of many contemporary dinner parties in the UK, for example, is no less a cultural convention than the complex formality of dinner party etiquette amongst certain social groups and settings.

Socially acceptable individual behaviour—or the successful performance of a social practice—thus rests upon the use of objects, tools and infrastructures, as well as the deployment of knowledge and skills, which in turn rest upon cultural conventions and expectations, and socially shared tastes and meanings. These are the elements that compose social practices.

1.3.2 Practice-as-entity and practice-as-performance

Practices are recognizable to many members of society whether or not they perform the activity themselves. For example, most people can describe driving, or a dinner party, and the elements of which it is composed, whether or not they do these things themselves. Because of this existence of practices beyond particular individuals it is possible to talk about practices as entities. It is useful to draw an analytical distinction between practice-as-entity and practice-as-performance.

Practices-as-entities have a history, i.e. a trajectory, or path of development. Think of the development of cycling to work from 1940s Britain—where it was a commonplace working class activity—to today, with its connotations of sport, health and sustainability, and proliferation of clothing, helmets, and types of bike.

Practices-as-performances are the observable actions of individuals often referred to as 'behaviours' (e.g. washing clothes on a hot wash). However, understanding practices as 'entities' reveals that rather than being the result of individual choice, such actions are social (e.g. there are socially shared ideas of hygiene and cleanliness, washing machines with hot wash settings). As a result changing these seemingly 'individual actions' (performances) requires understanding and intervening in the practice entity.

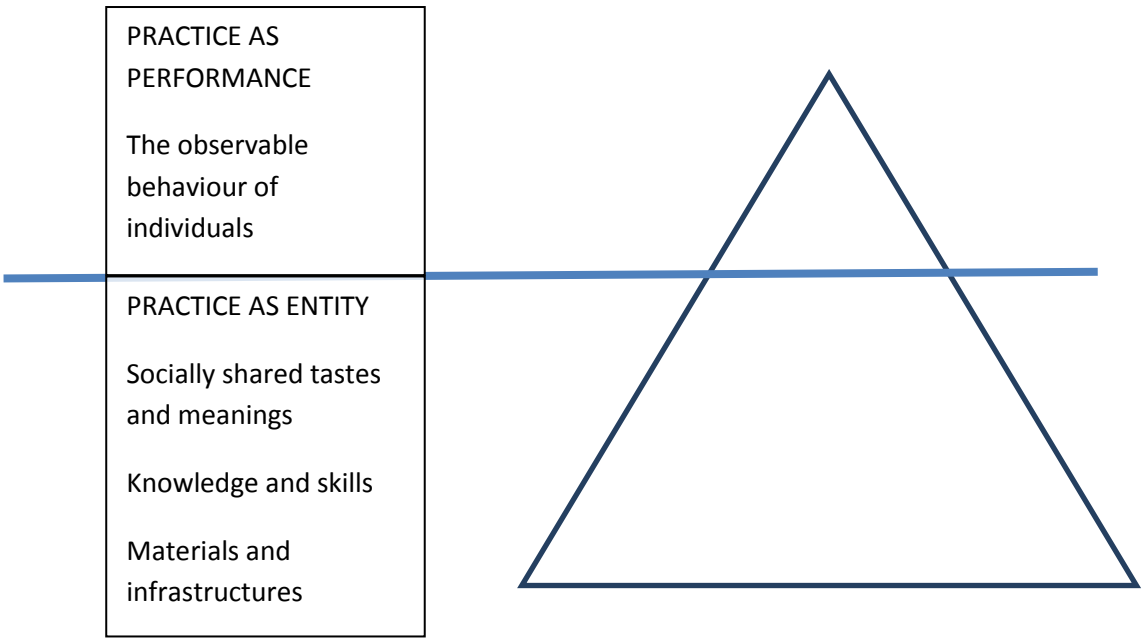
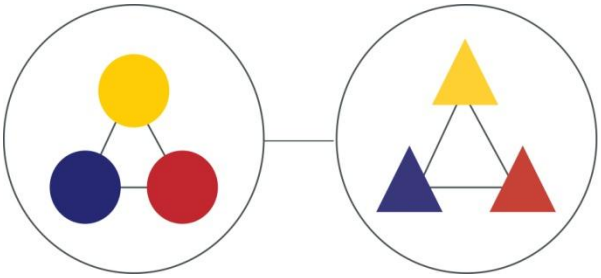


Figure 7: Observable behaviour is just the tip of the iceberg: the performance of socially shared practices. It is the practice entity—the socially embedded underpinning of behaviour—which we argue forms a better target for sustainability policy.

Taking a practice perspective to sustainability policy suggests three novel problem framings:

1.3.3 Re-crafting practices

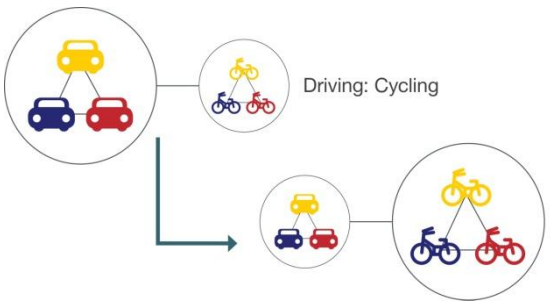


Reduce the resource intensity of existing practices through changing the elements that make up those practices.

Figure 8: Re-crafting practices

This framing seeks to reduce the resource-intensity of existing practices through changing the elements that make up those practices (Shove et al., 2012: 147). Re-crafting practices is not dissimilar to current intervention strategies such as information campaigns, other forms of education (driving tests, cookery skills classes), or the introduction of industry standards for products. However, it suggests a more systematic approach to interventions. For example, how might materials, skills and cultural conventions all be introduced alongside one another to encourage new, more sustainable forms of performance? Or, which existing elements might be removed, so that particular, more sustainable, performances become easier to enact than others? Identifying how elements are combined in less resource intensive performances and then focusing intervention on shifting the range of elements in this direction, or phasing out the elements of more unsustainable versions are another opportunity for policy.

1.3.4 Substituting practices



Replace less sustainable practices with more sustainable alternatives.

Figure 9: Substituting practices

Policy might focus on discouraging current unsustainable practices and substituting them with existing or new alternatives. There are two ways in which this might be achieved:

(a) Competition between practices for time, space and resources

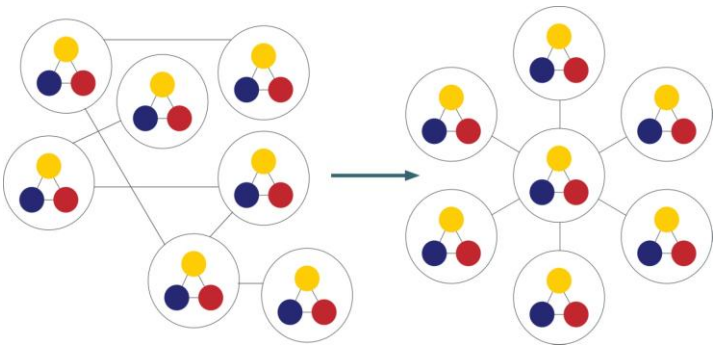
For a practice to exist, it requires spaces and places where performances can take place. For example taking a bath has become so peripheral now within the UK that new flats often have no bath at all, simply a 'shower-room'. As such spaces and places for bathing are

diminishing, and 'locking-in' trends towards showering (Hand et al., 2005). Practices also require people's time, as without regular performance from a critical mass of people a practice will cease to be 'normal' or even die-out. Importantly for policy makers, some practices directly compete for performers because they meet the same needs when performed. Cycling and driving compete for many of the same resources, including practitioners' time, finite space on roads, and spending on infrastructure (see Watson, 2012). We examine this example further in Case Study 1 (see page 25).

(b) Encourage more sustainable variants of a practice

Practices have a range of variants, some more mainstream than others. For example, having a meal might involve cooking a vegan meal from scratch, buying a ready meal, or a take-away or eating at a fine dining restaurant. In Case Study 2 (see page 33) we examine how variants have particular trajectories: eating out is on the increase; meat-free meals are becoming more mainstream; ready-meals are no longer necessarily associated with bad nutrition. Such existing trends—which can be revealed by social science research— might be harnessed by policymakers to encourage more sustainable trajectories. In Case Study 3 (see page 37) we examine how material infrastructure can encourage more sustainable variants: such as homes with dedicated space for air-drying laundry, but not for tumble dryers. This approach, in some senses, can be seen as a more radical version of re-crafting practices.

1.3.5 Changing how practices interlock



Harness the complex interactions *between* practices, so that change ripples through interconnected practices.

Figure 10: Changing how practices interlock

A third way of thinking through a practice perspective is to identify how practices interlock with one another[6]. Infrastructure – which influences *where* activities take place, and institutions – which influence *when* activities take place, play a vital part in how practices interlock, and are therefore important targets for interventions in this problem framing. Practices interlock in two ways:

(a) Synchronisation of practices

Peak energy loads caused by millions putting the kettle on in the same TV advert break and the morning rush hour are both caused by the synchronised performance of practices (Shove et al., 2009). We know from social and historical research that changes in the temporal patterns of

[6] For a discussion of the connections between practices see chapter 5 in Shove E, Pantzar M and Watson M. (2012) *The dynamics of social practice: everyday life and how it changes,* London: Sage.

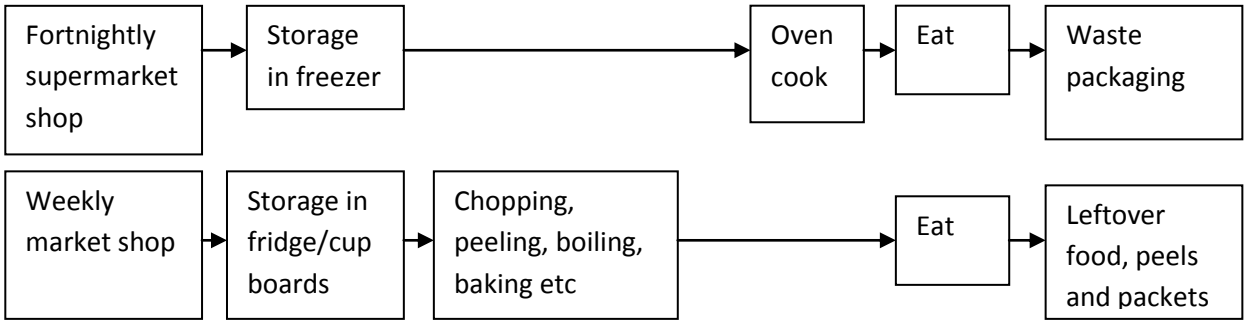
eating (e.g. to three meals a day) accompany shifts in the institutional arrangements of family life, households, and working hours (Southerton, 2009). Debates around the decline of the family meal express concern over the wider social impact of a perceived breakdown in synchronisation (Cheng et al., 2007). Certain forms of synchronisation may be more or less unsustainable. In Case Study 2 (see page 34) we speculate about how the synchronisation of practices might be changed.

(b) Sequences of practices

There are two reasons why there are identifiable patterns in sequences of practices within day-to-day life. The first is that individuals' daily schedules are in-part determined by institutions and organisations: such as school timetables, the working day, and shop opening hours. Such sequences have differing implications for sustainability. For example, as they have co-evolved alongside the driving of private cars, many of these sequences have become dependent on the car. Focusing on these sequences of interlinked practices, and how they might be disrupted, forms an alternative approach to intervening in unsustainable forms of mobility.

The second reason that practices are sequenced is because accomplishing a particular goal requires practices to be performed in a particular order. For example, having a meal at home requires shopping, storing, cooking/preparing, eating and disposing. These sequences might appear logical, but when, where and by whom each aspect is completed is often negotiable. Versions of having a meal depend on quite different sequences (see figure 11). Interrupting, extending, consolidating or re-ordering the sequencing of connected practices offers an untapped opportunity for intervention.

Figure 11: Common sequences of having a meal



1.4 Case studies

We use each of the three case studies of policy that follow—The King Review (2007; 2008), Food 2030 (Defra, 2010) and the Code for Sustainable Homes (2010)—to illustrate:

- How problem framings (1-3)— innovating technology, shifting consumer choices and changing behaviour—are used within current policy.
- How policy reproduces taken-for-granted ways of life, rather than challenging or steering them in new directions.
- How reframing the problem through a practice perspective—problem framings 4-6—extracts targets for intervention from the complexity of everyday life.

2. Decarbonising road transportation: problem framings and the 'space' of intervention opportunities

The King Review (2007; 2008) was commissioned by the UK Treasury in direct response to Stern's (2006) report *The Economics of Climate Change.* Its remit was to examine the potential for the reduction of CO_2 emissions from road transport. The focus on vehicle and fuel technologies was specified by the Treasury, which had implications for the scope of the report and its subsequent recommendations. We introduce it here as the report provides an example of problem framings 1-3.

2.1 Problem framings 1-3: Innovating technology, shifting consumer choice and changing behaviour

The starting assumptions which frame the King Review presume a rising trajectory of private car use. Since the report is written from this starting point, the review and recommendations support and make possible such projections of rising demand. The challenge of reducing per-km CO_2 emissions by 90% by 2050 is framed as one of de-carbonising taken-for-granted forms, scales and rates of growth in mobility. In this sense, as a form of policy intervention, it maintains, rather than challenges, taken for granted ways of life.

This is justified because of the 'economic and social value' of mobility. Mobility is viewed as synonymous with road transport and personal mobility as synonymous with private car use. This policy ambition is succinctly conveyed in the opening paragraphs of the report:

> "Road transport underpins our way of life. In all parts of the world it takes food to markets, shops and homes, doctors to emergencies, individuals to work and back to their families... road transport has dramatically enhanced mobility, economic prosperity and quality of life for billions of people." (King, 2007: 3)

> "Demand for road transport is expected to rise in the future. This will bring benefits for personal mobility and economic growth. For these two reasons, it will generally be preferable to reduce CO2 by improving fuel, vehicle and driver efficiency rather than by reducing demand for travel." (King, 2007: 21)

Eighty per cent of CO_2 reductions are to be met through technological innovations and 10% through 'choices'. As such, within the King Review, 90% of CO_2 reductions map directly onto problem framings 1-3.

Figure 12: A pathway towards decarbonising road transport (King, 2007)

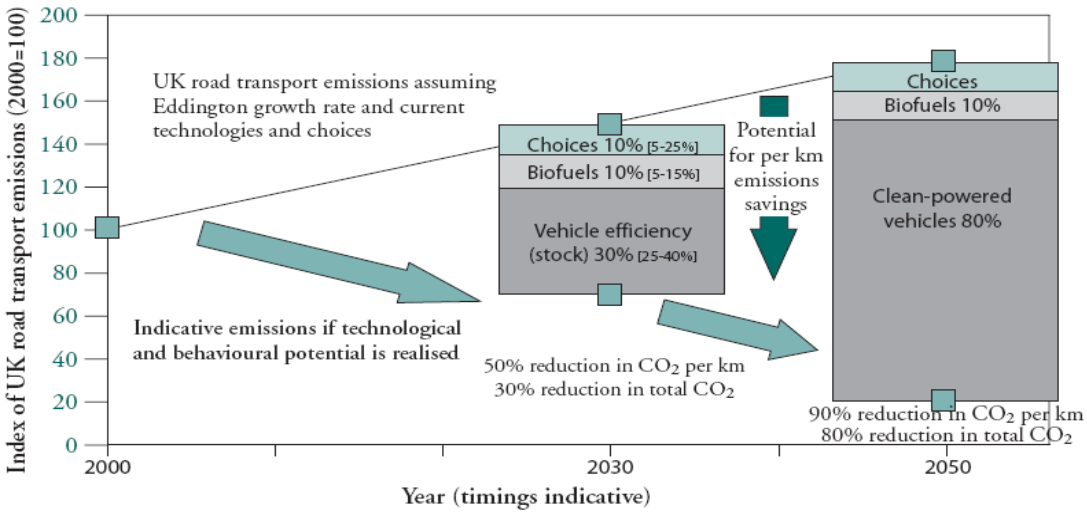


Figure 12 represents King's framing assumptions. This vision of the future and the policy recommendations that follow from it reflect an intriguing combination of adventurous and conservative thinking. On the one hand, the envisaged technological future involves a sequence of technological breakthroughs in batteries, grid infrastructure and, perhaps most challenging, the decarbonisation of electricity. On the other hand, patterns of everyday life are imagined to change very little. The 10% carbon reduction that might result from 'choices' (see Figure 12) is restricted to a set of 'behavioural changes' involving smarter consumer choices for more efficient vehicles and the adoption of fuel-efficient driving (behaviour change).

At the time of writing this report—some five years after the King Review—trends in car use are moving away from the predictions which formed a key part of the problem frame. For example, recent figures (Le Vine and Jones, 2012) support the idea that 'peak car' has been reached, with an increased number of trips by rail for business travel, and much lower levels of car ownership amongst young men. Why these changes have happened requires investigation. The point here is that social change happens and patterns of everyday practice are not static. This supports our position that policy should be both ambitious and optimistic on potential for social change.

In the following sections we draw on a practice perspective to speculate how we might think differently about decarbonising road transport. This is intended to provide a worked example, and we recognise that transport policy in both England and Scotland already has aspects of problem framings 4-6. However, we provide a framework to reflect on these policies systematically.

2.2 Problem framing 4: Re-crafting practices

Re-crafting practices focuses on reducing the resource intensity of existing practices through changing the elements (materials, meanings and competences) that make up those practices. Driving can be thought of as a practice that is made of elements – materials, competences and meanings. Elements of practices are integrated in flexible, but recognisable ways each time a practice is performed. A performance of driving integrates material elements—of the car (the seatbelt, the accelerator, clutch, break etc) and infrastructure (a motorway, a toll gate), competences (clutch control, braking and judgment of distance) and meanings such as convenience

or punctuality. The same performance of motorway driving in an automatic with cruise control would involve a somewhat different set of skills. Urban driving would involve different material elements of infrastructure.

Moreover, practices-as-entities evolve over time. Driving a century ago involved the skill of using a crank starting handle and multiple skills of car maintenance (for the evolution of driving from a practice perspective, see Shove et al., 2012). Driving 40 years ago might not routinely involve the wearing of seat belts, whereas today some models 'script' how driving is done, such that the car cannot be put into gear without the driver wearing a seat belt.

We would suggest that it is possible to reduce the resource intensity of driving by re-crafting elements of the practice. Existing interventions, such as information campaigns about changing how driving is done, alongside changes in the driving test that normalise fuel-efficient driving, would be examples of such re-crafting.

The King Review admits that to date such initiatives have proved largely ineffectual at any significant scale. This doesn't imply such initiatives are necessarily worthless: it could be that ideas of driving *are* being gradually shifted through such initiatives, though their effects have yet to be experienced. However, since practice elements are intimately linked, a practice perspective suggests that intervening in multiple kinds of element at the same time will likely be more effective. This might include intervening in cultural meanings, such as convenience and status, that are associated with driving, the cars that we acquire (which have powerful acceleration and can travel at high speed), the skills that we embody (both via initial driving instruction, but also as we become experienced drivers), the infrastructure that supports driving and the rules that govern how we drive.

Once we begin talking about driving as a practice, we can think more systematically about how policy has intervened previously (such an approach might be applied to practices in other policy areas too). We are not suggesting a focus on learning from other sustainability policies per se. Rather we propose an approach which focuses on how policy has successfully intervened in the *same practice* (in this case driving) in the past. Interventions in performances of driving have a particularly long history due to challenges of road safety, some of which might be relevant to fuel efficient driving. For example: variable speed limits to reduce congestion and improve flow (Abdel-Aty et al., 2006; Long et al., 2012; Papgeorgiou et al., 2008); congestion charging schemes(Shove and Walker, 2010); road design, surfacing, construction and lay-out (Edwards, 2002; Hugh-Jones, 1949); posting and enforcing speed limits (Nilsson, 1991); and, automotive speed limiters (already installed on HGVs, that could potentially be installed in cars) (Comte et al., 2000).

Re-crafting practices focuses on making driving less resource intensive, but does not seek to change patterns and volumes of private car use. Without wishing to diminish the importance of investment in clean car technology, we suggest some bolder thinking on the prospects for changes in how and why society uses road transport. This can lead us to some more adventurous visions of a future where driving is substituted by other alternatives, or where the role of mobility in the context of everyday life has been reconfigured.

2.3 Problem framing 5: Substituting practices

Substituting Practices suggests that policy might focus on discouraging current unsustainable practices and substituting them with existing or new alternatives. The King Review adopts a very explicit association between road transport, private cars and social / economic development. The detail of this association is not spelled out, but if we set aside the contribution of the car manufacturing industry to national wealth, we can justifiably question the association. Road transport is a means to fulfil the societal need for the movement of people and goods. If we shift our focus from driving practices to the broader category of mobility practices, the prospects for modal shift between different types of mobility, such as cycling and driving, become apparent. While this is beyond the remit of King, ideas of modal shift will not be unfamiliar in transport policy circles (Derek Halden Consultancy, 2003).

Modal shift can be seen as an example of substituting practices. Typically, however, transport policy addressing modal shift frames the issue as the analysis of the barriers that constrain individual choices about transport mode.

We have suggested that practices compete for resources— importantly people's time. Practices that fulfil a similar purpose, or the same slots of temporal routine—such as modes of commuter mobility—compete directly with one another (Watson, 2012: 493). We can think about practices as competing to recruit practitioners, or to encourage defection from rival practices – for example from commuter driving to cycling. If we reframe modal shift as *recruitment to and defection from practices* what then would this reframing mean for intervention?

As with the previous framing, elements of practice would be the target of intervention. However the policy ambition—recruitment to and defection from practices—makes this problem framing distinct. Cycling policy has thought about the 'elements' in some detail , for example making the purchase of a bicycle more affordable via workplace 'tax-free' cycle schemes, through the development of cycle paths and routes by Sustrans, and through various campaigns linking cycling to health. However, a practice perspective might help inform future intervention by asking which variant of cycling is being promoted – and whether it is 'competitive' when placed next to driving. This would involve mapping out the range of elements currently available, and identifying which particular *variants* of cycling are supported.

Greater Manchester's Cycling Hub

An example of a policy intervention aimed at modal shift to cycling which does address the specific *commuter* variant is Transport for Greater Manchester's Cycling Hub scheme (http://cycling.tfgm.com/). The city centre Cycling Hub is located conveniently for transfer to rail, tram and bus services and offers commuters dedicated cycle parking spaces, lockers and showers (recognising the intersection between commuter cycling and conventions of cleanliness at work). The Hub also contains a bike shop offering servicing, recognising the importance of reliability in sequencing travel and work, and skills training, addressing a known barrier to commuter cycling—confidence in negotiating urban traffic. Each of these elements encourages new recruits to commuter cycling and defection from driving. This approach is also reflected in the Friend's of the Earth advertising campaign "Fat Lane, Fast Lane" (http://manchesterfoe.org.uk/loveyourbikeintro/fast-lane-fat-lane-ad-campaign-2006/).

Anecdotally, it would seem that elements of leisure cycling are growing in strength (with an increase in off-road cycling routes and mountain biking centres, and special equipment for different kinds of cycling). More difficult to assess is the availability of elements of *commuter* cycling such that the version of cycling which might be found in Groningen, The Netherlands or Copenhagen, Denmark could be 'performed' in England and Scotland. Turning to these examples, such elements might include ideas and meanings of 'cycle chic' such that office attire can be worn on a bike, disrupting the idea that a cycle trip must be followed by a shower – for example, by taking the trip at a less vigorous pace, and the provision of separate lanes within the transport infrastructure. If cycling is to compete for commuters then it is these versions which should be the focus of policy.

Identifying the variants of practices which might become the focus of a 'substituting practices' approach will likely require new kinds of data. For example, rather than the focus on replacing particular trip distances with cycling, interventions concerned with 'substituting practices' would require data about why particular trips are made – what other practices (e.g. shopping, working, other leisure activities) do all these trips enable?– and for each of these 'variants' of driving, how can alternative modes of mobility be promoted to substitute the private car.

Thinking about intervening to encourage defection from driving might also result in more successful policy programmes. Examples include congestion charges and cultural interventions that associate driving with congestion and ill-health and cycling with speed and healthy living, as in the social marketing campaign above.

Here we have discussed recruitment to and defection from different forms of mobility, but within a world where the activities that mobility makes possible remain the same. This overlaps with the activities approach in transport policy. However, a practice perspective goes further by not taking current patterns of activity as either given or static (Watson, 2012: 494). While modal shift assumes a substitution between different *travel* practices the more radical move would be to substitute another form of practice altogether, such as the replacement of journeys by virtual communication. Such substitutions move us to address how practices interconnect with one another.

2.4 Problem framing 6: Changing how practices interlock

How can we harness the complex interactions *between* practices, so that change ripples through interconnected practices? "[P]atterns of contemporary travel are influenced not only by people, but crucially by the practices in which they participate"(Hui, 2013: 90). Practices are connected together in systems, and so changing how one practice is organised will have implications for all the others that it is connected to. Watson provides a useful example:

> "... the shifting character of grocery shopping is inseparable from shifting patterns of personal mobility, with out of town supermarkets co-evolving with patterns of personal car mobility, and with broader restructuring of the temporal rhythms of daily life that are enabled by, and make necessary, the convenience of provisioning a household with a single shopping trip to one destination." (Watson, 2012: 491)

Rather than viewing this mobility as given —as in policies of modal shift—we might intervene in the wider system of practices which produces the need for mobility. In other words, patterns of mobility, or private car use, might have nothing to do with transport policy at all, but be connected to how

households are provisioned, where children go to school, how work and leisure are conducted, and so on.

Thinking through the different purposes of mobility helps to map out systems of practice and points of intervention. John Urry (2007) has identified several kinds of mobility, including the movement of *people* (daily ,annual, once in a lifetime); physical movement of *objects (e.g.* to consumers and retailers), c*ommunicative* travel between people, via text, letter, telephone, fax, email and conference calls. Addressing Urry's different kinds of mobility using a practice perspective suggests three examples through which the amount of travel needed to effectively perform a given practice could be reduced.

The first is to reconfigure the spatial arrangement of everyday practices. The re-development of urban living in cities results in a reduction of distances between work, home and sites of leisure activity – and therefore a reduction in travel.

Where the mobility is largely about facilitating work, and communication with colleagues there are prospects for a shift to virtual alternatives.

> "In half a century's time, it may well seem extraordinary that millions of people once trooped from one building (their home) to another (their office) each morning, only to reverse the procedure each evening…Commuting wastes time and building capacity. One building – the home – often stands empty all day; another – the office – usually stands empty all night. All this might strike our grandchildren as bizarre" (Cairncross, 1997).

This raises the prospect for a major shift in the social organisation of working practices that would have profound effects for commuting distance and frequency. Although this may already have been 'trialled', as will become apparent through the other two cases discussed later, more attention to how practice interlock (for example addressing the lack of social contact that working-at-home entails), and building new spaces and places for work within the infrastructure, might help to speed up the trajectory of change.

An Example of changing how practices interlock:Liverpool Central Library

Though not explicitly designed to reconfigure spaces and places of work, the refurbished Liverpool Central Library is a new kind of city centre space, which speculatively, might bring about this kind of change (http://www.liverpool.gov.uk/libraries/find-a-library/central-library). The inclusion within the design of large amounts of desk space, electric points, pc, internet and print facilities, different forms of workspace (meeting rooms, games areas, reading rooms, lounge areas) means that the library potentially provides a place for people to work locally (which might reduce weekly commutes). That is, for new practices of working to develop.

The library (possibly inadvertently) brings to life the idea of 'community hubs' in which people can work 'from home' in the same venue (see the King's Cross Hub for an example https://kingscross.the-hub.net/). Such hubs not only address some of the social and practical challenges of working from home, such as isolation, or the absence of suitable resources. They also allay concerns about the questionable sustainability benefits of shifting workers from shared offices to individual homes, which could off-set the potential benefits of reduced mobility by increasing overall energy consumption.

The point here is that local spaces, like the Library, could potentially enable interlocking practices of working, commuting, eating and socialising to be radically reconfigured.

The rise of e-shopping over the last decade exemplifies a different type of shift, in this case the movement of goods between producer-retailer- consumer. This still requires the mobility of physical items but there is a shift in who is responsible for it. It is early days in e-shopping and questions remain over the relative fuel efficiency of personal shopping at stores versus e-shopping and retailer delivery. But, there are surely opportunities for learning and improvement in the logistics that would support this alternative mode of provisioning households.

In this final problem framing, we have started to question the assumption that ever increasing mobility will go hand in hand with economic and social development. We do not question the need for many forms of mobility, but do suggest that some bolder thinking about how society might change over the next several decades could open up the possibility that some requirements for private car use will decrease. The examples offered above connect to several of the major contexts for driving: commuting, business travel and shopping. We have suggested that these contexts could change significantly. This takes us away from road or even transport policy as the only context for interventions. Broader aspects of urban planning are clearly relevant; policies to support ever more efficient communications network might serve as a partial substitute for the transport network, and government, firms and architects/ building professions can consider promoting new spaces and places for working that combine practices in new and innovative ways.

2.5 Conclusion

The King Review exemplifies how problem framings that focus on innovating technology, shifting consumer choice and changing behaviour reproduce taken-for-granted ways of life in the futures

that they imagine. They thus encourage the persistence of the problematic practices they claim to allay.

Transport policy is much broader than the remit to which King responded, and as we have suggested existing approaches that focus on modal shifts and activities are policy interventions which a practice perspective would support. The key innovation offered by a practice perspective lies in firstly, identifying 'substitutable practices' and focusing on recruitment to and defection from them and secondly, in showing how mobility interlocks with other practices, thus suggesting that intervening in private car use might mean intervening in policy areas other than transport.

The six problem framings and targets for intervention that we have discussed in relation to mobility are summarised.

Table 4: Six ways of framing the sustainability challenge in relation to road transportation.

Problem framing	Target of intervention
Innovating technology	Reduce the resource intensity of existing (and predicted future) patterns of driving by decarbonising the car (modifying combustion engines, R&D on electric cars) and decarbonising the fuel source.
Shifting consumer choices	Car dealers to provide more and better information to consumers so they can choose more sustainable options.
Changing behaviour	Encourage individuals to adopt fuel efficient driving, for example through information campaigns and changing the driving test (and how 'good driving' is taught).
Re-crafting practices	Change the elements of existing driving practice to encourage the move to fuel efficient driving. In addition to information campaigns (understandings) and changing the driving test (skills, competence and know-how), intervene in the infrastructure and vehicles which also play a part in how driving is performed.
Substituting practices	Encourage the replacement of driving with other alternatives by ensuring these alternatives directly compete with driving for 'recruits'. For example, re-craft cycling so that it directly competes for commuters.
Changing how practices interlock	Intervene in the spatial and temporal organisation of practices to change how mobility interconnects with shopping, work, habitation and so on.

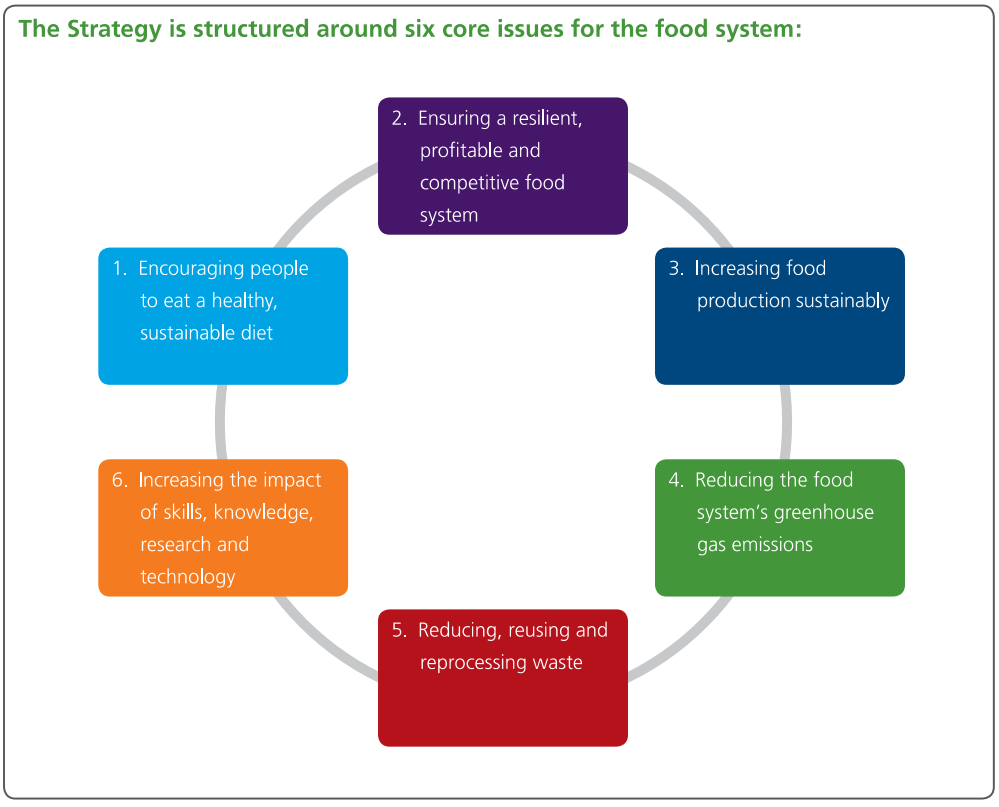
3. Sustainable food: from food to eating practices

Food as a policy area is selected for examination based on the significant contribution of food systems to GHG emissions—an estimated 22% of all emissions associated with UK economic activity. Furthermore, one third of these emissions are associated with the eating practices of consumers (Defra, 2010). We focus on the general challenge of shifting food consumption in more sustainable directions by again contrasting problem framings commonly found in current policy – as neatly captured in Defra's 'Food 2030' report – and the intervention opportunities they afford, with those offered by a practice perspective. Since the case study in question does not deploy the 'innovating technology' framing with respect to food consumption (this framing is reserved for the production and delivery of food), we turn first to those of consumer choice and behaviour change.

3.1 Problem framings 2 and 3: Shifting consumer choice and changing behaviour

In 2010 Defra published Food 2030, a comprehensive report on the UK food system that set out the key challenges for achieving: healthy and sustainable diets; a resilient, profitable and competitive food system; increasing food production sustainably; and, reducing waste. Impressive in its breadth, the report represents an authoritative synthesis of research and policy understandings of the entire food system, and how its core components relate to one another. These core components are: primary production; food processing; distribution; retail; catering; and consumption. The report presents a strategy structured around six issues (Figure 13), with critical 'actors' in the system identified as: consumers; food processors; food businesses; food manufacturers; and, government. It is the focus on consumers and the encouragement of healthy and sustainable diets to which this discussion is directed.

Figure 13: the six core issues identified by Food 2030 (Defra, 2010: 9).



Consumer choice and behaviour are pivotal to the strategy because of the view that they drive the entire system by creating demand:

> '…producers, manufacturers, retailers and the food service sector all respond to market signals that originate with consumers – it is their demand that drives the food system.' (Defra, 2010: 47).

Consumers' choices are presented as 'constrained by knowledge, time, cost, convenience and retail offers'. Businesses play a role in 'leading demand through advertising and influencing consumer choice' (Defra, 2010: 47), while the responsibility of government is to correct for 'market failures', such as accounting for price externalities, ensuring competition, and correct information. Framed in these terms the role of the consumer is cast in terms of their capacity to choose food products. To change such behaviour is presented as a matter of informing those choices and providing support for socially preferable options using market incentives (e.g. pricing) or through educating and re-skilling consumers.

Examples include product labelling for seasonality, a 'healthier' food mark for public organisations, a 'healthy eating' website, revamping food date marking, and better information regarding retail 'special offers' and portion sizes. Behaviour change oriented education also features, primarily through community-based schemes that provide education about recipes and cooking skills. Community-based schemes are also identified as mechanisms for delivering affordable healthy foods to low income groups. Beyond information and education, however, the report offers very little by way of policy intervention. Domestic energy consumption embedded in eating practices is recognised only with reference to encouraging the use of green energy tariffs. Personal transport emissions associated with household food consumption are ignored.

The 'systems' approach to food consumption presented in Food 2030 is particularly strong in representing a future in which the different parts of the system, and the actors involved in shaping it, are 'joined-up' and coordinated. This is to be commended. However, it assumes business as usual as regards the organization of the key aspects of food consumption, the dominant supply chain will remain international, supermarkets will continue to be the principal mode of food provision to households; and domestic preparation and consumption will continue to dominate eating practices.

However, just as fast food, take-away home deliveries, frozen food or ready meals would have been unimaginable a century ago, radically different trends in food consumption are imaginable. For example: the disappearance of domestic cooking (as is the case in parts of Asia where domestic accommodation is too restricted for routine cooking to take place); mass collective provision of food; state agricultural protectionism in the context of global food insecurities; or, perhaps, radical technological innovations in relation to GM foods (see, for example Gronow and Warde, 2001) or pharmaceutical products such as nutritional pills (Southerton, 2009).

What might radical changes in the way we eat and organise our eating practices mean for sustainable food and what kinds of interventions are revealed by thinking in these terms?

3.2 Problem framing 4: Re-crafting practices

Re-crafting practices focuses on reducing the resource intensity of existing practices through changing the elements (materials, meanings and competences) that make up those practices.

Focusing on practices of eating makes clear that changing how and what we eat is about much more than choosing different products. What and how we eat is about tastes, sociability and conviviality, cultural conventions (e.g. a 'proper meal'), competency, routines (e.g. three meals a day) and income. It is all these elements together that make eating what it is.

History shows that eating practices have changed significantly in the past 60 years. For example, the decline of hot lunchtime meals and rise of the sandwich; a general rise in eating out; and, broader tastes in food across social groups. Further, tastes are dynamic. Whereas some meal formats, such as the traditional roast dinner, have been a feature of the British diet for many years, other types of dish have emerged as cultural favourites, not least being the 'curry', 'Chinese', and 'Italian' influenced dishes (Southerton, 2006). So how might the elements of eating practice – ideas of what tastes good, the sociability of eating, and the routine ways in which particular forms of meal are consumed – be re-crafted to direct eating along more sustainable trajectories?

The ways in which new tastes emerge is often multi-faceted. The influence of cooking and eating enthusiasts (gastronomes); cultural and market intermediaries (celebrity chefs), and the infrastructures of food provisioning (rise of supermarkets, decline of work-based canteens), are all widely identified as playing an important role. Notably, these changes in taste primarily relate to the *meal* and the social context in which it is consumed, rather than the *product* focus of the consumer choice framing. This suggests the meal and its social context as the focus of policy interventions.

Jamie's School Dinners campaign would be one example of this. But, these do not always need to be bottom-up initiatives, for example the New Nordic Diet programme in Denmark utilised cultural and market intermediaries to champion new tastes and new forms of meal.

The New Nordic Diet

The New Nordic Diet is an integrated policy programme that demonstrates many of the features of the practice perspective, although it is not generally explicitly framed as such. The programme was developed out of a five year multi-disciplinary research project focused on the promotion of a novel healthy and sustainable cuisine. The programme aimed to develop a healthy, environmentally sustainable diet based on foods originating from the Nordic region (Mithril et al., 2012). The programme enrolled multiple actors, including fashionable restaurants and chefs, high-profile political supporters, legitimating scientists, disseminating media, and actively interpreting audiences, enabling rapid diffusion (Byrkjeflot et al., 2013). It addressed multiple elements of practice, including skills (offering cookery courses) and meaning (it was conceived as an identity movement), and actively sought to recruit practitioners to the novel culinary variant through organized dissemination and the enrolling and support of innovative initiatives (ibid.).

A final observation is that many meals are consumed in relatively habitual and routine ways. That is to say that the particular kinds of meal that a household consumes during a week, ideas about what makes a 'normal' breakfast, lunch or dinner are shared at a societal scale. Seeking to intervene in such routines and conventions represent relatively untested interventions, for example encouraging

household weekly menus that include a number of vegetarian dishes, or perhaps choice editing in work-place sandwich shops to encourage meat-free lunchtime meals.

This problem framing, re-frames the sustainability challenge as one of changing the content of meals through shifting tastes and changing cultural conventions. For example, changing ideas of what constitutes a normal breakfast, lunch time or evening meal, rather than focusing on consumer choice of products. Such interventions might relate to social marketing and pricing mechanisms to encourage shifts in meal tastes and associated energy requirements of cooking; or targeting conventions of sociable dining to shift meal patterns, or intervening in the form and content of meal routines.

3.3 Problem framing 5: Substituting practices

A second step extends this line of thinking to consider potential substitution of resource-intensive eating practices with more sustainable alternatives. Despite the assumptions of Food 2030 that eating practices are static, they are actually constantly changing – as growing trends such as eating out testify. There is therefore potential for interventions to encourage such trends when they offer more sustainable alternatives.

While Food 2030 is primarily concerned with domestic eating practices, much food consumption occurs beyond the home. In the UK eating out, in all its forms, is on the rise. In such cases, the resource-intensive aspects of eating – provisioning of ingredients, food storage, cooking and waste - are largely beyond the consumer (Shove and Warde, 2002), whose options are constrained to choice of venues and selection from a menu.

This raises the question of the implications for sustainability if domestic eating practices were substituted by eating out. Potentially, if undertaken at a mass scale and on a regular basis, this could produce significant energy consumption reductions through the declining use of domestic energy for cooking and refrigeration. Catering industry standards might regulate energy consumption and even food stuffs to increase gains further. To what extent sustainability gains could be made through such measures is an empirical question not considered in Food 2030. The point of raising such possibilities here is to show how a problem framing that addresses trajectories of changing practice opens up different spaces for policy intervention. A future into which current trends of eating out are extrapolated suggests information and pricing interventions aimed at influencing choices would be more effectively targeted at and through food outlets than to domestic consumption.

Mass commercial (and/or state-subsidised) production of meals might also form part of such a substitution of eating practices, with a return to lunchtime as main meal of the day catered for through workplace canteens and restaurants. Such shifts could produce a future in which energy-intensive meals are collectively provided, while domestic meals are configured as lighter meals comprising a greater proportion of raw ingredients (e.g. varieties of salad). Such a shift would require interventions to promote eating out, especially during the daytime and while at work. This would mean influencing the tastes, meanings and components of lunchtime and evening meals, with implications for how food is provisioned and shared.

A further prominent trajectory of eating practices has been the rise of pre-prepared food taken at home. A continuation of this trajectory might also result in current eating practices being substituted for those requiring less domestic cooking.

Interventions imagined in this second step are based on encouraging existing variants of eating practices: partial or complete substitution of domestic eating with eating out in the local community; return of lunchtime as the main meal of the day provisioned collectively (e.g. in the workplace) accompanied by less domestic storage/cooking/eating; continued eating at home but less domestic cooking through the purchase of pre-prepared, yet nutritional, foods. Fostering such shifts may not require the intervention of radical new policy levers. Pricing mechanisms related to eating out, nutritional guidelines focused on meals rather than ingredients and supported workplace eating initiatives, could all play an important role. Such policies, however, would need to be mobilised by multiple actors (government, retailers, consumers) to deliver step changes in eating practices.

3.4 Problem framing 6: Changing how practices interlock

In this final step we explore ideas for encouraging sustainable food consumption by considering how eating interlocks with other practices—for example, how it is synchronised and sequenced with other practices such as caring for a family, socialising, working, travelling and even watching the television.

Eating while conducting other practices is a prominent feature of everyday routines, such as watching television, travelling, working, shopping and so on. Such eating patterns are often associated with an emerging prevalence of snacking. Even if diets based on snacking proved more sustainable, encouraging such a trajectory would be controversial given its association with poor diet. However, we include it here as it is a trajectory of eating that pulls away from the dominant routine of three meals a day (which is simply the latest historical pattern of eating routines). For example, we might speculate that a shift to a larger number of smaller 'eating events' might result in large-scale changes in food provisioning and quantities of food consumed. Eating practices, which are possibly 'secondary activities', or at least no longer organised around meals, engender different social meanings. For example it would be impossible for snacking to reinforce social meanings of 'a good hearty home-cooked meal'. This evolving form of eating might therefore be an opportunity to craft new social meanings and tastes. Interventions might encourage non-meat or dairy dishes, or a diet in which the proportion of meat and dairy to vegetarian dishes is altered.

A second suggestion is to consider further that much eating occurs at or for the purposes of work. Business entertainment, lunchtime buffets and workplace cafes represent a significant portion of eating. As suggested in problem framing 5, the substitution of domestic with workplace eating represents one possible focus for policy interventions into eating practices. Here we take this a step further, suggesting that to understand and intervene in eating requires an understanding of work practices and the place of eating within them. The sociability of eating is one reason that such practices present an important aspect of business activity. Focusing on this aspect of working practice, large businesses and the public sector could enrol procurement services to steer workplace catering hospitality events towards more sustainable eating through standards or regulation for meal content and energy efficiency in cooking and refrigeration. New workplace sustainability accreditation or labelling schemes, together with choice editing in workplace catering, presents an opportunity to stimulate tastes for alternative meal contents and formats. Intervention in this context is located at the level of institutions and organisations, seeking to reconfigure both work and eating practices in more sustainable directions.

A further example relates to how households are provisioned with foodstuffs. Online grocery shopping represents a shift in the way that food is delivered to homes, substituting the use of private transport for retailer deliveries. Other forms of collective provision are also imaginable, such as Japan's mass membership local retail co-operatives. Again the potential sustainability gains here are an empirical question. Frequent shopping deliveries to local neighbourhoods might reduce food waste via the regular provision of perishable foodstuffs or even composting services (see Evans, 2012).

A final point of intervention in imagined future eating practices might take the form of anticipating trends in household composition. Current trends indicate a rising number of single person households, an ageing population, an increase of homes of multiple occupancy (e.g. shared houses - especially in early adult life) and a continued diversification of family structures. Each of these trends may reduce the standard family household model that currently underpins domestic eating practices.What new forms of collective eating, sociability, non-domestic meals, cooking and provisioning might emerge from such trends? The suggestions in problem framings 5 and 6 of this section each offer different scenarios regarding how those food practices might be organised. While the sustainability gains of each is yet to be estimated, thinking through food consumption in terms of eating and how it interlocks with other practices offers the opportunity to anticipate, exploit and promote such trajectories in designing policy interventions.

3.5 Conclusion

Food 2030 places great emphasis on the significance of consumers and food consumption, but presents a conservative framing of how food consumption is changing. As such, the report envisages the future largely as it is now, with consumers demanding healthier and more sustainable food once the appropriate information is provided on food labels (predominantly in the form of products on supermarket shelves). The three practice perspective framings show how policy might be more ambitious in the changes to eating envisaged. Such futures are not as far out of reach as we might first think.

Eating practices are not static, they are changing all the time, and policy might harness some of these trends, encouraging particular practices to evolve. The interventions that result from this thought-experiment are speculative in the absence of research to estimate the sustainability implications of such shifts towards more work-based provision of main meals, more online grocery provisioning, less domestic cooking, and so on. Such analysis is absent because the current framing of sustainable food consumption excludes such ideas from consideration, the focus being on individual choices in the contexts of supermarket shelves. And yet examination of corresponding shifts in many related practices like mobility or work might well provide greater scope for imaginative and, perhaps, more radical visions of what future food consumption might look like. The problem framings and targets for intervention are summarised in the table below.

Table 5: Five ways of framing the sustainability challenge in relation to food consumption.

Problem framing	Focus of intervention
Innovating technology	Not discussed in Food2030 with respect to food consumption, despite scope for technological changes in the domestic storage of food and food delivery.
Shifting consumer choices	Provide information on more/less sustainable foods. Encourage better understanding of food date marking. Education on food providence. Market incentives – encourage use of green tariffs (prices, promotions, offers).
Changing behaviour	Encourage individuals to eat more sustainable foodstuffs through providing cookery classes about the preparation of meals made from sustainable ingredients.
Re-crafting practices	Re-craft the elements of existing eating practice, for example promote tastes for meals that contain less meat/dairy. Or target the presumed make-up of particular meals, for example promote meat-free lunches.
Substituting practices	Encourage the replacement of unsustainable trends in eating with the most sustainable variants. Data and modelling would be required to identify these, but they might include reducing domestic eating and increasing the dominance of eating out, or continued eating at home but with a demise in domestic cooking.
Changing how practices interlock	Intervene in how eating interlocks with other practices to create more sustainable eating patterns. For example work with workplace hospitality and catering procurement to change how food is provisioned.

4. The Code for Sustainable Homes

The Code for Sustainable Homes came into operation in 2007 and has been an important and sometimes controversial document. It sets out a method for assessing the sustainability of new homes built in England, Wales and Northern Ireland, and is based on a credit system used to evaluate a wide range of features, ranging from the provision of recycling facilities through to the types of materials used in construction. The credits are added together and used to rate a building's performance at one of six possible levels, level 1 being the lowest and level 6 the highest. Although the Code does not apply in Scotland, we focus on it here as an exemplar of a policy intervention that works across all five of the problem framings set out in Table 6 below.

In terms of ambition and purpose, the Code is primarily designed to inform *consumers,* allowing them to take sustainability into account when buying a new home, thereby altering the wider market. At the same time, the substance of the Code demonstrates an affinity with other styles and modes of policy intervention, including those of regulation. In this respect the Code is designed to inform the detailed planning and construction of more sustainable homes.

The Code's dual status reflects longstanding and unresolved debates about where responsibility for the environmental performance of the built environment really lies: is it with the designers of the building, or with house buyers and occupants? Its ambivalent position (as design guidance and/or as instrument of market transformation) also reflects different philosophies of state and market-based intervention. The current government's position is that the Code provides a standardised method for assessing sustainability, the use of which is voluntary. Having said that, local authorities can require compliance to a certain level in their local plans, and there is some overlap in that some of the features assessed in the Code are already mandatory as part of the building regulations. Looking ahead to 2016, building regulations will require that the code level 6 performance of 'zero carbon' emissions is achieved.

Co-existing problem framings

Table 6 below lists the categories and issues covered in the Code (original table in Department for Communities and Local Government, 2010), with a column indicating the type of problem framing to which each relates. The list includes measures that exemplify 'innovating technology'(problem framing 1) in that they focus on enhancing technical efficiency (advocating A rated appliances; high levels of insulation and natural daylight; promoting the use of sustainable materials) without impacting on the way in which people live their lives. Others are framed in terms of shifting consumer choice and changing behaviour (problem framing 2 and 3), emphasising the provision of energy display devices and home user guides. Meanwhile, some parts of the Code clearly intend to provide the infrastructure such that existing practices might be re-crafted (problem framing 4), or substituted (problem framing 5) with less resource intensive and lower carbon alternatives. For example, the provision of an indoor or outdoor drying space to re-craft laundry practice, the provision of bicycle storage space to make substitution of cycling for driving more feasible, and the inclusion of recycling and composting infrastructure within the home. Finally, problem framing 6 refers to instances in which the location and wider configuration of practices is in question – the role of infrastructure within systems of practice. For instance, where should spaces for work be built into the infrastructure? (within city centre office blocks? Within the home?), and what kinds of work should be provided for?

Table 6: Summary of Environmental Categories and Issues

Categories	Issue	problem framing	available credits
Energy and CO2 Emissions	Dwelling emission rate (M)	1	10
	Fabric energy efficiency (M)	1	9
	Energy display devices	2	2
	Drying space	4	1
	Energy labelled white goods	2	2
	External lighting	1 and 3	2
	Low and zero carbon technologies	1	2
	Cycle storage	4 and 5	2
	Home office	6	1
Water	Indoor water use (M)	1 and 3	5
	External water use	3	1
Materials	Environmental impact of materials (M)	1	15
	Responsible sourcing of materials – basic building elements	1	6
	Responsible sourcing of materials – finishing elements	1	3
Surface Water Run-off	Management of surface water run-off from developments (M)	1	2
	Flood risk	1	2
Waste	Storage of non-recyclable waste and recyclable household waste (M)	4	4
	Construction site waste management	1	3
	Composting	4	1
Pollution	Global warming potential (GWP) of insulants	1	1
	NOX emissions	1	3
Health and Well-being	Daylighting	4	3
	Sound insulation	1 and 4	4
	Private space	3 and 4	1
	Lifetime Homes (M)	3 and 4	4
Management	Home user guide	2 and 3	3
	Considerate Constructors Scheme	2 and 3	2
	Construction site impacts	1	2
	Security	1 and 2	2
Ecology	Ecological value of site	1	1
	Ecological enhancement	1	1
	Protection of ecological features	1	1
	Change in ecological value of site	1	4
	Building footprint	1	2

In describing these co-existing problem framings the point is not to argue that the Code is flawed, but to show how the multiple interventions of the code might encourage or challenge the persistence of resource intensive ways of life.

4.2 Problem framing 1: Innovating technology

The Code devotes significant weighting to the thermal efficiency of the building fabric, and to the sustainable qualities of different materials (timber, brick, etc.). These features do not have an immediate bearing on the types of activities that go on indoors, or on how these are arranged (in terms of spatial arrangement and scheduling). Rather, the aim is to increase efficiency without making any difference to the level of 'service' provided. This logic also applies to the credits given for installing more efficient appliances, or to the use of devices that reduce the water consumed in toilets and showers (providing this is not detected by the user).

Measures that fall into this category are designed to have effect without challenging normal practice. However in figuring at all, they do have some part to play in reproducing a certain sense of 'normality'. For example, the Code supposes that each home will have a washing machine, dishwasher, tumble dryer and toilet. In other words, efficiency standards are considered with respect to forms and types of consumption that are themselves taken-for-granted. Similarly, the code highlights that the idea of lighting outdoor spaces is legitimate, providing the lights only come on in the dark.

4.3 Problem-framing 2 and 3: shifting consumer choices and changing behaviour

4.3.1 The Code itself as an aid to consumer choice

As mentioned above, the Code has at least two roles. In providing a standard for designers to follow, it provides a judgement within the otherwise contentious debate about what is to count as 'sustainable' and how relevant measures are to be defined and evaluated. It provides a common point of reference on this topic. It is also designed as an instrument of market transformation. In this capacity, the Code formalises judgements of sustainability and brings new criteria into the process of comparing and valuing new homes.

This latter role is consistent with the view that demand exists for sustainable homes, but that consumers do not have enough data on which to base properly informed choices – resulting in a form of market failure. From this perspective, the Code's purpose is to help house buyers differentiate between properties that are more and less 'sustainable'. The hope is that when properly informed they will select properties with a higher rating and in the long run, change the market for sustainable homes.

4.3.2 Categories within the Code that foreground consumer choice

The Code gives three credits for the provision of a home user guide (compared to one for clothes drying space or one for home office provision); and two for the inclusion of energy display devices. The idea of scoring points, for having devices that reveal energy use is justified on the grounds that such information empowers "dwelling occupants to reduce energy use" (Department for Communities and Local Government, 2010: 46). If they are to count in the scoring system, home user guides have to cover a checklist of topics including specific operating and

maintenance instructions along with much more generic water and energy saving tips. Again the basic proposition is that householders will act differently if they know "how to run the home efficiently and in the best environmentally sound way", and that providing they know about local facilities for cycling, recycling and more they will be in a position to make better, more sustainable 'choices' for themselves.

4.4 Problem framing 4 and 5: the role of infrastructure in re-crafting and substituting practices

A marketing strategy report produced for the sector by the Zero Carbon Hub (Zero Carbon Hub and Energy Saving Trust, 2010) has the tag line 'the new normal'. This phrase suggests that there are other ambitions afoot and that the Code is not merely about helping consumers meet existing needs: it is also about helping to establish new interpretations of normal practice. By implication those who live in Zero Carbon homes will be living new, Zero Carbon, ways of life.[7] This is explicit in the opening paragraph which states that the 2016 zero carbon standard 'will not only mean major changes for the industry in the way homes are built but also major changes for consumers – both in the design of the homes they will buy and in the way they will live day-to-day in these homes' (Zero Carbon Hub and Energy Saving Trust, 2010: 4). Similarly there are references to the housing industry as an industry that is capable of 'building lifestyles'.

This makes sense in that the detailed design of a home clearly impacts on the sorts of activities that go on within it, on how social practices (eating, cooking, sleeping, showering, washing, studying, watching TV and so on) are configured, and what this means for resource consumption. This point that buildings accommodate activities/practices has been around for a long time. It was recognised in the 'Parker Morris' report 'homes for today and tomorrow' (1961) a massively influential document which informed space standards in the UK between 1960 and 1980. In the words of its authors, "this report is not about rooms so much as about the activities that people want to pursue in their homes – which taken as a whole can be catered for in a wide variety of ways…The approach is flexible…**Arrangement and rooms are the results, and not the starting point**." (bold added) (Parker Morris quoted on http://homesdesign.wordpress.com/2010/12/18/homes-for-today-and-tomorrow-more-on-the-parker-morris-standards/, accessed 01/05/2013).

We note above that the Code sets out 'a new normal' – designing homes which will cater for new and more sustainable ways of living. If houses reflect and script social practices, it makes sense to ask which practices are 'inscribed' in the Code itself – does the code achieve its ambition of creating 'the new normal'? The three examples of drying clothes, storing bicycles and producing waste demonstrate some of the ways in which understandings of legitimate and appropriate practice are woven into the Code.

4.4.1 Drying clothes

The Code scoring system rewards developers who provide space and equipment for drying clothes outside (minimising the 'need' for a tumble dryer), thus encouraging the re-crafting of laundry

[7] Nb recent analyses of the consumer market (Zero Carbon Hub and Energy Saving Trust. (2010) Marketing Tomorrow's New Homes: Raising Consumer Demand for Low and Zero Carbon Living.) have recommended a reframing of the selling position away from 'zero carbon new homes' to 'new homes that are zero carbon' emphasising the challenge of 'normalising new features' rather than highlighting them as something 'futuristic and experimental'.

practice. According to the Code, for 1-2 bedroom dwellings, the drying equipment must be capable of handling 4+ metres of laundry (the figure is 6 metres for 3 bed homes). So how many clothes can you fit on 4 metres of washing line, and what does this length say about the quantity and frequency of laundry? Rotary washing lines provide 35 – 60m; and a 'standard' length of washing line is 10m. We might estimate that 4 metres would take something like 7 shirts and a pair of jeans. By implication, the Code is designed for inhabitants who do not dry a large amount of laundry all at once. The Code also supposes that occupants are extremely concerned about the security of their wet washing. In order to qualify for Code recognition, washing lines must be "secure": they must be situated in a locked space only accessible to the residents themselves. It is impossible to be certain, but the reasoning seems to be that people will only use washing lines that are so protected: hence only these arrangements count.

While the Code promotes outdoor drying, there is a limit as to how far this goes. For example, points are not taken away if homes are designed to accommodate tumble dryers when there is space for a line outside. Whilst there is some move to facilitate line drying, there is no parallel effort to actively restrict tumble drying and in that sense the Code does not promote outdoor drying as far as it could. Furthermore, because of the focus on fixed features of the building structure, the Code, in fact, demands fixings, footings and posts capable of holding a line, but does not require the line itself to be in place.

4.4.2 Cycle storage

The code gives two points if there is sufficient cycle storage for one bicycle per bedroom (e.g. you get two points if there is space for 2 bikes for a 2 bed house), and one point if there is room for one bicycle for every two bedrooms. In terms of problem framings, this is underpinned by the idea that the substitution of cycling for driving will be more feasible and convenient if cycle storage is provided. However, these points are only awarded under certain circumstances. To qualify, the bike storage area must be secure, meaning that the arrangements comply with clause 35 of Secured by Design (SBD) New Homes 2010()()()()()()()()()()(). It must also be outside. In other words there are no points for keeping a bicycle inside, and none for a folding bike which is stored indoors. It is, however, possible to qualify for points if the cycle/s are kept in a porch. This is interesting as those who cycle on a regular basis (e.g. for the daily commute) might be likely to keep cycles in the hallway of the house near the front door (a form of storage which receives no points). This connects to our discussion of competition for recruits to cycling practice in the King Review section (see page 26), and how particular variants of cycling might be more successful than others when it comes to competing for 'recruits' from driving practice. Taking 'competition for practitioners' as the starting point might result in a different allocation of points, rewarding such aspects as the convenience with which a bike can be accessed and engaged as a form of transport, and would encompass a range of variants of cycling which might include the folding bike. Further the Code might encourage defection from driving, for example by restricting parking space, or specifying that this should be as far away from the home as possible.

4.4.3 Waste production

Throughout the Code, there is quite some discussion of the space needed for waste bins and recycling and there are a number of assumptions about the volume of the bins involved and hence the extent of the waste stream (Chappells and Shove, 1999). As such the Code supports the introduction of the practice of recycling. The required volume is 100 litres for a single bedroom

dwelling, with 70 litres more needed per additional bedroom. People are not expected to carry household waste for recycling more than 10 metres from the kitchen, or 30 metres for other waste, and composting has to happen outdoors. It is not at all obvious where these figures come from, or how they relate to other also relevant standards – e.g. the standard wheelie bin is 240 litres. Different arrangements are permissible depending on the Local Authority and the waste collection regime, yet there is never allowance for more than three 'types' of waste. It is also clear that this emphasis on private provision (not walking more than 30m to collective bins/composting) would potentially exclude systems that are designed around a much more collective way of living – as is the case with certain eco-home developments. In addition, provision of waste management on this scale does nothing to address related practices (including those of packaging providers, supermarkets etc.) which have a part to play in making 'normal' volumes of waste, and in therefore making the 'need' for waste 'guzzling' devices like the Wheelie bin. Put simply, though the Code supports the new practice of recycling it takes the production of a certain volume of waste entirely for granted.

To summarise, points relating to drying clothes, cycle storage and waste recycling are designed to reconfigure existing practices through ensuring the provision of relevant infrastructure. However, the extent to which they do so is constrained by a series of related conventions and assumptions, for instance, about the need to keep the washing safe; about the spaces where bikes should and should not be stored, or the volume of the waste stream. Whilst promoting some 'new' practices, the Code keeps other conventions firmly in place. This unintended consequence would result from any code, but making this explicit from the outset and thinking through the potential for recrafting or substituting practices has the potential to broaden the scope of this kind of intervention.

4.5 Problem framing 6: changing how practices interlock

The Code refers to the design and operation of the home, but there are a few instances in which it deals with potentially significant shifts in what happens 'at home' - in where specific practices are enacted – and thus intervenes in how practices interlock. An obvious example concerns provision for home working. It is possible to 'earn' one point by providing a home office, on the grounds that this might encourage people to work from home and travel less. It is an intervention in the built environment that harnesses the current societal shift towards more flexible working (Shove et al., 2009) for sustainability goals (reducing private car use). As noted above, in promoting new practices, the Code also holds other aspects of 'normal' in place. In this case it is an idea of the kind of space that 'working' requires; with broadband access, two double electric power sockets, a double phone point, a window and a space for a filing cabinet, a particular kind of office work is catered for. Notably, there is an assumption that this new kind of home-based work must be undertaken within the private dwelling of the home.

These kinds of assumptions about private and public are also seen in the Code's assumptions that the home is the place where myriad practices of washing, laundering, eating, sleeping, and working are undertaken in private. In this respect the Code faithfully reproduces potentially unsustainable arrangements in which facilities are not more widely shared. Each home is a separate 'island' of resource consumption and considering if services might be provided in another way (e.g. collective laundries, collective workspaces) falls outside the frame. Finally, although homes are clearly part of wider systems of practices – including of mobility and provisioning - the assumptions embedded in the Code do not tie in with concepts explored in cases 1 and 2, for instance changing how foods are

provisioned, delivered, stored, cooked and eaten would require changes in the infrastructure of homes and communities.

4.6 Conclusion

Whilst seeking to modify some areas of daily life, the Code carries and reproduces very many assumptions about normal practice. By implication, sustainability is something that can be achieved without challenging established ways of life. The most compelling example of this is the failure of the Code to address house size, for example the Code makes special provision for calculating energy loss in bungalows– indicating that the challenge is to find ways of accommodating inherently inefficient forms rather than actively preventing their construction. This raises further questions about whether sustainability should be viewed as a single state of affairs (the Code for Sustainable Homes) or as a matter of degree, and of contest and negotiation. In this context it is important to think about how much sustainability is required and about the scope of legitimate policy intervention

This reading of the Code for Sustainable Homes demonstrates the coexistence of different problem framings, assumptions and strategies. As illustrated below, each problem framing rests on a different account of how and why change comes about, and each justifies a different mode and style of intervention.

Table 7: Six problem framings of the sustainability challenge in relation to the home

Problem framing	Type of intervention
Innovating technology	Reduce resource intensity of all the practices which take place within the home by awarding credits for use of particular materials, and construction techniques, and particular technologies (e.g. outdoor lighting that turns itself off during the day).
Shifting consumer choices	Use the code level and certification to market homes that are sustainable but also 'normal'.
Changing behaviour	Give points in the Code for home user guide and devices that show energy use so that individuals can change their behaviour.
Re-crafting practices	Specify within the Code which 'elements of practice' might be included in the infrastructure to make existing practices more sustainable. E.g. incorporating space to dry clothes is within the code. The code could go further by discouraging resource-intensive versions of clothes-drying e.g. by removing space for tumble dryer.
Substituting practices	Promote and provide infrastructures that make new practices possible, (i.e. create new spaces and places for practice) e.g. communal kitchens, eating areas and laundries, removing space and facilities from individual homes.
Changing how practices interlock	Interventions in infrastructure designed to change where, when and how practices are enacted e.g. Home office.

5. Interventions in practice: Conclusion

This report develops a framework that can be used to identify problem framings in existing sustainability policy and proposals. It outlines the limitations of current, common framings and introduces the opportunities for sustainability policy interventions afforded by a practice perspective. It outlines three problem framings currently dominant in policy (innovating technology, shifting consumer choice and changing behaviour), and introduces three alternatives which take practices — rather than behaviour or technology—as the unit of intervention.

The report has four key messages:

- Problem framings have implications for what are viewed as plausible and possible targets of intervention. Understanding the logic of problem framings, and being able to identify them, enables policy makers to see clearly how they constrain or enable options.
- Policy interventions seeking to promote sustainable consumption should be re-framed from a practice perspective: that is, they should take practices as the units of intervention. This contrasts with intervening in behaviour, consumer choice, or technology alone.
- Practices are always changing, whether or not there are deliberate interventions designed to steer them in one direction or another. Since such 'trajectories of practice' already exist it makes sense to ask how they might be guided in more sustainable directions. This is a different approach to that of designing one-off interventions to promote more sustainable behaviour and suggests the need for different kinds of evidence.
- Changing how sets of practices interlock is a powerful form of intervention offered by a practice perspective. This report foregrounds the point that sets of practices are held in place by spatial arrangements within the infrastructure and through the temporal rhythms and routines of institutions. Intervening in sets of interlocking practices therefore requires intervening in the institutions and infrastructures that hold such arrangements in place.

In essence we promote the idea that individual behaviours are, primarily, performances of social practices. This is illustrated in the figure below. Rather than being the expression of an individual's values and attitudes, behaviour is the observable expression of social phenomenon (socially shared tastes meanings, knowledge and skills, and materials and infrastructure). As such behaviour is just the tip of the iceberg, and the effects of intervening in behaviour are correspondingly limited. It is the practice entity – the socially embedded underpinning of behaviour – which we argue forms a better target for policy makers concerned with reducing the resource intensity of current ways of life.

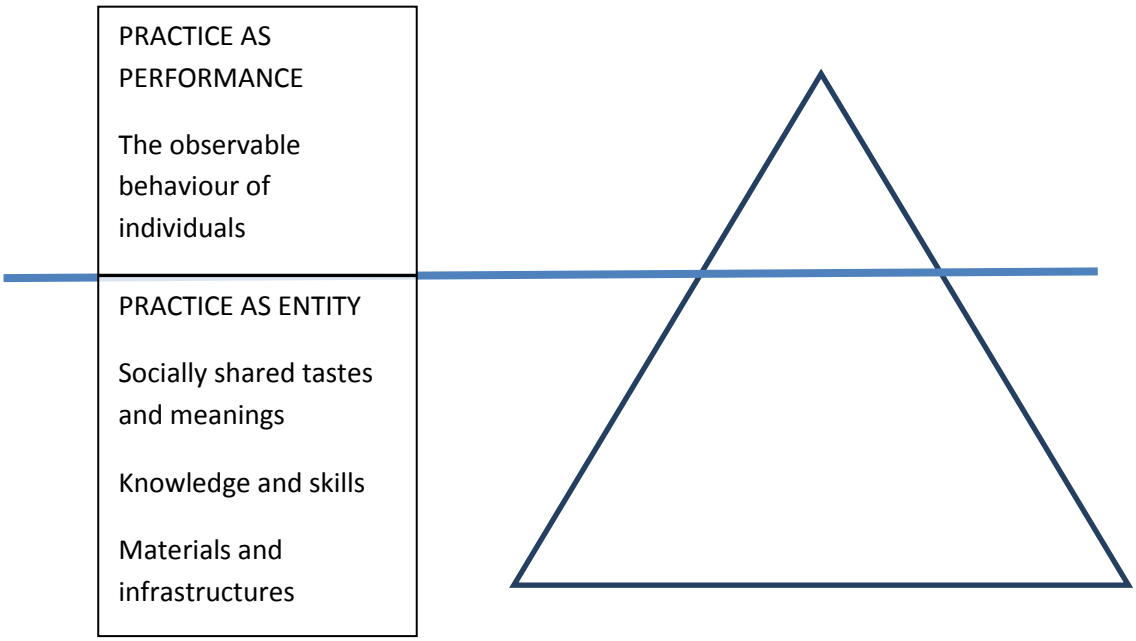


Figure 14: Individual behaviour is just the tip of the iceberg: the observable performance of socially shared practices

We suggest three ways that policy might intervene in practice-entities:

- re-crafting the elements of existing practices;
- substituting practices (new or old); and,
- changing how practices interlock.

The next section outlines some of the implications of these alternatives.

5.1 Problem framings and the scale of change

The commonly existing problem framings analysed through the case studies in this report—innovating technology, shifting consumer choice and changing behaviour—all too often represent incremental, minimal or marginal shifts at the level of practice entity. This is often due to assuming a simplistic view of the future that extrapolates from existing patterns of everyday life rather than taking account of trajectories of changing practice.

In contrast to these approaches, a practice perspective suggests, firstly, taking account of trajectories of change and working with them, and secondly, imagining the future as a 'new normal' in which currently familiar patterns of everyday life are more radically reconfigured.

Existing policy may sometimes address practices as the units of intervention – but because problems are not systematically framed from a practice perspective, they cannot fully exploit the novel opportunities that the perspective affords. For example if the problem of resource intensity arises from how practices interlock with one another then these interconnections can become the focus of intervention.

The problem framings table is a tool for policy makers which can be used in both a diagnostic and speculative manner. Diagnostically, it provides a means of systematically reviewing the co-existing problem framings currently used in a particular policy initiative, or across a whole policy area. Table 8 summarises the problem framings found in the policy documents reviewed in this report. The shadings indicate the weighting of the particular problem framing within each case study, the darker the shade the heavier the weighting.

The tool takes advantage of the fact that different styles of intervention have evolved across policy areas. The method enables these styles to be considered alongside each other, enhancing the potential for policymakers to learn from one another about intervention design and implementation. Speculatively, it provides a basis for developing future initiatives which deploy problem framings from a practice perspective, via a variety of mechanisms and at different scales.

Table 8: The weighting of the six problem framings across the cases. Darker shade represents heavier weighting.

	King Review	Food 2030	Code for sustainable homes
Innovating technology			
Shifting consumer choice			
Changing behaviour			
Re-crafting practices			
Substituting practices			
Changing how practices interlock			

In the case studies of this report we have speculated upon what the policy areas of sustainable transport, food and housing might look like in the problem framings of a practice perspective. The framework can be used to speculate on future policy proposals. In Tables 8 we speculate about weightings which those designing interventions might consider in the future, and illustrate these by drawing from the cases in this report.

Table 9: What weighting of problem framings is policy aiming for?

	Sustainable Transport Policy	Sustainable Food Policy	Sustainable Homes Policy
Innovating technology			
Shifting consumer choice			
Changing behaviour change			
Re-crafting practices			
Substituting practices			
Changing how practices interlock			

In the speculative table above:

- Sustainable transport policy focuses on substituting practices. This might include interventions explicitly aimed at substituting commuter cycling with commuter driving. It might also include research to identify other 'substitutable practices' in the realm of transport (e.g. what feasible substitutions might there be for supermarket trips by private car?)
- Sustainable food policy focuses on re-crafting and substituting practices. This might include intervening in the rhythms and conventions of eating (via institutions), such that cooked meals generally promote energy efficiency through economies of scale (e.g. in the workplace, in schools), whilst eating cold food becomes a general practice where such economies of scale do not exist. Such strategies might involve re-crafting the elements of a lunchtime and evening meal, eating hot and cold foods at different times and places, or in substituting current eating practices for alternatives e.g. eating in for eating out, 3 meals a day for multiple lighter meals.
- Sustainable homes policy draws on the whole range of framings, re-crafting practices such as laundry by removing tumble driers in addition to providing drying space, contributing to the substitution of cycling for driving through, for example the provision of cycle storage facilities, and supporting change in how practices such as driving and working interlock, through the provision of home offices.

The practice perspective problem framings are not meant to represent a hierarchy, in which the final problem framing represents systemic change whilst the other do not. Substituting practices may require radical systemic change—for example, substituting driving with other forms of mobility in a city. Re-crafting practices may also represent radical change, for example, changing elements of a practice (e.g. introducing a freezer into eating practices), may radically reconfigure that practice.

That said, addressing sets of interlocking practices may achieve scales of sustainability transition not afforded by existing problem framings. Focussing on how practices interlock also sensitises policy making to the dangers of 'rebound effects'—where sustainability gains in one area are cancelled out by unanticipated consequences in other areas.

We suggest that the scale of the sustainability challenge is such that policy should move beyond behaviour change and consumer choice, and systematically focus interventions on practices, as outlined in the three problem framings of a practice perspective.

5.2 A practice perspective

Re-crafting practices suggests systematically analysing and intervening in the components of practice to make existing practices more sustainable. We suggest that practices might be re-crafted by intervening in multiple elements of the practice at once. A practice might also be re-crafted through intervening in its temporal pattern, for example intervening in eating routines such that hot meals are eaten in workplaces at lunchtimes. We also suggest that infrastructure might be used to change how a practice is performed, for example drawing on congestion and traffic flow technologies to encourage fuel efficient driving.

Substituting practices goes a step further, to thinking about how more sustainable practices (new or old) can fulfil the same needs. Focusing on how practices such as commuter driving and commuter cycling compete for performers represents one form of substitution. Or completely new practices, such as recycling may become part of the taken-for-granted of individuals' lives, replacing older practices of waste disposal.

Finally, **changing how practices interlock** points to how changing a practice—such as food shopping— has effects on and implications for other practices — such as driving, within a wider system of interlocking practices. In this case too, intervention will change how multiple practices are performed. This framing suggests intervening in the spatial distribution and temporal organisation of practices through institutional and infrastructural arrangements.

This final framing might appear ambitious or overly optimistic. However, we have shown that practices are always changing, and that policy always imagines (and thus reinforces) *a* version of normal. Being conscious of this, and recognising how the taken-for-granted ideas of policy makers might actually limit plausible and possible change is a step forward. This does however raise questions about equality and social justice – of how and why particular practices matter to people – and the democratic legitimacy of intervening in taken-for-granted ways of life. These questions fall beyond the scope of this report.

5.3 The challenges for policy

It is likely that discussion of the problem framings will bring the challenges for policy to the foreground. Which policy areas have a hand in changing practices, and how might this work?

First, any one practice is likely to cut across different areas of policy making; intervening in practice entities and interlocking practices is likely to be piecemeal and collaborative, as illustrated by the interconnections of the 3 cases in this report.

Second, the extent or scale of a practice – the territory across which it ranges and the people, institutions and organisations involved in enacting it and keeping it alive – are unlikely to be confined to any one administrative region or even one nation state. In other words the trajectories of practices are shaped by multiple actors, some local, some very far away. There is consequently scope for thinking about precisely what different levels of policy making can and cannot do when it comes to re-crafting and substituting practices, and changing how practices interlock.

Third, as we have noted, policy makers can only intervene in processes that are already underway. Cast in these terms the task and the challenge is one of monitoring and tracking these ongoing trajectories and intervening carefully and selectively – in ways that recognise and appreciate history and context, locally and on a wider scale. This sounds reasonable, but one problem still to be overcome is that there are no obvious methods of assessing policy impact on practice, assuming that is indeed the goal. For example what might someone who aspired to change the course of a practice, or to steer practices in a more sustainable direction, need to know about current elements, practitioners and interlocking practices? How could the current practice landscape be described, and how could effect and impact on such a landscape be measured and monitored? These are not impossible questions to answer, however engaging with the problem framings seriously and systematically would require new kinds of data to be collected (the box below shows how SPRG research makes steps to address this).

The practice perspective and patterns of water use

Water policy deals in average per capita consumption per day. But actual daily per capita consumption in the UK ranges from 48 to over 1,000 litres. Water companies are trying to explain average patterns in people's water use based on values, attitudes, and behaviours. This approach routinely runs up against the value-action gap. Interventions then focus on providing technology and information to 'averaged' customers whose actual water-use is barely understood. Focusing on behaviour, such as how long you run the tap when you brush your teeth, is just the tip of the iceberg. Changing the unit of analysis from 'individuals' to 'practices' reveals that we consume water when cooking, laundering, showering, bathing, watering the garden and washing the car. Segmenting by clusters of practices (i.e. by what people actually do), not values and attitudes—opens up a wealth of possibilities for understanding water demand, and for developing new methods of forecasting and intervention for the water industry (Browne et al., 2013; Pullinger et al., 2013).

Last, but definitely not least, we have yet to consider the scale of change. Problem framings of consumer choice/behaviour change and 're-crafting practices' implicitly imagine transformations that are not very far from the present. For example, we have not yet begun to imagine the sorts of practices that might be enacted in a contemporary world without electricity or in which cars no longer function at all. These extremes are perhaps unlikely scenarios, though some technological ambitions (e.g. zero carbon supply) might be deemed equally unlikely, but the point is to raise the broader question about what 'sustainability' really means. What sorts of transformations do policy makers have in mind, and which options are beyond the pale?

These questions are in turn important for both the kinds of practices that come into view and for the timescale and socio-institutional scope of the debate. Different strategies surely follow depending on how the problem is framed. Making these framings visible is, we argue, an important and necessary step in really thinking through options and possibilities for meeting the sustainability challenge.

References

Abdel-Aty M, Dilmore J and Dhindsa A. (2006) Evaluation of variable speed limits for real-time freeway safety improvement. *Accident Analysis and Prevention* 38.

Anderson K and Bows A. (2011) Beyond 'dangerous' climate change: emission scenarios for a new world. *Philosophical Transactions of the Royal Society* 369: 20-44.

Andreasen AR. (1995) *Marketing Social Change: Changing Behaviour to Promote Health, Social Development and the Environment.,* San Fransisco: Jossey Bass Publishers.

Bennett T, Savage M, Silva E, et al. (2009) *Culture, Class, Distinction,* London: Routledge.

Browne AL, Medd W and Anderson B. (2013) Developing Novel Approaches to Tracking Domestic Water Demand Under Uncertainty - A Reflection on the 'Up Scaling' of Social Science Approaches in the United Kingdwom. *Water Resources Management* 27: 1013-1036.

Byrkjeflot H, Pedersen JS and Svejenove S. (2013) From Label to Practice: The process of creating New Nordic Cuisine. *Journal of Culinary Science and Technology* 11: 36-55.

Cairncross F. (1997) *The Death of Distance: How the Communications Revolution will Change our Lives*: Harvard Business Press.

Chappells H and Shove E. (1999) The dustbin: A study of domestic waste, household practices and utility services. *International Planning Studies* 4: 267-280.

Cheng SL, Olsen W, Southerton D, et al. (2007) The changing practice of eating: evidence from UK time diaries, 1975-2000. *British Journal of Sociology* 58: 39-61.

Comte S, Wardman M and Whelan G. (2000) Drivers' acceptance of automatic speed limiters: implications for policy and implementation. *Transport Policy* 7: 259-267.

Darnton A. (2004) *The Impact of Sustainable Development on Public Behaviour: Report 1 of Desk Research commissioned by COI on behalf of DEFRA*. Available at: http://collection.europarchive.org/tna/20080530153425/http:/www.sustainable-development.gov.uk/publications/pdf/desk-research1.pdf.

Defra. (2010) *Food2030*. Available at: http://archive.defra.gov.uk/foodfarm/food/pdf/food2030strategy.pdf.

Department for Communities and Local Government. (2010) *Code for Sustainable Homes: technical guide*. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/5976/code_for_sustainable_homes_techguide.pdf.

Derek Halden Consultancy. (2003) *Barriers to Modal Shift*. Available at: http://www.scotland.gov.uk/Publications/2003/09/18178/26361.

Dolan P, Hallsworth M, Halpern D, et al. (2010) Influencing behaviour through public policy.

Edwards JB. (2002) Motorway speeds in wet weather: the comparative influence of porous and conventional asphalt surfacings. *Journal of Transport Geography* 10: 303-311.

Gronow J and Warde A. (2001) Ordinary Consumption. London: Routledge.

Hand M, Shove E and Southerton D. (2005) Explaining Showering: a Discussion of the Material, Conventional, and Temporal Dimensions of Practice. *Sociological Research Online* 10.

Hobson K. (2003) Thinking habits into action: the role of knowledge and process in questionning household consumption practices. *Local Environment* 8: 95-112.

House of Lords Science and Technology Select Committee. (2011) *Behaviour Change*. Available at: http://www.publications.parliament.uk/pa/ld201012/ldselect/ldsctech/179/179.pdf.

Hugh-Jones EB. (1949) *Safety as a factor in road design, construction & layout,* London: Town Planning Institute.

Hui A. (2013) Practices, movement and circulation: implications for sustainability. In: Shove E and Spurling N (eds) *Sustainable practice: social theory and climate change.* Taylor and Francis.

Jackson T. (2009) *Prosperity Without Growth: Economics for a finite planet,* London, Washington DC: Earthscan.

King J. (2007) The King Review of low-carbon cars. Part I: the potential for CO2 reduction. HM Treasury.

King J. (2008) The King Review of low-carbon cars. Part II: recommendations for action. HM Treasury.
Le Vine S and Jones P. (2012) On the Move: Making sense of car and train travel trends in Britain. London: RAC Foundation.
Long S, Gentry L and Bham GH. (2012) Driver perceptions and sources of user dissatisfaction in the implementation of variable speed limit systems. *Transport Policy* 23: 1-7.
McKenzie-Mohr D. (2000) Promoting Sustainable Behavior: an introduction to community-based social marketing. *Journal of Social Issues* 56: 543-554.
Mitchell J. (1999) The British Main Meal in the 1990s: Has it Changed its Identity. *British Food Journal* 101: 871-883.
Mithril C, Dragsted LO, Blauert E, et al. (2012) Guidelines for the New Nordic Diet. *Public Health Nutrition* 15: 1941-1947.
Nilsson G. (1991) Speed limits, enforcement and other factors influencing speed. In: Koornstra MJ and Christensen J (eds) *Proceedings of the International Road Safety Symposium: Enforcement and Rewarding: Strategies and Effects. .* Copenhagen, Denmark: SWOV Institue for Road Safety Research, Leidschendam.
Office of National Statistics. (2002) The National Diet & Nutrition Survey.
Papgeorgiou M, Kosmatopoulos E and Papmichail I. (2008) Effects of variable speed limits on motorway traffic flow. *Transportation Research Record: Journal of the Transportation Research Board* 2047: 37-48.
Parker Morris P. (1961) Homes for today and tomorrow: report of a Sub-committee ofthe Central Housing Advisory Committee. Great Britain Ministry of Housing and Local Government.
Pullinger M, Browne A, Anderson B, et al. (2013) Patterns of Water: The water related practices of households in southern England and their influence on water consumption and demand management: Final Report of the ARCC Water/ SPRG Patterns of Water projects.
Shove E. (2003) *Comfort, Cleanliness and Convenience: The Social Organization of Normality,* Oxford, New York: Berg.
Shove E. (2010) Beyond the ABC: climate change policy and theories of social change. *Environment and Planning A* 42: 1273-1285.
Shove E, Pantzar M and Watson M. (2012) *The dynamics of social practice: everyday life and how it changes,* London: Sage.
Shove E and Southerton D. (2000) Defrosting the Freezer: From Novelty to Convenience. *Journal of Material Culture* 5: 301-319.
Shove E, Trentmann F and Wilk R. (2009) Time, Consumption and Everyday Life: Practice, Materiality and Culture. Oxford: Berg.
Shove E and Walker G. (2010) Governing transitions in the sustainability of everyday life. *Research Policy* 39: 471-476.
Shove E and Warde A. (2002) Inconspicuous consumption: the sociology of consumption, lifestyles and the environment. In: Dunlap R, Buttel F, Dickens p, et al. (eds) *Sociological Theory and the Environment: Classic Foundations, Contemporary Insights.* Lanham, MA: Rowman and Littlefield.
Southerton D. (2006) Analysing the temporal organisation of daily life: social constraints, practices and their allocation. *Sociology* 40: 435-454.
Southerton D. (2009) Temporal rhythms: comparing daily lives of 1937 with those of 2000 in the UK. In: Shove E, Trentmann F and Wilk R (eds) *Time, Consumption and Everyday Life: Practice, Materiality and Culture.* Oxford: Berg, 49-63.
Southerton D, McMeekin A and Evans D. (2011) International Review of Behaviour Change Inititiatives.
Stern N. (2006) *The Economics of Climate Change: The Stern Review,* Cambridge: Cambridge University Press.
Sustainable Development Commission. (2006) *I Will if you Will: towards sustainable consumption*. Available at: www.sd-commission.org.uk/publications.php?id=367.

Thaler RH and Sunstein CR. (2008) *Nudge: Improving decisions about health, wealth and happiness,* Yale: Yale University Press.
Urry J. (2007) *Mobilities,* Cambridge: Polity.
Warde A. (2005) Consumption and theories of practice. *Journal of Consumer Culture* 5: 131-153.
Warde A. (2011) The Power of Nudge: Persuading Citizens. *Food Ethics* 6.
Watson M. (2012) How theories of practice can inform transition to a decarbonised transport system. *Journal of Transport Geography* 24: 488-496.
Zero Carbon Hub and Energy Saving Trust. (2010) Marketing Tomorrow's New Homes: Raising Consumer Demand for Low and Zero Carbon Living.