Social and Behavioural Aspects of Climate Change

Background Paper No. 3

Final Report from the NESC Secretariat:

Ireland's Climate Change Challenge*:*
Connecting 'How Much' with 'How To'

Dr Jeanne Moore

December 2012

An Chomhairle Náisiúnta Eacnamaíoch agus Shóisialta
National Economic & Social Council
NESC

Table of Contents

Executive Summary

Aim of Paper

Moving towards a carbon-neutral society will require social and behavioural change and yet there has been little examination in Ireland about how this could be achieved. This paper sets out some current thinking and provides a unique review of the social and behavioural literature in relation to Ireland's climate change challenge. It examines key areas of policy and practice where social and behaviour change strategies have been used to good effect. These areas are energy efficiency; travel behaviour; social acceptance of energy infrastructure: farming practice and societal engagement. In addition some longer term perspectives on transitioning are considered.

Why Focus on Behaviour Change?

While it has been underplayed to date in climate policy, behaviour change is becoming more central to international debates and may represent a 'holy grail' for policy makers. There is extensive research and practice which shows that understanding social and behaviour aspects can be a low cost and effective strategy to reducing emissions. At the same time, there are many co-benefits of a carbon-neutral society including public health, increased energy security, cost savings for households, potential job creation and better social cohesion and quality of life.

However, changing behaviour is neither automatic or predictable. To be effective, social and behavioural approaches need to have an impact in the long-term (thus changing habits and values) and involve not only individuals but systems and social practices across all levels of society. Ultimately, the transition towards a carbon-neutral society is a societal project—people have to be engaged, informed, be willing to participate and change their behaviour for climate-change mitigation to take place.

Where attitudes or behaviour have been a policy focus, there has been a tendency to adopt an information deficit model, with the assumption that the right information will bring about a change in attitudes and eventually, the desired behaviour change. Individuals do not always respond rationally to favourable economic choices or behave more sustainably, despite having positive attitudes, a finding that has been well documented by behavioural economists, psychologists and other social scientists.

Key Enablers to Changing Behaviour

While much of the research evidence relates to specific areas of behaviour change such as energy efficiency and travel, there are some general enablers for behaviour change strategies relevant to climate change in the short to medium term which include:

- Remove barriers: make it available, affordable and accessible;
- Social norms are key: the social context and social system are important to consider, not just individual behaviour change;
- Make it attractive: incentivise and reward a change in behaviour;
- Target: key lifestyle moments such as moving house, particular sectors or communities; and
- Adopt a mixed approach: different levers such as incentives, regulation and public benefits.

Practices and Behaviours Within Key Sectors

Energy Efficiency

Energy use needs to be made more visible so that consumers can gain feedback on what they are using. Social and behavioural insights can be used to change how energy is used in homes, offices and across the public sector. These include showing people what they can do to change, give them an incentive (often to save money), reduce upfront costs and provide feedback on energy use. In relation to retrofit, a key strategy for saving energy, some important factors include: removing the hassle factor, reducing the inconvenience and uncertainty, removing upfront costs and giving feedback. It is clear that while individual energy efficiency is important, long-term change has to come from systems change.

Social Acceptance of Energy Infrastructure

The development of renewable energies in Ireland is likely to be a key part of Ireland's transition to a carbon-neutral society. This will necessitate the development of wind farms and electrical infrastructure on a larger scale than previously known. It is therefore important that local communities are both aware and prepared to engage and even benefit from these developments. The research and practice outlined in Chapter 3 suggests ways for this to be encouraged.

Travel Behaviour

Why someone adopts a particular set of travel habits is deeply rooted in social and institutional contexts, so it is valuable to look both at barriers and enablers at an individual level, but also at social practices (such as driving) at a societal level. Targeting, tailoring solutions and working with communities to build transport solutions and strategies from the bottom up may be effective. While there are real barriers to modal shift away from the car such as a lack of viable alternatives in rural areas, there are effective strategies to encourage more cycling and walking, often through a combination of increased information, incentives, peer/community support and appreciating the potential co-benefits such as getting fit. Key social and behavioural supports to eco-driving and EV's are outlined in Chapter 4.

Farming Practice

There is considerable scope for the use of social and behavioural evidence and practice to support changing farming practice. Understanding that such practices are shaped by social, cultural and geographic contexts such local ways of doing things, demographics and farming traditions is important for long-term change. Barriers to changing practices are outlined, which include social and cultural factors, habits and routines, practical and financial and attitudinal. The international evidence is that farming practice has a key role to play in climate-change action and that behaviour change is not a one by one persuasion task but a social challenge. Forming networks of farmers, focusing on the local level, and adopting a holistic approach are some suggested strategies.

Understanding Long Run-Transition

In seeking to understand how current action may shape future options for a carbon-neutral society, a useful approach is to consider transitioning as a path of development based on new practices, knowledge, social organisation and different guiding principles. Such a transition involves fundamental social, technical, political and institutional change. Drawing also on previous work on innovation and learning suggest three areas have value in thinking about long-run transition (NESDO, 2009):

i) Learning and review, in which expert knowledge is combined with 'learning by doing' and systematic review on ways of improving and changing practices;

ii) New forms of governance including a key roles for networks and agency which includes reflexive governance, experimentation with regular review, long term vision combined with medium term actions and interaction with key stakeholders, communicating with the public to gain support; and

iii) Action across all levels of society including institutional, inter-personal and personal bringing new forms of cross-fertilisation between the economy, society and public governance, enhancing the ability to learn and innovate and recognising the key role of changing behaviour and social practices in a transition. Diffusion of innovation may work best by targeting key sectors as early adopters.

Societal Engagement

i) Achieving a policy vision for a carbon-neutral society will require support from all sectors including business, householders, community organisations and voluntary groups. Climate change is confronting companies and organisations with new risks and challenges and Chapter 7 outlines some examples of increased carbon accounting and capability—that is, understanding and monitoring carbon in everyday life and seeking to reduce emissions, such as Celtic Linen, the Carbon Disclosure Project, Business in the Community, Glanbia, Origin Green, Green Schools, SEAI Sustainable Energy Communities and Kilbarrack Fire Station.

ii) A key role for governance in a low-carbon transition is to make a low-carbon society, and its social and economic advantages, 'real' for people. Encouraging greater engagement can take the form of raising awareness, environmental education, increased participation in environmental decisions, and direct involvement in local climate action.

Conclusion

The paper shows that, with an emphasis on placing particular behaviours within their social, cultural and technological contexts, there is a shift away from a purely economic model of consumer choice, to one which recognises that long-lasting behaviour change needs to occur across all levels, involving institutional, technological change as well as a shift in social practices and norms. The key message of this paper is that a widening and deepening is required in understanding behaviour change—widening in the sense of moving beyond the individual to shared practices, habits and routines- and deepening, in that it is necessary to get under the skin of attitudes, to deeper motivations and values, for long-lasting change.

Taking social and behavioural aspects seriously will help to support greater community engagement, more effective policy making, targeted measures and practices. It would be valuable to build an Irish skill-base and set of perspectives on the social and behavioural aspects of climate change and low-carbon living.

General Approach to Behaviour Change

Chapter 1: Understanding Behaviour Change

1.1 Introduction

Aim of this Paper

While social and behaviour change is recognised as being central to any effective response to climate-change mitigation and adaptation, there has been relatively little consideration as to how this might be achieved. This is not surprising given the complexity of both climate and behaviour change. While in the UK, the Stern review emphasised the removal of barriers to behavioural change as one of three required policy elements for climate change, (Stern, N., 2006), it has taken some time for these to be tackled directly. More generally, much of the evidence cited in the social science literature has not translated readily to policy thinking internationally. However, there is an emerging view that the policy system needs to do more to embrace the complexity of what drives action and inaction (OECD, 2008). At EU level, increased emphasis is being placed on examining key aspects of behaviour change that can be applied to energy use and useful principles and practices identified.

Within the reframing of the climate-change problem for Ireland, NESC has identified social and behavioural change as one key element to be considered more directly. This paper sets out some current thinking and provides a unique review of the social and behavioural literature in relation to Ireland's climate change challenge. Given the Terms of Reference of the NESC project on Climate Change for the Department of the Environment, Community and Local Government, the focus of our enquiry was on mitigation strategies for 2020 and the transition to a low-carbon economy. The social and behavioural aspects of these particular challenges (such as energy efficiency, agriculture, transport) formed the basis of our work in this area.[1] With this lens, this background paper provides a pragmatic examination of key material, and is not intended to represent an exhaustive review, given the depth and scale of the international literature. Readers interested in more comprehensive accounts are directed to these sources (Southerton *et al.*, 2011) (American Psychological Association, 2011). This paper should be considered in the context of adding value

[1] There is a separate literature on the psychology of adaptation, which this paper does not examine, including a focus on building community resilience, see for example (American Psychological Association, 2011).

and increasing the effectiveness of other key approaches to climate action, as outlined in our Interim and Final reports.[2]

Key Arguments Made in This Paper

- There is a diversity of international evidence on environmental behaviour change (in environmental psychology, sociology, psychology, behavioural economics), with different areas of focus in relation to policy (design, implementation, evaluation) and communication, and applied to particular sectors such as: transport, energy efficiency and farming.
- To date, little of it has found its way into Irish policy. Applying research evidence to policy requires both skill and application, but also time for reflection, analysis and evaluation. Other countries are taking it seriously, given its critical role in climate action. For example, England and Scotland have placed a strong focus on behaviour change in recent years in their action on climate change and in relation to other complex policy challenges. In doing so, there is a recognition that behaviour change is, even if achieved, often incremental rather than radical in the reductions in emissions achieved.
- Where attitudes or behaviour have been a focus, there has been a tendency to adopt an information deficit model, with the assumption that the right information will bring about a change in attitudes and eventually, the desired behaviour change. Individuals do not always respond rationally to favourable economic choices or behave more sustainably, despite having positive attitudes, a finding that has been well documented by behavioural economists, psychologists and other social scientists.
- There is no doubt that behaviour change is complex and hard to achieve. To be effective, social and behavioural approaches need to have an impact in the long-term (thus changing habits and values) and involve not only individuals but systems and social practices across all levels of society. Ultimately, the transition towards a carbon-neutral society is a societal project—people have to be engaged, informed, be willing to participate and change their behaviour for climate-change mitigation to take place.
- While it has been underplayed, behaviour change is becoming more central to debates and may represent a 'holy grail' for policy makers. There is extensive research and practice which shows that understanding social and behaviour aspects can be a low cost and effective strategy to reducing emissions.

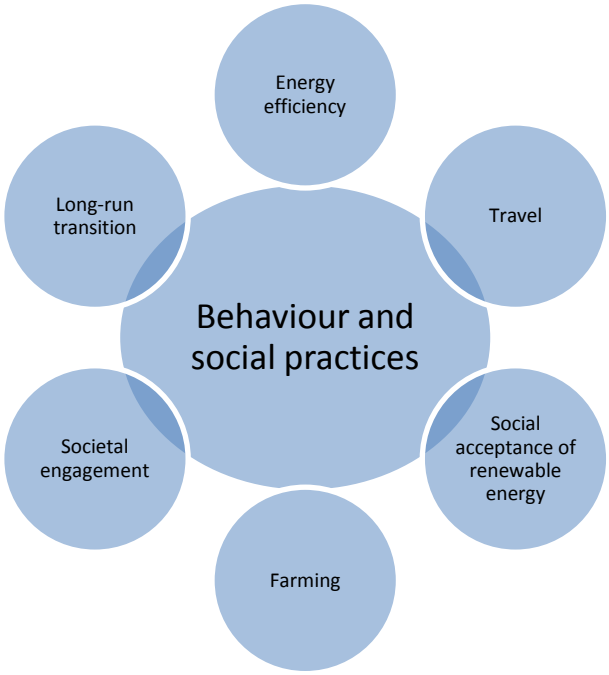
[2] Please see our Final Report for acknowledgements, abbreviations and a glossary of terms.

- The key message of this paper is that a widening and deepening is required in understanding behaviour change—widening in the sense of moving beyond the individual to shared practices, habits and routines- and deepening, in that it is necessary to get under the skin of attitudes, to deeper motivations and values, for long-lasting change.

Structure of Background Paper

This paper is structured as follows. The rest of this chapter will address the question often raised, which is why behaviour change is so important and yet hard to achieve, and asks is it the 'holy grail' of climate change? It will outline some of the approaches to date on behaviour change, drawn from behavioural economics, social marketing, sociological perspectives and social practices. It draws from the attitudinal, behaviour and choice literature (ABC) which has increasingly been used in this area, but marries this with a more sociological perspective. It concludes with a brief overview of some key enablers and barriers to behaviour change. The following chapters examine key social and behavioural aspects of specific areas of particular interest for mitigation action including: energy efficiency, social acceptance of renewable energy, travel behaviour and farming practice. The next chapter provides a longer-term focus, outlining some of the literature on transitions and new forms of governance, followed by a chapter on societal engagement. The final chapter presents some general conclusions, pointing to the value of the social and behavioural research and practice cited here and the practical applications within an Irish context. Figure 1.1 illustrates the scope of the work outlined here.

Figure 1.1 Social and Behavioural Aspects in Focus



1.2 Behaviour Change

Is Behaviour Change the 'Holy Grail' of Climate Change?

To understand this 'how to change behaviour' question, policy makers across Europe and the US have been seeking behavioural answers to help explain market failure or to identify salient factors for more effective implementation. It has been argued that behaviour change is 'becoming a kind of "holy grail" for sustainable development policy' (Jackson, 2005: 94). A vast and diverse literature is emerging, drawing from research which includes a focus on consumer behaviour, attitudes, values and well as social practices.

It has been argued that changing behaviour in households, referred to as 'the behavioural wedge' is a low-cost under-utilised strategy that could be successful if implemented effectively, drawing on research evidence (Vandenbergh *et al.*, 2010). A recent European Commission report outlines how 'changes in behaviour of households and consumers can result in large reductions of greenhouse gas (GHG) emissions in the EU, both in the shorter and in the long term' (Faber *et al.*, 2012). The report concludes that across heating, transport, food and housing, there are options for behaviour change that could result in a decrease of GHG emissions.

> The eleven measures identified and studied in detail could, if implemented by all the households and/or consumers which can reasonably be expected to be able to do so, impact on EU GHG emission mitigation potentials in the range of 22 Mt CO_2 in 2020 (a reduction of space heating temperature by 1°C) to more than 250 Mt CO_2 in 2020 (a shift to a vegetarian diet) (Faber *et al.*, 2012: 7).

However, they note these face a range of barriers which include: buying an electric car; teleworking; virtual meetings; acceptance of reduced room temperatures and changing to a healthy diet.

While useful for current mitigation policy challenges, such analysis does less to respond to the complexities of achieving long-term behaviour change. Policy makers are turning to behavioural economics and social psychology to identify key salient messages and approaches that will be effective for long-term behaviour change. One popular approach developed by Sunstein and Thaler is the 'nudge' as a 'helping hand' leading someone to do something. 'Choice architects' then try to influence people's behaviour in order to make their lives longer, healthier, and better' (Sunstein & Thaler, 2008: 5).[3] In England, the Behavioural Insights Team in the Cabinet Office, is

[3] However, as a House of Lords Science and Technology sub-committee report in England demonstrated, simplistic attempts to 'nudge' people towards the right behaviours in the absence of a coherent package of regulation and fiscal measures are not effective. http://www.theccc.org.uk/news/features/1071-profile-on-david-hall-director-at-behaviour-change

drawing from this research among a wide range of other social science evidence and practice and conducting randomised control trials on a range of policy areas, focusing on behaviour change. For example, they found that offering home owners a loft-clearance service can increase the odds of installing loft insulation by over a factor of 4. Reducing the hassle-factor can be as or more effective than financial incentives (Behavioural Insights Team, 2012).

Measures to reduce carbon emissions often rely on a change in behaviour to be successful, however such change is complex, context-dependent, variable from social groups and over time, and hard to predict and if achieved, often at a small level and short-lived. Changing behaviour is neither automatic or predictable (Sheppard, 2011: 9). A 'value-action gap' exists between how people think they should behave and their actual behaviour (Blake, 1999). Even with pro-environmental attitudes, people may not always change their behaviour or take up rational choices. Facilitating conditions have far greater influence on many behaviours than values and attitudes, but attitudes are often the focus of government work internationally (The Scottish Government, 2010).

There is an assumption that short term gains (in energy efficiency, pro-environmental behaviour or modal transport shifts) will be sufficient to meet policy objectives for climate action. While in Ireland we are fast to adapt at times (e.g. recycling or use of non-plastic bags), sustained behaviour change requires a multi-pronged approach to be successful. As the OECD have argued, 'the environmental outcome of policy instruments is usually much lower than their potential due to institutional, educational, social and political constraints' and 'behavioural factors influence the outcome of policy incentives in that they can either complement or constrain the effects of policies'(OECD, 2012: 7). Nevertheless, large-scale behaviour change is possible and has been achieved across a wide range of other areas, e.g. smoking, seat belt use, safety helmets, and recycling, for example (Vandenbergh *et al.*, 2010).

In broad terms, the focus in Ireland of social and behavioural aspects of climate change to date has been limited and been focused mostly on promoting awareness, providing information and changing attitudes. *Change* is the current national awareness and communication campaign, led by DECLG, which aims to engage with individuals and sectors to encourage and support positive changes. The dedicated website includes a personal carbon calculator to enable individuals to calculate their carbon number and make positive changes to reduce it[4]. Other awareness campaigns have also been used such as *Race Against Waste and* SEAI's campaign the *Power of One*. However, without the considerable resources required for advertising

[4] www.change.ie

campaigns to raise awareness, the use of other social and behavioural approaches might be more effective. In addition, as discussed below, raising awareness is not the same as changing behaviour. Awareness raising can be effective when targeted to specific groups and when more interactive. As outlined the *Change* initiative also included the creation of an enquiry-based, cross-curricular educational resource, Eco-Detectives. These were developed for the initiative by the Centre for Human Rights and Citizenship Education, St Patrick's College and distributed to all primary schools in Ireland (Kavanagh *et al.*, 2012, Pike, 2011).

The EPA have drawn on behaviour change approaches in their funding of research, such as the Consensus project (discussed in Chapter 2), barriers to sustainable transport (Browne *et al.*, 2011) and their waste prevention programme. They reinforced this message at the launch of a report on *Ireland's Greenhouse Gas Emissions in 2011*:

> Changing behavioural patterns can provide a key means to reduce emissions provided the appropriate incentives, such as taxation, regulation, investment and information, are provided. Using resources more efficiently, travelling less by car and reducing household consumption are all areas that can make a difference (Cotter, 2012).

How Important are Attitudes to Behaviour Change?

Often the first area of focus in relation to behaviour change are people's attitudes. Positive environmental attitudes and a strong awareness of climate change can help achieve support for policy measures. In this regard, Irish people are already concerned about climate change and consider it to be one of the world's most serious problems. A special Eurobarometer on climate change found that on a scale of 1 (least) to 10 (most), Irish respondents ranked the seriousness of climate change at 7.0 (7.1 EU average) (European Commission, 2011a).

Two thirds of Irish people (66 per cent) reported taking action to fight climate change in last six months as compared with 53 per cent on average across the EU . In terms of the action noted, most, 79 per cent referred to recycling, 62 per cent to cutting down on consumption (e.g. use of plastic bags), 34 per cent buying local/seasonal produce and 28 per cent home insulation.

A high percentage, 78 per cent, of Irish respondents thought that fighting climate change and using energy more efficiently can boost the economy and jobs in the EU (same as EU average). Some 60 per cent think we will be using energy more efficiently in 2050 than we do now (considerably higher than the 45 per cent EU average).

However, a singular emphasis on attitudes has been critiqued as being part of the dominant 'ABC' model prevalent in climate change, also known as the 'information deficit' model. In this, social change is thought to depend on values and attitudes (A), which are believed to drive the kinds of behaviour (B), that individuals choose to adopt (C), (Shove, 2010). The 'ABC' Model can be effective in changing attitudes and, to a lesser extent, behaviour, but it is limited because it fails to take into account individual, social and institutional constraints (Blake, 1999), or habits and social norms (Jackson, 2005). More profoundly, it does not recognise the social embeddedness of decision-making, in which individual choices are continually being shaped and reshaped by the social contexts in which they take place (Moloney *et al.*, 2010: 7616). It also fails to recognise how people become 'locked' into specific behaviour patterns through institutional factors outside their control (Jackson, 2005). Pro-environmental behaviour is also determined by the complex interplay of many other factors, such as time, convenience and comfort (Lavelle & Fahy, 2012). The dominant approach falls short because there is no simple relationship between attitudes, engagement and behaviour change (Upham *et al.*, 2009).

Environmental attitudes have been found to have a varying, usually very small impact on pro-environmental behaviour. This is unexpected because we tend to assume that people live according to their values (Kollmuss & Agyeman, 2002: 252). In this way, increased climate-change awareness or positive attitudes do not necessarily lead to increased energy efficiency behaviour. For example, an evaluation of the SEAI *Power of One* campaign by the ESRI to determine the campaign's effect on residential gas consumption showed that ithad increased self-reported interest in energy efficiency and awareness of behaviours that curb natural gas consumption. Evaluations show that 'recall and recognition levels of the brand amongst Irish energy consumers is very high. The key message is clearly understood and felt to be highly relevant' (Department of Communications Energy and Natural Resources, 2008: 5). However, the authors failed to find any positive effect of the campaign on self-reported energy-saving behaviours.

Targeting the Household

The household is a growing unit of analysis in relation to climate change (Davies, 2009). By including all energy use under this social group (including personal transport) considerably higher proportion of emission reduction potential comes into view. However, there has been a lack of mitigation action directed at the household and behaviour change.

Vandenbergh *et al.* argue that the principal barrier to a lack of policy focus in this area is conceptual—widespread misconceptions about the potential emissions reductions from the household sector (Vandenbergh *et al.*, 2010). If energy

efficiency and personal transport are combined through a reframing of actors, households emerge as the largest sector, representing one third of carbon emissions in the United States (De Serres *et al.*, 2011: 10549). Laitner *et al.* (2009) argue that changed patterns of behaviours might reduce household use of energy by 22 percent within the United States. Indeed, a greater understanding of behaviour, and an improved categorisation of behavioural responses might expand that potential magnitude of savings.

However households and individuals are highly interdependent on wider social practices, norms and cultures. Social processes are also critical to the widespread, sustained adoption of pro-environmental behaviours (Behavioural Insights Team, 2011: 11).

A further misconception about the household is that it is considered a matter of private or household interest. However, public laws and policies are often needed to overcome these barriers (De Serres *et al.*, 2011). Finally, there are concerns that governments are incapable of developing and implementing the measures necessary to achieve widespread behaviour change, but there is considerable evidence available now which can support such action (Vandenbergh *et al.*, 2010: 10550).

'Doing Things Differently' –The Role of Social Practices

A successful transition to a carbon-neutral society will require social and behavioural change (Jackson, 2005, Moloney *et al.*, 2010). There is broad consensus that moving towards such a society involves 'enough people doing things differently' (Watson, 2012).

This requires a focus on *how* we can do things differently as well as the *what* and *when*. In the short term, social and behavioural research evidence can help inform the design, application and evaluation of mitigation policies and measures, such as home energy efficiency schemes and transport initiatives to encourage modal shift. These further benefit from evidence to develop effective communication and engender support for such policy measures. In the longer term, to achieve a successful transition to a carbon-neutral society, such evidence and practice could help reframe how energy is used and discussed.

As a leading sociologist helping to reframe the debate on behaviour change in the UK, Shove argues,

> changing the terms in which problems are cast is also vital: however subtle, switching language matters. Simple pedagogic techniques, like talking about the services energy makes possible—cooking, lighting, heating and cooling—and not 'energy' itself, turns attention to the histories and trajectories of what people

> do, locating this not as an outcome of individual choice but as part and parcel of a much more extensive process of socio-technical change (Shove, 2003).

Moloney *et al.* also argue,

> the problem of human behaviour which leads to emissions needs to be placed within the wider contexts where social practices are undertaken. Norms and values shape practices, and so do infrastructures, institutional arrangements and systems of governance (Moloney *et al.*, 2010: 2).

Behaviour change then becomes not a one-by-one persuasion task, but a social challenge (Vanclay, 2004: 17) which includes institutional and landscape change, as well as more individually-focused efforts. Social practices involve *materials*—including things, technologies, tangible physical entities, and the stuff of which objects are made; *competences*—which encompasses skill, know-how and technique; and *meanings* –including symbolic meanings, ideas and aspirations (Shove *et al.*, 2012). While social practices are resilient, change can occur, triggered at both the individual level by new ideas and behaviour, but also through interaction or a change in the material elements (new technology). In this way, transitioning involves transformation of a suite of transforming and intersecting social practices constituted by understandings, practical skills, rules and things (Strengers, 2012: 233).

Changing the way we do things requires particular pro-environmental practices to become routine and embedded in society e.g. recycling is widely practiced in Ireland today with supporting infrastructure and social rules, daily practices and skills and broad understanding as to its value. A focus on such habits and practices will be necessary as part of the transition to a carbon-neutral economy and society. Nye *et al.* (2010) explore what an energy-system transition would involve (using a social practice approach):

> For most individuals, ongoing energy-consumption behaviour is an integral and `unthinking' part of the enactment of everyday life. The bulk of domestic energy consumption stems from unconscious, habitual behaviour that is wrapped up in everyday habits or routines and the maintenance of a lifestyle. Thus, to the extent that domestic actors can play an active role in the transition to a lower carbon economy, a sizeable portion of that role will likely involve overcoming and replacing unsustainable energy-using habits and routines, and redefining the conventional and normative rules/expectations for energy use in everyday life (Nye *et al.*, 2010: 705).

One potentially useful way forward is the development of 'communities of practice' which bring together key actors to consider elements of practice from which sustainable practices could be made and which seek to break the ties that hold other less sustainable arrangements in place (Shove *et al.*, 2012: 161).

While 'doing things differently' is important to achieve long-term and strategic change, this does not solely apply to individuals but all sectors of society. In particular, governments play a key leadership role in climate action and behaviour change, particularly across public services and departments (The Scottish Government, 2010).

The following section outlines some of the many approaches to behaviour change used in relation to climate change and energy use, which includes a focus on individual behaviours and households as well as wider practices and systems.

1.3 Practical Insights and Approaches

Contexts and Barriers

It is helpful to consider the different areas of focus in behaviour change. Effective, long-lasting change is hard won, but key seems to be a combination across all three levels from the individual, the social to the structural. Context is not a static condition, either hampering or facilitating change: different elements change over time (Mourik *et al.*, 2009). However it is important to address at least one context in which behaviour might be changed. There are enablers and barriers across these levels. Willingness to change behaviour (e.g. modes of travel) is limited by perceived personal, social and structural barriers (Upham *et al.*, 2009).

Table 1.1 presents these levels and examples of potential barriers to behaviour change.

Table 1.1 Levels and Barriers

Levels	Includes	Examples of Barriers
Individual	Attitudes and behaviour	Uncertainty and scepticism, lack of knowledge, reluctance to change lifestyles, financial, convenience, psychological distance, habits, beliefs, lack of agency including control and self-efficacy
Social	Social norms, cultural conventions and shared understandings and social systems	Free rider effect, strong social norms, commitment and consistency
Structural/material/cultural	Objects, technologies and infrastructures that both enable and constrain ways of behaving	Lack of infrastructure/enabling supports, traditions, political system

Source: (Southerton *et al.*, 2011, Winefield, 2005).

Enablers

Some key enablers/supports of behaviour change have been identified from behavioural economics, community based social marketing and other approaches. However, there is no single critical failure or success factor; many are not isolated issues, but inter-related (Mourik *et al.*, 2009). The following sections draw from a range of sources[5] to identify some of the key enablers for behaviour change in the short to medium term. Key aspects include:

- Remove Barriers;
- Social Norms are Key;
- Make it attractive;
- Target; and
- Adopt a Mixed Approach.

i) Remove Barriers: Make it Available, Affordable and Accessible

- Information and education play an important but not sufficient role in changing behaviour. In terms of information, this should be kept simple and convenient, with a clear focus.
- Increased awareness of the environmental impacts of consumer choices can help increase energy efficiency behaviour as well as increase the acceptability of policies, facilitating their implementation.
- Raising environmental awareness on specific behaviour areas (e.g. eco-driving) can be effective.
- Credible information should be available at points of decision for consumers.
- One useful approach is the 4 Es approach (The Department of the Environment Food and Rural Affairs, 2005) which includes:
- Enable (e.g. remove barriers to motivation and action, give information and best practice, provide capacity);
- Engage (use networks, encourage community participation);
- Encourage (adjust tax system, offer grants, impose penalties), engage (develop co-production, use networks); and

[5] (Centre for Research on Environmental Decisions, 2012) (Heiskanen *et al.*, 2010) (Halpern, 2012) (McKenzie-Mohr, 2000) (OECD, 2011) (Mourik *et al.*, 2009) (Vandenbergh *et al.*, 2010) (Southerton *et al.*, 2011) (The Scottish Government, 2010) (OECD, 2008) (Stern, P., 2011).

- Exemplify (lead by example, achieving consistency in policy). Critics point to the need for regulatory and infrastructural changes too (i.e. Enforce).
- Changing the defaults (in energy use) to more sustainable ones can be effective e.g. lower thermostat levels as people tend to stick with automatic options.
- Removing structural barriers is important, for example, providing recycling collection services.
- Building capacity is valuable: make sustainable choices available, affordable and desirable by increasing individuals' capacity to know about them, access them or create them (Winefield, 2005: 12). This underlies the importance of education-knowing the environmental impact of behaviour, awareness of alternatives.

ii) Social Norms are Key

- The social context and social system are important to consider, not just individual behaviour change. Engaging people as members of a community, not just as consumers of energy, is an important strategy for changing behaviour.
- Feedback plays a key role in behaviour change—particularly on energy use-including feedback which compares use with that of peers, neighbours, social networks. It works well when combined with focused goals and commitments to act. People are influenced by what others are doing so behaviour change can often be group-led.
- Encouraging group participation to develop social norms can be effective.
- It can be useful to fit the new behaviour/practice into everyday rules, practices and habits as more likely to gain traction.
- Create networks that support new practices.

ii) Make it Attractive

- Incentives are useful in supporting behaviour change, particularly when they are immediate. People often have a tendency to 'discount the future'—in other words, they may prefer a smaller reward today over a larger reward in the future.
- Incentives do not have to be financial to have an impact. They can also include adding value or status to a new practice or habit such as increased status, recognised style or technological appeal (new apps for smart phones).

iv) Target

- A segmented approach is viewed as more useful—one that appreciates the differences in people's attitudes, barriers, motivations and current behaviours. Income, household size, gender can be more associated with behaviour than a 'green' attitude. Tailored information, language, message, policy measures and incentives can often work well when targeted to specific groups (e.g. lifestyle, demographic) or for particular contexts.
- Approaches which combine information, incentive, peer comparison and engagement are more effective than just the incentive.
- Useful to target moments of lifestyle transition and institutional or infrastructural pressure points (moving house can bring about new habits forming).

v) Adopt a Mixed Approach

- Using a mix of instruments to spur behavioural change so different levers such as incentives, regulation and public benefits pull together in a coherent, co-ordinated and systematic way. A combination of information, visible signals of collective action and government support have had impact on recycling behaviour in the UK (Page, 2010).
- Strategies can use visible or less viable mechanisms to achieve good results—so it doesn't always have to contain a pro-environmental message.
- Demonstrate by doing—government has a leadership role in changing behaviour.

1.4 What are the Co-Benefits of a Carbon–Neutral Society?

Finally, as well as reducing emissions, it is useful to consider the many co-benefits[6] of a carbon-neutral society including public health, increased energy security, cost savings for households, potential job creation and better social cohesion and quality of life (The World Bank, 2010);(Smith, 2013). These could play a significant role in gaining public support for a carbon-neutral vision.

Energy efficiency schemes and programmes in particular can have wider social and community impacts, contributing to increase social capital and social networks, through for example the involvement of young people, creating local jobs and

[6] These are the benefits that can be gained through GHG reduction and sustainable policies, other than GHG reduction.

enterprise. Reduced energy consumption benefits society through health and well being impacts, poverty alleviation, increased disposable income, at a household level. In a report for the OECD/IEA Ryan and Campbell argue that:

> the benefits attributed to energy efficiency are multiple and range from localised benefits, such as energy affordability, social development and improved health and wellbeing, to sectoral benefits, such as industrial productivity, improved asset values and reduced environmental damage. Economy-wide outcomes such as energy security, national competitiveness, greenhouse gas emissions mitigation and poverty alleviation in both developed and developing countries, are also attributed to energy efficiency measures (Ryan & Cambpell, 2012: 8).

The OECD reports that most of the co-benefits are health related; typically accounting for 70-90 per cent of the total value of co-benefits (OECD, 2000). The health co-benefits may accrue to individuals (e.g. due to increased physical activity) or to populations (e.g. reduced exposure to air pollution) or to health systems (e.g. through reduced costs of electricity due to increased efficiency). In some cases the value of the health benefits of these policies can partly or wholly offset the costs of implementing them (Haines & Dora, 2012: 233).

The Institute for Public Health argue that co-benefits to health of greater energy efficiency, particularly through better insulation, can play a significant role in reducing negative health effects associated with fuel poverty, especially for more vulnerable groups including the elderly, lone parents and the unemployed (Institute for Public Health, 2010). They argue that there are also health benefits of active travel, reduced emissions and low-carbon food chain.

The World Bank include other co-benefits from less carbon intensive lifestyles as energy affordability and efficiency, social development, improved health and well-being, increased disposable income at a household level, potential job creation through switching to renewable energy (The World Bank, 2010: 329). Non energy co-benefits include public health benefits from cleaner air and water, the possibly greater comfort of building occupants and higher labour productivity (The World Bank, 2010: 329).

Co-benefits should make deep cuts in greenhouse gases more attractive because they offer the promise of accelerated progress towards both public health and climate goals (Haines & Dora, 2012:2). Others argue that the improvement of health both locally and globally should be one of the main criteria motivating climate-change mitigation measures. The potential health co-benefits and harms should be considered when making choices about mitigation policies. Policies that address both

public health and climate change are more attractive than focusing on either in isolation (Haines & Dora, 2012).

As well as gains through climate action, there are potential risks of inaction. These have been detailed by the EPA for Ireland as including increased flooding, water shortages and risks to water quality, increased storms and rainfall events and risks to biodiversity and fisheries.[7] There may also be benefits to changes in Ireland's climate such as gains for agriculture and tourism if the summers were warmer. These are considered in relation to adaptation elsewhere, for example by Forfás, in relation to risks and opportunities for business (Forfás, 2010).

1.5 Conclusion

This chapter set out some of the central issues surrounding the examination of social and behavioural aspects of climate change. Although difficult to do, there is considerable value in mining current evidence and practice, giving the importance of doing things differently in the coming decades to reduce emissions. Some of the co-benefits outlined include improved health and well-being and greater quality of life. The following chapters identify key strategies for areas of Irish life: energy efficiency, social acceptance of renewable energies, travel behaviour and farming practice.

[7] http://www.epa.ie/whatwedo/climate/communicatingclimatescience/frequentlyaskedquestions/answer,27226,en.html

Practices and Behaviours Within Key Sectors

Chapter 2: Energy Efficiency

2.1 The Social and Behavioural Context

Irish people are aware of the need for greater energy efficiency, however this has not translated sufficiently into insulating, purchasing or energy management behaviour to any great extent. Research for the Consensus project found that although 73 per cent of respondents stated that they would be willing to install insulation in their homes for environmental reasons, less than one quarter of respondents (23 per cent) had actually done so in the past five years (this was higher at 28 per cent in a Eurobarometer survey (European Commission, 2011b)). They found that although levels of environmental concern were high, very few respondents stated solely environmental rationale for their household energy efficiency behaviours (Lavelle *et al.*, 2012b). Nevertheless, there has been an increase in retrofits in recent years and the availability of grants through the Home Energy Saving Scheme.

A review of international evidence for the Scottish Government argues that:

> of all environmental behaviours, domestic energy consumption seems to be the most receptive to change, particularly where that change is convenient, easy and inexpensive, such as turning down a thermostat by one degree or switching to low energy light bulbs (Casey & Holden, 2006: 1).

But people do not consume energy as an end to itself but rather energy use is a consequence of action with some other purpose (Breukers *et al.*, 2009: 49), (Bell & Hindmoor, 2009). The Behavioural Insights Team in England argues that:

> encouraging the uptake of some of the most effective energy efficiency measures demands an understanding of how people behave and use energy in their homes and businesses and why they do not act already (Berkes, 2007: 7).

The challenge has been well outlined by the Sustainable Energy Authority of Ireland in their Bringing Energy Home report (2010: 4).

> At the heart of it all is a paradox: energy efficiency should actually be a very easy sell. On paper, it is one of the best investments in town, better return than any bank account, an easy and cheap way to save money while improving your comfort. It is also good for the country and for the environment. And yet we don't do it. We know from detailed analysis, and from our experiences every day, that there is huge untapped potential for improving efficiency and reducing costs. In broad terms we all use at least 25 per cent more energy than we need. Most of us could halve our home heating costs by improving insulation and heating controls without any loss of comfort or convenience. Why don't we?

The household raises particular social and behavioural issues in the pursuit of greater energy efficiency practices. These can be examined in relation to: the energy system (e.g. boiler); management of heating/cooling (e.g. thermostat controls); keeping heat in (e.g. insulation); and electricity use (e.g. appliances choice and switching off)—further discussed below. This range of behaviour includes key one-off decisions as well as habitual behaviours. The social and behavioural context varies from heat, which has emotional resonance and is linked to feelings of comfort and home, to a more neutral relationship with electricity and appliance purchasing. In other words, there are different social practices in energy use which need to be considered. Similar issues arise for commercial and public sector buildings but are further complicated by organisational and broader economic factors.

Some of the reported barriers to behaviour change in energy efficiency include :

- Individual barriers (e.g. uncertainty and skepticism, lack of knowledge/understanding of benefits and value, reluctance to change lifestyle; habits; beliefs, self efficacy);
- Social barriers (free rider effect of benefiting from the actions of others, social norms); and
- Cultural barriers (lack of infrastructure/enabling supports, traditions, political system) (Lorenzoni *et al.*, 2007).

2.2 Supports to Energy Efficiency

However, there is increasing evidence to show that people-centered, behavioural approaches to changing energy use practices can substantially reduce building energy consumption at little or no cost, and without policy or regulatory mandates (Holden, 2012). There is a broad literature on energy efficiency practices so only some of these are presented here. Public and private buildings will be discussed briefly in the next section.

Household Energy Efficiency Supports

Table 2.1 identifies some of the key social and behavioural aspects identified. These are the particular supports and approaches that have been found to be useful as part of energy-efficient programmes or policy strategies. A key message from this literature is that mixed supports are most effective (e.g. not relying on price incentives alone).

For householders to reduce energy demand they must: (i) know what to do; (ii) have a reason for doing it and (iii) have the resources to do it (Rowntree *et al.*, 2010).

Approaches which combine information, incentive, peer comparison and engagement more effective than just the incentive.

Table 2.1 Supports to Energy Efficiency Strategies

Supports	Methods	Social/behavioural aspects
Pricing	Incentives, flexible	Affordability, signals policy importance, upfront incentives, pricing alongside other supports
Feedback and metrics on energy use	Smart meters Tailored bills Apps, new technologies[8] Information on different suppliers	Personalised/tailored, continuous, visually appealing, desire for control
Setting targets/goals	Create community/city/national goals, public appeals	Intrinsic motivation, commitment[9]
Make change visible	Badges, notices, stickers showing low energy use	Public acknowledgement
Right messenger	Local champions, sports clubs, local communities, new technologies[10]	Trust, social networks
Target moments of threshold	Moving house, new baby, retirement	Moments of change, new habits forming,
Provide salient/nuanced information on benefits, prompts	Give salient examples of energy savings; Tailored information for different groups (elderly, young people, homeowners). Labelling of products.	Relevance, engaged, greater awareness (e.g. increased value of house)
Encourage behaviour change	Personal contact, advice, encouragement, demonstration	Supportive context

[8] The design firm DIY Kyoto (as in Kyoto Protocol) produce a device called the Wattson, which not only shows your energy usage but can also transmit the data to a Web site, letting you compare yourself with other Wattson users worldwide. In a Borg-like way, users can see how much they've collectively reduced their carbon impact. http://www.wired.com/techbiz/people/magazine/15-08/st_thompson

9 In the US, 'block leaders' (neighbours/champions) approached homes and used a variety of community-based social marketing strategies, including seeking a verbal commitment, to encourage the household to begin recycling. The homes that were visited by a block leader were more than twice as likely to recycle than was a group who received flyers (McKenzie-Mohr, 2000).

[10] The Ambient Orb by Southern California Energy Company reduced peak energy consumption by 40 per cent- it glowed red with high consumption. http://www.greentechmedia.com/articles/read/the-ambient-orb-gets-zigbee-connected

	projects in houses/schools, sharing good practice, market strategy through the media, make new behaviour attractive, create reflection opportunities (carbon conversations)	
Comparison with others[11]	Information on energy use of neighbours, local community, smiley face on bills to signal 'good' practice (Opower)	Provides incentives to change, creates social norms, warm glow effect of 'good' practice

Sources: (Jolly, 2011) (ICMSA, 2011) (Berkes, 2007) (Breukers *et al.*, 2009) (Yan *et al.*, 2012) (De Serres *et al.*, 2011) (Casey & Holden, 2006) and (Pollitt & Shaorshadze, 2012)

As previously outlined, the key behaviour areas for home energy are:

- Installing a more efficient energy system;
- Keeping the heat in;
- Better heating management; and
- Saving electricity (Yan *et al.*, 2012).

i) Energy system

Replacing the boiler to a more efficient system is a key part of many household policy strategies often offering incentives to change. Some which have been effective include a boiler scrappage scheme, quality assurance standards for installers, no upfront costs, regular energy feedback on usage. However there is recognition that there is limited incentive to replace boiler when the current system is thought to be working fine (Yan *et al.*, 2012) and the replacement boiler needs to be affordable.

ii) Better heating management

New technologies are helping to create new social norms around heating practices as well as making their use more attractive.[12] In other jurisdictions, energy efficiency campaigns have focused on turning down the thermostat by one degree as a key practice that householders could adopt. However there are, strong cultural notions of comfort which have developed since central heating became the social norm. However, households vary as to what their level of comfort is, with some setting the temperature lower and wearing extra clothing, and others creating a hotter environment as standard. As noted in a recent Scottish review, feedback can provide

[11] Opower, an American utility company uses feedback to improve energy savings and have found that providing comparative feedback on energy use works to reduce use further.

[12] Climate, an Irish clean-tech start-up, has created a new system and smartphone app to control your home heating. Won Best Product of the 2012 SEAI Energy Show.

impetus for reducing energy use, as heating management isn't an established habit for all. 38 per cent of Scottish households do not regularly adjust the temperature and 14 per cent tend not to changed it even if it became too warm (Yan *et al.*, 2012).

iii) Keeping the heat in

Retrofitting houses is the main policy strategy in this area. Preventing financial and energy loss are key drivers and influences on intentions. Table 3.2 presents some barriers and effective strategies to support retrofit measures.

One common concern in this area is the rebound effect in which some or all of the expected energy savings from energy efficiency improvements do not occur because of increasing demand for energy and other services. This is illustrated by the widespread finding that increased home efficiencies can often give rise to higher heat levels after a while, either through increased use or use of energy elsewhere, the 'rebound effect' of between 10 and 30 per cent (IEA, 2011:16).

However, people have taken up grants for this purpose in Ireland. To understand what motivated people to take part in Home Energy Saving Scheme, the SEAI conducted research which found that key factors were the comfort gains (61 per cent), energy savings (85 per cent) and a belief that the value of their home has increased (65 per cent). The first tangible impact was clearly improved comfort. Home heating has a strong emotional dimension, and people do not view upgrade options in pure economic terms (SEAI, 2010: 6).

The report concluded that:

> What is clear is that people don't make, nor subsequently evaluate, decisions based solely on economic considerations. Comfort and the emotional satisfaction of a warm home are bound up together and need to be addressed as an important part of the marketing mix (SEAI, 2010: 17).

Some of the barriers and strategies for increasing retrofitting practices are outlined in Table 2.2.

Table 2.2 Social and Behavioural Barriers and Strategies for Retrofitting Homes

Barrier	Practical Strategies and Associated Social and Behavioural Aspects
Hassle, inconvenience	Loft clearance; quality assurance for installers; salient information, keep it simple
Finance	No upfront costs; stress economic value of property
Not understanding losses and savings	Increased thermal comfort levels, energy savings; focus on losses rather than gains; thermal imaging; use colourful examples with concrete savings
Lack of information	Salient targeted information at points of decision
Uncertainty, lack of trust	State support and guidance; peer support; no delay from sign up to installation; use of champions[13]
Property type and demographic	Target relevant homeowners and likely demographics
Lack of environmental awareness	Information and marketing campaigns; community actions

Sources: (Yan et al., 2012), (Berkes, 2007), (Casey & Holden, 2006), and (Duffy et al., 2011).

One example of the use of behavioural aspects in relation to keeping the heat in is the UK's Green Deal which starts officially in 2013, outlined in Box 2.1.[14]

Box 2.1 The Green Deal (UK) Social and Behavioural Aspects

The main focus is on retrofitting properties with repayments made through electricity bills. Some strategies are based on social and behavioural theories. Measures include reducing the hassle factor through a free loft clearance services; offering rewards at a community level for taking up the deal and collective purchasing (appealing to social norms and social networks); offering individual early incentives such as tax holidays and vouchers (as people tend to discount future costs and respond to immediate rewards). Another strategy is the use of key life moments such as moving house, the birth of a child, retirement to encourage the take up of prompted choices (linked to the default approach).

Source: (Berkes, 2007)

iv) Saving electricity

In recent years, switching off lights and appliances when not in use is becoming a social norm. Other actions, less common are to switch suppliers to more renewable

[13] Dundalk Sustainable Energy Community trained 'champions' and achieved a 20 per cent change in energy efficiency.

[14] http://www.decc.gov.uk/assets/decc/11/tackling-climate-change/green-deal/6634-the-green-deal-a-new-way-to-pay.pdf

energy suppliers. Saving money is the main driver for this behaviour and is less often driven by environmental awareness. However, an OECD survey of 10,000 households in ten countries (not Ireland) found that environmental awareness impacts on the purchase of energy saving appliances and on energy saving behaviour (OECD, 2011). They also reported that incentive based policy instruments such as electric metering did reduce energy demand from households. The mere fact of metering and introducing a price on the use of environment related resources had an effect on people's decision making, even if the price was low. This suggests that recent campaigns to provide information to consumers by installing smart meters that display accurate real-time information on energy use in the home will affect household decisions to some extent even at low prices (see Box 2.3).

Box 2.2 Smart Meter Trials

Results from Smart Metering trials run by the Commission for Energy Regulation in 10,000 Irish homes and businesses found that a smart meter in combination with Time of Use Pricing, In-Home Display Units and related initiatives such as Smart Bills, resulted in an overall reduction of 2.5 per cent in electricity demand for residential customers, with peak-time usage in particular reduced by 8.8 per cent on average (Gargan, 2012).

A large UK study, the Energy Demand Research Project tested consumer responses to different forms of energy use information including gas and electricity smart meters, involving 60,000 households from 2007-2010. Providing advice, historic feedback and a smart meter resulted in a 2.3 per cent saving overall in the first year, and 4 per cent in the second year (Rowntree *et al.*, 2010). The project also involve community engagement initiatives in three villages, through providing incentives and targets. There was no significant reduction in energy consumption when the intervention did not include a smart meter.

v) Renewable Energy

The OECD found that being concerned about the environment is associated with the purchase of renewable energy. However people were not prepared to pay more than 5 per cent above their current bill (OECD, 2011).

The Consensus survey of household consumption found that just over one fifth of respondents (21 per cent, n=315) had changed to a renewable energy supplier in the past five years. Of these respondents 65 per cent stated 'financial reasons' as their rationale for this behaviour (n=266) and only 9 per cent reported 'solely environmental reasons' (n=38). Respondents in the 34-49 age group (26 per cent, n=137) were the most likely age cohort to have changed to a renewable energy supplier (Lavelle *et al.*, 2012b).

The Workplace: Private and Public Sector Buildings

Buildings for building and public sector use are simpler places for energy efficiency to some degree but staff awareness and organisational issues still arise. The SEAI, in

their work with the private sector, focus on gaining senior level commitment for energy efficiency drives. Companies have implemented successful energy efficiency drives through engaging with staff, competitions, quizzes and through linking work with home, so that messages were carried forward (e.g. Citibank in the IFSC).

Metrics and feedback are examples of voluntary, inexpensive, behavioural approaches that can leverage significant energy savings. One study found that simply giving office building occupants a web page to track their energy use led to a 15 per cent reduction in their consumption (mainly on vehicle emissions) (Holden, 2012: 24).

Other measures include changing defaults on lights and appliances reducing on times, motion detectors and other supporting technologies. Bringing in a competitive element is effective such as through performance league tables, competitions between buildings and also through public commitments to reduce emissions. In the UK, real time energy use for government departments are displayed in Whitehall and league tables produced. 10 per cent savings were achieved in the UK through these efforts (Berkes, 2007).

Public sector leadership has an important role to play in changing energy efficiency behaviour. In Ireland, a target for the public sector to improve its energy efficiency by 33 per cent has been set and 'will be seen to lead by example—showing all sectors what is possible through strong, committed action' (Department of Communications, Energy and Natural Resources, *National Energy Efficiency Action Plan 2009–2020*).

A report by the Scottish Government on workplace initiatives identified these critical success factors for influencing behaviour. They concluded that 'a combination of educational activities, changes in organisational policies and investments in infrastructure can foster new organisational values'. They added that 'addressing individual, social and material factors jointly in a coherent and holistic programme is essential to foster lasting change' (Purvis *et al.*, 2011: 6).

Table 2.3 outlines some critical success factors which have been found for workplace initiatives.

Table 2.3 Critical Success Factors for Energy Efficiency Behaviour Change Initiatives in the Workplace.

Creating positive perceptions of costs and benefits	Provide supporting infrastructure and equipment
Minimise initial perceptions of inconvenience	Use formal incentive schemes
Embed shared values	Use organisational frameworks and policies
Gain access to expertise	Balance carrot and stick approaches
Consult with and Involve staff	Seize transformative moments of change
Provide information, advice and guidance	Use multiple influencers
Active and visible participation of senior managers	Set up 'green' teams
Share performance feedback	Make it part of the job and organisational routines

Source: (Cox *et al.*, 2012)

Changing Social Practices at Work

While many of the energy efficiency approaches outlined so far focus on individual behaviour change, a broader focus on social practices and the energy system are emerging as new areas of research and focus.

There is no doubt that the social context is important for 'framing' behaviour change. *Cool Biz*, an example from Japan, is widely cited as an illustration of the value of changing social norms to support energy efficiency drives in the workplace (see Box 2.3). Rather than focusing on individuals, the campaign focused on changing the social norm of what to wear at work and this resulted in less energy use.

Box 2.3 Cool Biz

One reportedly successful initiative which focused on the heating/cooling social practice in offices was Cool Biz in Japan. Cool Biz was a campaign organised by the Japanese Ministry of Environment which aimed to reduce energy use in buildings by setting air conditioners at no lower than 28° in the summer. They introduced a new dress code with 'breathable' fibres and no ties, changing the social norms. The Ministry estimated there was 1.14 million ton reduction of CO_2 emissions (Yan *et al.*, 2012).

However, changing social norms around how we use energy is challenging due to the many different levels of action needed, particularly in long-term transition. One analytic framework used here to look at particular sectors is one adapted from Nye *et al.* (2010). This is a five-part framework for categorising and analysing the active roles of domestic actors in energy-system transition (using a social practice approach). It recognises the inter-connectedness of systems, individual behaviour and technologies and places emphasis on system-wide change as much as on the

individual/consumer and raises questions which we need to consider to address system-wide change:

i) Facilitating deliberate energy **conservation** through changes in the visibility of energy—e.g. Are consumers more aware of their energy-use habits and routines?

ii) Change in habits/routines or shift to **more sustainable lifestyles**—e.g. Have unsustainable routines been disrupted and replaced with more sustainable patterns of actions?

iii) Changes in normative/conventional understandings of proper energy use—e.g. How might niche innovators **change conventional understandings** about the proper use of energy (change social practices)?

iv) Increased demand for and new uses for **low-carbon/more efficient technologies**—e.g. How might habits/routines domesticate these new technologies?

v) Influencing the **shape of the sociotechnical regime—e**.g. How do the above actions influence the politics and technological character of the regime? (Nye *et al.*, 2010)

Other work by the Consensus Project, previously outlined in Chapter 2, focused in part on home heating. See Box 2.4.

Box 2.4 Changing Heating Practices to 2050

The practice of home heating was taken as the primary unit of analysis as it represents the highest end-use of energy in Irish households accounting for 70 per cent of total home energy consumption (Doyle & Davies, 2012).

Three themes emerged in the home heating backcasting exercise: thermal awareness, carbon management and adaptable homes. Ideas for each theme were identified for short (2012-2020), medium (2020-2035) and long-term (2035-2050). Here is one example for each timeframe.

Short Term—R&D Advanced thermal performance clothing & 'body heat vests'—R&D to develop advanced thermal performance day wear. Focus research on the development of 'cosy coats' for warmth indoors, and 'body heat vests' powered by renewable or kinetic energy for direct on-body heating.

Medium Term—Thermal ratings required for clothes—Day wear (rather than high fashion clothing) is required to have thermal ratings indicating their insulating / warmth capacity.

Long Term—Personal carbon allowance research on appropriate quotas to set in accordance with international and national carbon reduction targets. Examine social, environmental and economic implications and develop a plan for implementation.

Source: (Doyle & Davies, 2012)

2.3 Conclusion

This chapter has presented some useful approaches to energy efficiency drawing on key social and behavioural research. One key insight is that energy use needs to be made more visible so that consumers can gain feedback on what they are using. It is clear that while individual energy efficiency is important, long-term change has to come from systems change.

In the short to medium-term, more research could be helpful. While there are evidenced-based strategies from UK and internationally, there are only pockets of research available in Ireland on the application of social and behavioural theories to energy usage. There is a need for more:

- Data on consumption practices, about how people use energy in the home;
- Evaluation of energy-saving measures and policies and the outcomes achieved across the household; and
- Evidence for strategies that are effective in sustaining behaviour change and social practices over time.

Chapter 3: Social Acceptance of Renewable Energy Infrastructure

3.1 Social Acceptance

A key consideration of increased renewable energies in Ireland and their infrastructure, such as wind turbines and electricity pylons, is their acceptance by local communities. If renewable energy is a core part of tackling carbon emissions and climate change, issues of public support and opposition have to be addressed and diverse publics have to be meaningfully engaged (Haggett, 2011: 24).

In a study for the SEAI on enhancing community acceptance of wind energy in Ireland, Ellis examines social acceptance in terms of three interdependent components: market acceptance (i.e. adoption and support of the technology by investors and consumers); socio-political acceptance (i.e. broad public opinion in favour of wind energy technologies); and community acceptance (i.e. acceptance of specific siting decisions by local residents) (Ellis, 2012: 12, Wustenhagen *et al.*, 2007).

While there is broad socio-political acceptance in Ireland, community acceptance is variable. In a survey of attitudes towards wind farms in Ireland in 2003, SEI (now SEAI) reported that most Irish people have positive attitudes towards wind energy in general (80 per cent) and two thirds are favourably disposed to having a wind farm built locally (Sustainable Energy Ireland, 2003). With 176[15] operational wind farms in Ireland, there is considerable acceptance overall. However, there has been local reaction to proposed developments. For example:

- Local opposition has been reported in relation to power lines, pylons and wind turbines. For example, Eirgrid proposes to build a new €20 million, 40km-long 100KV double power line between the Clashavoon substation 10km north-east of Macroom and the Dunmanway substation. Submissions were made by a large number of objectors to the proposals ranging from the Community Before Pylons lobby group to private individuals.[16]
- Communities for Responsible Engagement with Wind Energy (Crewe) was established in June 2012 as a group of community groups concerned about wind energy developments.

[15] Irish Independent, 28 August, 2012.
[16] http://westcorktimes.com/home/?p=12089

In broad terms, community acceptance of wind energy developments is variable and dynamic (Ellis, 2011, 2012). Often the response is initially positive and can then dip in response to a planning application and rises again once the development is complete and may even increase (Barry & Ellis, 2010:31).

Community acceptance is not just heavily influenced by the real and perceived impacts of a project, but any response will be mediated by how host communities view the decision-making process, their experience of how past decisions were made and the level of trust they have in the developer, local politicians and regulatory agencies (Huber *et al.*, 2012: 228).

In relation to electricity (grid) infrastructure, the public acceptance of wires and pylons is also important. While raising awareness about the public benefits of investing in the grid could be of value, including the role of job creation and security of supply, understanding acceptance or resistance to local developments will require a focus on a wider set of local practices, behaviours, values and attitudes.

The Department of Communications, Energy and Natural Resources have recently outlined the importance of energy infrastructure and the role that community acceptance plays. 'Many people are concerned about the impact that new transmission lines and other energy infrastructure can have on the landscape, the environment and on local communities' (Department of Communications, 2012: 4). They also outline the need for social acceptance and the appropriateness of exploring ways of building community gain considerations into project planning and budgeting. Delivering long lasting benefits to communities is an important way of achieving public acceptability for infrastructure.

They emphasise the importance of

> early and ongoing engagement and consultation with local communities and all stakeholders before entering planning. This is essential for building public confidence ensuring a more balanced public debate and a more timely delivery of projects (:4).

3.2 Types of Local Engagement

Positive societal engagement can be viewed as varying from broad attitudes and awareness of different energy types but no direct involvement on one end of the spectrum, to leadership and ownership of community projects and microgeneration, at the other end. The level of community engagement can make a difference in increasing acceptance of developments such as wind farms. The Renewable Energy Partnership argued in 2004 that low levels of community involvement in wind has contributed to increased opposition to wind energy projects (Ellis, 2012: 20).

There may be some emerging issues arising from Ireland ratifying the Aarhus Convention in June 2012, an international environmental agreement in June 2012.[17] It grants the public rights regarding access to information on the environment; participate in decision-making affecting their health or the environment; and have access to justice when these rights are denied or when acts and omissions by private individuals and public authorities contravene provisions of national law relating to the environment (Ewing, 2011). This has the potential to change how environmental information is disseminated and accessed by the public and may have implications for how people are consulted over renewable energy developments.[18]

Professor Devine-Wright in the UK argues that while there is public resistance to developers, the level is often exaggerated and there is nothing inevitable about NIMBY (Not In My Back Yard) objections.[19] He counters the narrow media view that often presents the public as ignorant of technical issues, resistant to new technologies and concerned only with their own private property. Such conceptions of the public have led to a growing focus upon providing 'community benefits packages' for each wind energy project in the UK, and which aim to allay the presumed self interested concerns of local residents (Devine-Wright, 2011: 22). However, with considered and meaningful community engagement, such as response can be minimised (Devine-Wright, 2011). What is needed is a progressive approach to fostering greater levels of community support (Ellis, 2012: 7).

While building community support may be effective in the longer term, there remain some local concerns over wind farms, such as health and environmental concerns, including noise impacts, among others. The Environment and Public Health (Wind Turbines) Bill 2012 is under consideration by the Oireachtas. It seeks to set a minimum distances from houses to turbines.

Ellis *et al.,* (2009) argue in relation to the social acceptance of wind that local opposition not as influential on outcome as often presumed and that opposition is often fuelled by insensitive handling of proposals. International experience suggests that a greater level of local ownership of wind energy projects is an important option for maximising local benefits (Ellis, 2012: 14). By owning or sharing a stake in

---

[17] The Aarhus Convention lays down a set of basic rules to promote citizen's involvement in environmental matters and improve enforcement of environmental law; its provisionsare broken down into three pillars: access to information; public participation in environmental decision-making and access to Justice http://www.environ.ie/en/Environment/News/MainBody,30552,en.htm

[18] http://www.irishtimes.com/newspaper/ireland/2012/1016/1224325298346.html

[19] In the UK, four main paths to wind development projects have emerged: i) state led; ii) company led; iii) community led (too small in scope and size so restricted); and v) hybrid of community and company (interesting on-shore wind project in Scotland).[19] Most are private developer led.

renewable energy projects, or debating how community benefit streams might best be invested, society can contribute to and be involved in setting sustainability goals mores generally (Strachan & Jones, 2012: 190). It has been suggested that the development of renewable energies in Ireland concerns more than infrastructure but is a social project (Ellis, 2011).

Local authorities have a key role to play in providing the supports for the development of renewable energy strategies (LARES). SEAI produced a draft methodology for public consultation for this purpose which outlines the key steps required. Planned reform for local government will increase the expectation for local authorities to deliver in energy efficiency and the use of renewable energy. Local authorities will have greater delegation for energy efficiency and environmental functions as outlined in *Putting People First, the Action Programme for Effective Local Government* (Department of Environment, 2012:vi).

3.3 Levels of Community Engagement: Acceptance to Ownership

In their policy paper of 2011, *Community Renewable Energy in Ireland*, Comhar reviewed the status of community renewable energy, its policy framework, barriers and potential options. They outlined the current state and context for community renewable energy projects in Ireland. Community renewable energy can be defined firstly by who develops a project and the level of engagement with the wider community, and secondly by how the benefits of a project are spatially and socially distributed. Community projects are those in which these dimensions are to some degree local, collective and participatory (Comhar, 2011: 1). Community wind projects are locally owned by farmers, investors, businesses, schools, utilities, or other public or private entities who utilise wind energy to support and reduce energy costs to the local community. The key feature is that local community members have a significant, direct financial stake in the project beyond land lease payments and tax revenue.[20]

Comhar's Community Energy Map identified the status of community energy schemes across Ireland. It includes a small, but growing number of community wind schemes, funded and managed in a variety of ways. The 2004 *To Catch the Wind* study by the Renewable Energy Partnership only included two small-scale developments that could be regarded as community projects and Comhar noted only one other completed project, a further nine in development and a further two that have been unable to proceed (Comhar, 2011).

[20] http://en.wikipedia.org/wiki/Community_wind_energy

With the numbers of wind farms rising in Ireland, farmers have a potentially strong role in the development of projects, in terms of leasing land and promoting wider acceptance and the potential for co-ownership.[21] There are taxation and business implications of using land for this purpose as a recent article in the Irish Independent outlined (Ryan-Purcell & Walsh, 2012). The Irish Farmers Association (IFA) established a Wind Energy Project Team and took part in negotiations regarding the proposed 5,000MW Energy-Bridge wind power project (Mainstream Renewable Power) in the Midlands, reportedly agreeing a package of measures for the 600 farmers who will be affected (Irish Independent).[22] This represents an interesting example of mediation between communities and energy developers.

Community acceptance is being promoted directly and indirectly by some communities themselves, local authorities and developers of wind energy facilities in Ireland are already promoting (directly or indirectly) community acceptance in a variety of ways (SEAI, 2010) (Ellis, 2012).

The Monaghan Model on community consultation developed in 2005 has become an approach regularly used by public bodies and private developers. It proposes a template for approaching consultations, and aims to ensure that the community sector can meaningfully engage with service providers in enhancing local decision-making. The Monaghan Model is made up of six Stages:

Stage 1: Defining the consultation;

Stage 2: Designing the consultation elements;

Stage 3: Promoting the consultation;

Stage 4: Implementing the consultation and recording the inputs;

Stage 5: Feeding back to the participants;

Stage 6: Evaluating our work, and learning for next time (Ellis, 2012: 22).

Some international examples can be found in Denmark and Scotland.

Denmark

Denmark has a strong tradition of small locally owned wind energy sources (Ellis, 2012) and is now a world leader in community ownership of wind farms. Up to 20 per cent of Denmark's energy needs are currently met by wind, of which 80 per cent is generated by 2,100 community-owned farms.[23] In Denmark, when a wind farm is

[21] http://www.teagasc.ie/ruraldev/docs/factsheets/49_WINDFARM.pdf

[22] http://www.farmersjournal.ie/site/farming-IFA-initiate-new-Wind-%5CnEnergy-Project-Team-15575.html

[23] http://www.seai.ie/Archive1/Files_Misc/File3.pdf

built, 20 per cent ownership must be offered to the local community. They don't have to buy, but it is offered to them. Denmark's 2008 Renewable Energy Act provides an option to purchase 20 per cent for the host community as well as financial support for local cooperatives (Nielsen, 2010).

Scotland

Scotland has supported community energy ownership through tailored schemes since 2003, resulting in over 800 projects. The Scottish Government (2011) includes a focus on the benefits from renewable energies going to individuals and communities, and not just private investors. It recently set a new target of 500 MW community and locally-owned renewable energy by 2020 and has set out how it will achieve this in its Routemap for Renewable Energy.

Fintry, in the Scottish Highlands, a community-owned wind project secured ownership of a 2.5MW turbine at the 35MW Earlsburn wind farm in 2004. This came online in 2008 and, at the time, it was the biggest community-owned renewable-energy asset in the UK. With only 500 people in the village, they negotiated for 1/15 of the annual profit over 15-20 years.[24]

Irish Community Projects

Drumlin Wind Energy Co-operative hopes to be the North's first community co-op and is raising investment through shares, but returning some of the profits to the local community. It is being led by Energy4All—a not-for-profit organisation in the UK owned by the community co-operatives it creates.[25] Other examples are presented in Boxes 3.1 and 3.2.

Box 3.1: Case Study: Camphill Ballytobin

Camphill Communities of Ireland is part of an international charitable trust working with people with intellectual disabilities and other kinds of special needs. Camphill Ballytobin houses 85 people on an eight hectare site and includes a primary school, workshops and a community hall. Since 1999, Camphill Ballytobin has used biogas to supply heat to houses and other buildings on the site. The project has received support from the EU Horizon and Altener programmes, the Department of Agriculture and Food and LEADER. The project provides full-time employment for five people and saves up to €25,000 per year in heating. The project displaces at least 380 tonnes of carbon dioxide per year. Camphill Ballytobin collects agricultural waste from local farmers and delivers treated nutrient rich soil amendment back to farmers. Profits are ploughed back into the community to fund buildings and equipment. The most significant barrier faced has been difficulty in obtaining a Power Purchase Agreement that would allow the connection of the community's Combined Heat and Power Plant to the national grid.

Source: (Comhar, 2011)

[24] http://www.windpowermonthly.com/go/enews/article/1143179/

[25] http://www.irishtimes.com/newspaper/finance/2012/0821/1224322585945.html

Box 3.2: Case study: Templederry Energy Resources Limited

Templederry Energy Resources Limited in Tipperary has identified renewable energy as a means to achieve social, economic and environmental development for the community. A wind farm with two 2.3MW turbines is due to be built and connected in 2010-2013. It is registered as a private limited company, with shares held by the Local Development Co-op (2 shares) and individuals (30 shares) residing in the village and surrounding area. The project got planning permission in 2003 and then applied for a grid connection, which they received four years later. There was a further two year delay as they waited for a turbine, which meant it was necessary to re-apply for planning permission. This time the planning was appealed to An Bord Pleanala, which resulted in a delay of over two years. The group got planning in 2009. The project has received support from Tipperary LEADER Group and continual financial, technical and practical support from Tipperary Energy Agency. Each shareholder invested a thousand euros initially and has contributed additional funds since. The group has also sourced Business Expansion Scheme funds and is in the initial stages of arranging bank finance. Following a tendering process with four energy providers, they have signed a 15 year power purchase agreement with Bord Gáis. It is expected that investors will get a return on investment 8-10 years after the wind farm is commissioned.

Source: (Comhar, 2011)

Community Gain

As well as perceived risks and loss, there can be considerable community gain arising from renewable energy projects. This is refers to the more indirect effects of a project, for example jobs created in construction or maintenance, improved local facilities (e.g. roads), additional income to the local authority or income to a landowner. In some cases, this can result in large community gains where it is part or wholly owned. In addition, there may be some benefits offered to the local community. This may take a variety of forms including direct financial payments, grants or investment in community facilities (Ellis, 2012: 9). These are common in the UK, around £1,700 per annum to a community per project. The Highlands Council in Scotland have set their sights on £4,000-5,000 per annum (Strachan & Jones, 2012: 182). These are mostly developer shaped and can contain an annual agreed payment, bonus paid on output and a further once-off payment during construction (SSE example). There are moves to standardise these by the industry (: 184)

While in the UK, there is usually a Trust held on behalf of the community and people bid into it annually for sustainability projects. Conflict can arise in its administration and use as well as who is entitled to bid. There is a need for a consistent set of guidelines, so it makes sense for governments to be involved.[26]

Support is needed such as that given by Community Energy Scotland, an independent Scottish charity that provides free advice and support for community renewable energy projects. The Highlands and Islands Enterprise in Scotland set up a

[26] In conversation with Professor Devine-Wright.

Community Energy Company that provides revolving fund security for community enterprises. In its first project, it took a shareholding in a small wind farm on Gigha which will be bought out by a Trust after five years of operation. It is a valuable model for remote communities with high diversification and regeneration needs (Walker & Devine-Wright, 2008).

In Ireland, wind energy projects provide a range of local and on-going benefits to a local area; for example while each Local Authority will apply a different rateable value to wind energy projects, it is estimated that typically the local authority will receive €5,000 per year for each megawatt installed. Such projects will also generate other benefits through local authority development contributions, other investment in local infrastructure, use of local services and in some cases employment from construction and maintenance' (Ellis, 2012: 20).

Supports to Further Engagement

While engagement can be restricted to gaining local support or maximised to increase community projects, there are common supports which could be considered for renewable energy development. The best ways to engage with communities is not always easy or well understood.

> We are beginning to understand how the inevitable transformation of our energy economy will impact on virtually every aspect of our carbon based society, yet we have not worked out how to include people whose lives will be affected in the decisions which will lead to those changes (Ellis, 2012: 41).

Ellis argues that 'maintaining or increasing community acceptability of wind energy projects will support the successful and efficient deployment and expansion of wind energy in Ireland' and further that 'developing a consensus amongst key stakeholders of the value of fostering community acceptance, the issues that can influence this and how this can be monitored will continue to be an important element in delivering wind energy in Ireland' (Ellis, 2012: 10). Finally, he points out that:

> community acceptance often gives rise to difficult issues that can only be resolved with the commitment of a wide range of stakeholders, including developers, statutory agencies, local communities and other interest groups and progress can only be made if they all engage with this topic with integrity, fairness and transparency (:11).

The no brackets here in final version (Irish Wind Energy Association, 2012) outline some best practice aspects of community engagement:

- Well planned community engagement is likely to increase the likelihood of success for the development;
- Engagement with the local community is recommended at each relevant stage of the project, e.g. early project stages, planning, construction, and operation; and
- Approaches to be taken to community engagement will vary, depending on the stage of development of the project.

Other overarching issues include:

The planning process; policy supports and drivers; support structures for communities; community benefits and community gain; supports for community ownership; capacity building; distributional justice and education (Ellis, 2012: 10). These are outlined further below.

i) Deliberative Planning process

The most effective public engagement processes aim to achieve deliberation rather than just information giving and this can improve the quality and acceptance of good wind energy projects. Planning should be a vital forum for debating society's future rather than a battleground between developers and residents.[27] Such engagement requires new ways of thinking about and practicing public engagement with energy system change, opening up a two-way public dialogue that better connects national policy making with the local places and residents most directly affected by large-scale schemes.

While there is no national zoning system here, County Development Plans (CDPs) are required to identify areas where wind energy developments would be desirable, open to consideration and not normally permissible. There is substantial variation in how these are determined (Comhar, 2011: 18). The nature and suitability of land, including wind speed, are important. The Sustainable Energy Ireland wind atlas shows the wind speed for land for particular sites. SEAI has commissioned a standard methodology for the development of Local Authority Renewable Energy Strategies (LARES) (SEAI, 2012).

ii) Policy supports and drivers

Community renewable energy is mentioned in a number of Government documents, but specific measures to increase community involvement and reduce barriers in the

[27] www.energyireland.ie/building-acceptance-for-renewables

establishment of community renewable energy resources have not been outlined (Comhar, 2011: 30).

iii) Support structures for communities needed

Active engagement with developers and community projects present a complex process for communities. There is a burden on individual drivers within communities and support is needed at a local and national level. It is important that long-term support is provided by the support structure and not just in the duration of initial developer interest.

What can be done for communities when developers come around? The Highlands Council supports local communities to respond through on-line resources. The Western Development Commission (2007), based on their experience of facilitating a community wind farm, concluded that a support structure is required if community involvement and investment is to occur on a widespread basis in Ireland. Mediator groups now exist which act to help community based co-ops to develop, such as Irish Energy Cooperatives.

The IWEA have produced best practice guidelines for the Irish Wind Industry in 2012 as a reference document and as a guide to the main issues wind energy developers should be aware of in developing projects. It outlines how:

> engagement with the community is an important part of the development of a wind farm. There are a number of publications which provide guidelines and methodologies for undertaking community engagement such as the DoEHLG Wind Energy Development Guidelines and the Monaghan Model. The legislative requirement for community engagement is based on the requirements set out in various EU directives, particularly the Environmental Impact Assessment Directive (85/337/EEC) (Irish Wind Energy Association, 2012: 80).

iv) Community benefits and community gain

There is much potential for enhanced practice across the sector, both in terms of increasing community gain through increased local ownership and improving the way in which community benefits are handled (Ellis, 2012).

v) Supports for Community Ownership

According to Comhar (2011), groups need initial financial support and different ways to secure equity finance. This can be very difficult and community groups are perceived as inherently high risk. Grid connection and planning permission can also create delays. Comhar recommends allowing community projects to connect to the

grid more easily and to consider connection to the national grid for communities at no cost to the project (: 3).

vi) Capacity building

Huber *et al* cites Ireland as an example whereby capacity building s is happening led by SEAI with public representatives, planning officials and key stakeholders regularly invited to national and regional workshops on wind policy development (Huber *et al.*, 2012: 222).

vii) Distributional justice

Some communities are called to make a larger contribution than others. This brings opportunities for these areas as well as challenges (Ellis, 2012: 13). Some host communities feel disadvantaged by their lack of experience in negotiating with the developers of wind energy projects. In order to overcome this, a number of countries have facilitated the use of independent advisory or intermediary bodies, potentially funded by the wind energy sector in the recognition that this could speed up community negotiations (Ellis, 2012: 14).

Such a process cannot be solely local, as large-scale projects have outcomes that transcend localities; thus requiring a more effective integration between national and local levels than currently exists in order to ensure coherence between multiple 'bottom up' activities.

viii) Education

For longer term community engagement, there is value in the ongoing energy awareness raising is undertaken by SEAI, An Taisce and Eco-Unesco among others. Specifically on wind energy, the IWEA 'KidWind' initiative aims to train primary and secondary teachers on aspects of the topic with a view to onward delivery to students (Ellis, 2012: 24).

3.4 Conclusion

The development of renewable energies in Ireland is likely to be a key part of Ireland's transition to a carbon-neutral society. This will necessitate the development of wind farms and electrical infrastructure on a larger scale than previously known. It is therefore important that local communities are both aware and prepared to engage and even benefit from these developments. The research and practice outlined in this chapter suggests ways for this to be encouraged. It shows also that such projects can gain from local knowledge and expertise as well. As Haggett argues, there is a need to acknowledge and value local expertise and tacit

knowledge and recognise the importance of contributions that different groups can bring in the development of renewable energies (Haggett, 2012: 24).

A key point is that to further develop renewable energies in Ireland, the right social landscape is as important as its technological counterpart. Community acceptance and that the development of enhanced community acceptance is a shared responsibility for all stakeholders in wind energy and other renewable energy area (Ellis, 2012). Indeed, rather than being viewed as a barrier to development, communities themselves could be supported to play an increasing role in the development and ownership of such projects.

Chapter 4: Travel Behaviour

4.1 Introduction

Changing travel behaviour is a complex task, but there are useful insights from research and practice. Why someone adopts a particular set of travel habits is deeply rooted in social and institutional contexts, so it is valuable to look both at barriers and enablers at an individual level, but also at social practices (such as driving) at a societal/group level. A brief discussion of some of this research evidence is presented with a view to:

- More effective tailoring of policy measures to suit particular groups/consumers;
- More effective implementation of policy measures so that they help remove barriers to and contribute to enablers for adopting more sustainable forms of travel behaviour such as:
- Modal shift—persuading people to change from car usage towards cycling, walking and using buses and trains;
- Achieving societal buy-in for VRT rebalancing;
- Encouraging a greater use of EVs;
- Adopting eco-driving practices; and
- Encouraging greater take-up of mobility management practices.

However, first it is worth briefly noting the individual and social implications of sustainable transport policies and practices in the longer term. *Smarter Travel—a Sustainable Transport Future*[28] (Department of Transport, 2009) and the *Draft Framework for Sustainable Development* (Department of the Environment, 2012) include a focus on changing current travel behaviour, moving people out of cars and into more active and sustainable modes of transport. The reasons for this are multiple—to reduce congestion, to foster more healthy lifestyles and to reduce emissions. Such a shift, to be successful, will not only have infrastructural, planning

[28] In 2009, *Smarter Travel: A Sustainable Transport Future* was published, following the public consultation process, and proposed 49 specific actions under 4 overarching measures, including: (i) actions to reduce the distance travelled by private car; (ii) actions aimed at ensuring that alternatives to the car are more widely available, mainly through improved public transport and investment in cycling and walking; (iii) actions aimed at improving the fuel efficiency of transport; and (iv) actions aimed at strengthening the institutional arrangements required to deliver the targets (Browne *et al.*, 2011: 35, Department of Transport, 2009).

and housing implications, but also require the adoption of a different set of working and lifestyle practices, including more homeworking, more flexible working hours, increased physical exercise as well building a more favourable response to public transport, and a decreased attraction in the private domain of the car. As the Institute for Public Health (2010) note, the co-benefits to health of more active travel are many, including: increased physical activity, which is one of the best ways to improve health overall, in particular reducing obesity; reductions in road traffic injuries; better air quality; lower levels of noise pollution and improved social interaction. In short, the shift towards a more sustainable transport system requires change in both our environment and behaviour.

In general terms, transport persuasion has been focused on three I's—incentivise, infrastructure and information. The focus of this has been on micro and macro levels, but more work is needed to look at the meso level (Rau and Edmondson, 2013). One interesting example of how a focus on sustainable travel at an organisational or 'meso' level may be beneficial is the Green Schools and Green Campuses programme.[29] While broader than travel, it does include a focus on encouraging pupils to walk and cycle and car pool.

A survey, for the Department for Transport in the UK, on attitudes to climate change and transport concluded that any travel behaviour change strategy will be more effective if it targets change at the community level (Anable *et al.*, 2006). There is no doubt that individual behaviour is strongly influenced by other people's behaviour and values. Building trust and shared values within social groups can contribute to the success of behaviour change initiatives. Working with communities to build transport solutions and strategies from the bottom up may be effective in urban areas to implement Smarter Travel policies locally (Avineri & Goodwin, 2010).

A comprehensive socio-technical framework that considers both individual psychological factors as well as the systems, standards and norms under which individuals operate is fundamental to the development of successful strategies to shift towards low-carbon communities (Moloney *et al.*, 2010).

[29] An Taisce runs the Green Schools and Green Campuses programmes.The transport component of the Green Schools programme is funded by the Department of Transport Tourism and Sport and encourages pupils and parents to walk, cycle, Park'n'nStride, use public transport or car pool instead of using the private car on the school run.

4.2 Barriers to Changing Travel Behaviour and Practices

One of the main sets of barriers to sustainable transport in Ireland has been identified as barriers to behavioural and cultural change which include:

- Lack of viable alternatives, particularly for those with a propensity for modal shift or travel demand reduction;
- Lack of knowledge and awareness of the social, economic or environmental effects of travel and transport among the general public;
- Prestige, cultural symbolism and status associated with vehicle ownership, particularly in relation to certain makes and models. This is intrinsically related to social expectations and norms, particularly among certain income groups and demographics; and
- Inelasticity of air travel, particularly given the geographical island status of Ireland and the emotional attributes that air travel confers (Browne *et al.*, 2011: 153).

Consensus survey research shows high levels of car usage as the most common mode of transport. They report that:

> More sustainable modes such as cycling and walking offer realistic alternatives in urban areas where almost one fifth of respondents commute less than two miles to work, school and college. Alternatives such as public transport and carpooling could be promoted to those who face longer commuting distances (Lavelle *et al.*, 2012c).

Rural Ireland is particularly affected by gaps in public transport provision. Almost half of all rural respondents (44 per cent, n=208) reported that there is no public transport for their commute to work, school or college compared to urban areas (28 per cent, n=151). Some 42 per cent of respondents thought public transport was too restrictive (n=272); 17 per cent agreed that 'I need my car or van for my job' (n=108) and 11 per cent that public transport is 'too unreliable' (n=70). When respondents were asked what would encourage people to reduce their car journeys, 53 per cent of the sample stated 'improved, more affordable public transport' (n=792) and 12.4 per cent of the people reported 'financial incentives to encourage walking and cycling' (n=185) (Lavelle *et al.*, 2012c).

4.3 Effective Strategies

The OECD have examined different policy measures[30] in terms of their effectiveness in changing personal transport choices. They argue that a number of factors are important such as: socio-demographic characteristics, area of residence, and personal values with respect to the environment and different household characteristics impact on transport choices including age, gender, household size, location and income (OECD, 2008: 184-6). In addition, the emotional and symbolic aspects of car use shouldn't be underestimated (this will be examined below).

Targeting is a strategy recommended by the OECD (2011). Demographic and socio-economic characteristics (age, education and others) can be used to define distinct segments of the population for which policies are likely to be most effective. For instance, information campaigns to modify personal transport choices will be most effective if they target those groups which have higher car use: men, the middle-aged, and those with higher incomes and education. The OECD conclude that: above and beyond the effects of factors such as price and infrastructure, it is clear that the attitude of respondents toward environmental issues has an effect on personal transport decisions. These results indicate that a soft policy effectively influencing people's beliefs and attitudes to the environment would have a positive impact on substituting their car for an alternative mode.

Some other strategies which are being used by the business sector with some success elsewhere are competitions. The '2-Mile Challenge,' is funded by a food company and challenges people to avoid short car trips through joining teams of walkers and cyclists and their total mileage raises grant funds for charities.[31]

Another scheme for school children in London is the called 'Step2Get' which encourages them to take more exercise and cut congestion and rewards them for walking to school with cinema tickets or shopping vouchers.[32] This uses new card technology getting the children to swipe their card (like the Leap card) along the way. In two pilot schemes at London schools the system managed to get 18 percent of children to switch to walking.

Box 4.1 outlines one initiative being undertaken to promote sustainable travel.

---

[30] Governments tend to use four broad types of environmental policies to influence personal transport demand: pricing measures (*e.g.* fuel taxes, congestion charges, clean car tax incentives); regulatory measures (*e.g.* emission standards, parking restrictions); information (*e.g.* information campaigns, car labelling); and investments in transport services (*e.g.* bus, cycling lanes) or alternative fuel car technologies (*e.g.* hybrid vehicles) (OECD, 2008: 184)

[31] http://2milechallenge.com/pages/about/

[32] http://www.intelligenthealth.co.uk/step2get/

Box 4.1 Smart Moves Challenge

As part of the Consensus project, the Smart Moves Challenge is an ongoing case study involving employees of a large firm in the West of Ireland to leave their car at home at least once a week.[33] The aim of Smart Moves is to promote sustainable travel behaviour and to reduce car use through the development of work place Mobility Management Plans that are tailored to individual companies and work sites. Smart Moves will offer a package of measures that encourage people to walk, cycle, use public transport, car share or avail of other Information and Communication Technology options for making mobility patterns more sustainable.

Another competition is a citywide campaign in Malmö, Sweden, called 'No Ridiculous Car Trips' which awards free bikes to people who have the most absurd stories about times they had used a car to travel a short distance. They base this approach on the behaviour follow attitude approach outlined earlier which in this case allows people to cycle first, experience it and their attitude is more likely to change afterwards. In 1995, the modal share for bicycles was 20 per cent, but it has risen to 30 per cent.[34]

One strategy which draws from psychological insights on persuasion, it to seek a commitment from people to achieve particular goals—good intentions to act. McKenzie Mohr identifies strategies as useful such as asking:

- Commuters to sign a public commitment that they will take public transport once or twice a week for a specific period of time;
- Vehicle owners to commit to turn their car off while waiting to pick someone up. Provide a prompt that they can affix to their windshield or dashboard to remind them to turn their engine off;
- Car owners to commit publicly to checking their car tyre pressure once a month. Provide prompts at petrol stations reminding people to check their tire pressure. Have garage attendants also commit to reminding people to check their tire pressure (McKenzie-Mohr, 2000).

4.4 What are the Levers of Change?

The social and behavioural aspects of transport policy implementation are also significant, and will be particularly so in the journey to a carbon-neutral economy. Many of the broader strategies and approaches outlined earlier will have application here, such as understanding behaviour as social practices shaped within a wider social context; and factors which enable to adoption of 'new' behaviours (for example, behaviours that are 'doable', that are prevalent, are more 'me' and offer advantages (Department for Transport, 2011).

[33] www.smartermovement.org

[34] http://www.copenhagenize.com/2010/09/no-ridiculous-car-journeys-malmo-sweden.html

Understanding the different ways travel is undertaken by particular groups and for what purpose is one key element. Travel choices are usually dependent on four main types of factors:

- *Collective objective factors* ('hard facts' including journey distances, infrastructure, weather, vehicle prices etc);
- *Individual objective factors* ('hard facts' such as income, skills, resource constraints, habit, awareness);
- *Collective subjective factors* (perceptions such as a 'car' culture; social norms; trust in services etc);
- *Individual subjective factors* (perceptions such as, personal identity, perceptions of safety and of costs) (Department for Transport, 2011).

The Department for Transport in the UK argue as part of their 'toolkit' for behaviour change (based on research evidence) that to make appropriate policy decisions, both objective (demographics, characteristics, behaviours) and subjective (attitudes) evidence is required. This would then be followed by identifying the behaviour or social practice that needs to be changed (such as driving to work during peak hours) and identifying the things/material components (such as having a car and a convenient place to park as well as set working hours); skills/know-how (such as knowledge of the best routes between home and work) and images and meanings (beliefs about the 'normality' of peak travelling, perceptions of the car as convenient) associated with it. It is those three aspects of social practices that would need to be focused on to bring about behaviour change.

Digging deeper into such practices, Nye *et al.* (2010) proposed the following questions for energy systems (referred to in Chapter 3) which have been adapted here to explore travel behaviour.

- *Facilitating reduced travel by car through* ***changes in the perceptions*** *of travel.* For example, are consumers more aware of their travel habits and routines? Feedback can help such as the 'Most of Us Wear Seatbelts' campaign in Montana, US with the message that 85 per cent of car users used seatbelts reinforcing it as the norm and self-reported use increased (Department for Transport, 2011).
- *Change in habits/routines or shift to* ***more sustainable lifestyles***. For example, have unsustainable routines been disrupted and replaced with more sustainable patterns of actions? For example, trying the journey to work by bus for a day a week to experience the difference and break the habit.

- *Changes in normative/conventional understandings of sustainable travel.* For example, how might niche innovators **change conventional understandings** about sustainable forms of travel (change social practices)? Through the design of new attractive modes of travel, e.g. Vespa scooter in Italy or a new light transit rail like the Luas can make such travel stylish. Viewing cars as unwelcome in city centres for example through congestion charges might impact on their use.
- *Increased demand for and new uses for **low-carbon/more efficient technologies***. For example, how might habits/routines domesticate these new technologies? The development of EVs will have an impact on conventional understandings of cars, their noise and emissions levels reducing considerably. What will drive car manufacturers to improve the carbon efficiency of their vehicles along with style and marketing, for example to broaden demand?
- *Influencing the **shape of the socio-technical regime***. For example, how do the above actions influence the politics and technological character of the regime? (Nye *et al.*, 2010). How transport systems could be transformed radically by 2050 for example with zero emission cars and light rail throughout Ireland as the norm.

Modal Shift

Persuading people to change from car usage towards cycling, walking and using buses and trains is challenging. Due to the economic downturn public transport demand has declined significantly, and it is not expected there will be significant investment in the area. Limited investment has taken place with regard to walking and cycling. And yet the Luas and Dublinbikes as perceived as assets to Dublin city by those who live there.[35] However, if further modal shift is required, there are barriers in encouraging people out of their cars. Some of these include the commitment to use the car once purchased, the rebound effect where better fuel economy may lead to greater use (Browne *et al.*, 2011).

Long-term barriers include:

- Lack of viable alternatives, particularly for those who would be willing to change;

[35] 'Your Dublin Your Voice', the first local government-led opinion panel in Ireland found that 98 per cent of people feel positive/very positive about LUAS, and 95 per cent feel the same way about dublinbikes and the proposed expansion of the scheme. Almost all respondents thought Luas and dublinbikes were good for the city. www.yourdublinyourvoice.ie

- Social expectations and norms, particularly among certain income groups and demographics;
- Cultural symbolism associated with private car ownership;
- Prestige and status associated with certain vehicle makes and models; and
- Loss of freedom or autonomy, i.e. perception that car ownership confers freedom, independence or escapism (Browne *et al.*, 2011).

Car consumption is never simply about rational economic choices, but is as much about aesthetic, emotional and sensory response to driving as well as patterns of kinship, sociability, habitation and work (Sheller, 2004). The affective and symbolic aspects (status and power) of car use are well known (Gatersleben, 2007).

Certain groups are more likely than others to drive more and use less fuel efficient cars. A survey of household consumption by the OECD in 2008 suggests that the travel behaviour of women, the young, the elderly, the less educated, those living in urban areas and those with lower incomes is more environmentally friendly, in the sense that such groups travel less, and particularly less by car. In addition, women, the young, those with lower incomes and those living in urban areas are more likely to drive smaller and more fuel-efficient cars (OECD, 2008). The OECD argued further in 2011 that:

> Above and beyond the effects of factors such as price and infrastructure, it is clear that the attitude of respondents toward environmental issues has an effect on personal transport decisions. These results indicate that a soft policy effectively influencing people's beliefs and attitudes to the environment would have a positive impact on substituting their car for an alternative mode (OECD, 2011: 115).

What policy measures might be effective?

The OECD conclude their survey of household behaviour and personal travel arguing that 'a combination of "hard" policies (e.g. taxes and regulations) and "soft" policies (i.e. which inform people's attitudes) is required to induce mode switching'(OECD, 2011: 116). Personalised travel planning has been shown to be effective in enabling particular travel choices. An evaluation of Smarter Choice in the UK (Sloman *et al.*, 2010)[36] found that car driver trips by residents fell by 9 per cent per person, and car

[36] Smarter Choice programmes were implemented from 2004 to 2009 in three British towns designated as 'Sustainable Travel Towns' intended to reduce car use. The towns spent most on personal travel planning, followed by travel awareness campaigns, promoting walking and cycling, and public transport marketing . Across the three Towns, a total of around 84 million km of car travel was taken off the roads each year, equating to estimated annual savings of more than 17,000 tonnes of carbon dioxide (CO2) (Sustrans, 2009).

driver distance by 5–7 per cent, according to aggregated household survey results for the three towns. This compares with a fall of about 1 per cent in medium-sized urban areas over the same period. Bus trips and cycle trips grew per person substantially. They concluded that the travel behaviour change in the towns involved a combination of mode shift (with unchanged destination); switch of destination and mode (e.g. replacing a medium-length car trip with a shorter journey by foot, bike or bus); and trip evaporation (not making a trip at all). Car driver trips fell least amongst people in full-time work (-5 per cent) or part-time/casual work (-2 per cent) and most by those who used their cars intensively such as those in full-time work.

The UK research found that students and people looking for work change their car use the most, with moderate reductions for retired people and those on 'home duties'. They note that the biggest behaviour change was among groups either at a point of change in their lives (e.g. at college, or looking for work, or age 66-70 and perhaps recently retired) or on a reduced income, or both. Sloman et al argue that:

> It is intuitively plausible, and consistent with previous research, that people who are in either of these situations are more likely to be receptive to changing their travel habits, if offered appropriate help and information' (: 42).

Achieving Societal Support for VRT Rebalancing

Some of the issues surrounding behavioural responses to VRT include:

- The rebound effect, where greater use of a fuel efficient car might reduce gains overall (Jevons paradox);
- Myopic consumers, whereby their willingness to pay for a far is little affected by changes in the expected fuel costs of using that car. This condition is not unique to cars (Busse *et al.*, 2012) (Hausman, 1979).

Browne *et al.,* review some of the potential barriers to public acceptance of tax measures in transport. As well as more general opposition to tax measures and concerns over data privacy and fraud, these include: concerns over equitable impact on lower-income communities; concerns over impact on rural communities; lack of prior public support or consultation, perception that scheme is designed to raise revenue, perception of unfairness, lack of alternatives, complexity of schemes, perceived injustice and impact on freedom and uncertainty over impacts (Browne *et al.*, 2011).

Encouraging a Greater Use of EVs

While there is a need for research on the specific barriers to EV use in Ireland, there is a limited number of EU and UK reports. A UK report for the Committee on Climate

Change found that high capital on cost remains the biggest barrier to EV adoption, followed by a concern over having a car with limited range and a concern over the lack of recharging infrastructure. People were concerned about not being able to travel long distances even if those journeys were rare. Solutions are emerging quickly. 'Better Place', a private company is building electric car networks in Denmark and Israel and has developed a model in which drivers bring their cars to a station and swap out empty batteries for fresh ones in less than five minutes.[37]

Element Energy argue that there is an innovation barrier that puts off the market but once 15 per cent uptake has been achieved, this reduces (Element Energy 2009). Very large CO_2 savings from EVs will only result if a very high proportion of total distance driven becomes electric. These results suggest that EVs will have to be made accessible to high mileage drivers in order to achieve the greatest carbon savings (:21).

Adopting Eco-driving Practices

Evidence shows that driver behaviour ('eco-driving') which includes driving more slowly, using a high gear, for example, can significantly affect the amount of energy and emissions from a vehicle and more efficient driving can reduce emissions by up to 10 per cent, with lower savings in the long-term, through driving more moderately, using on-board fuel monitors and avoiding rapid acceleration and excessive braking (Department of Transport, 2009). In Scotland, the Energy Savings Trust has used an awareness campaign over 3 years to highlight the benefits of eco-driving with advertisements such as 'the higher the gear, the lower the fuel consumption, drive more efficiently at ecodrivescotland.com.' They estimate that since they began, over 200,000 drivers have adopted eco driving practices, with one in ten Scottish drives saying the advertising has influenced their driving.

Table 4.1 presents some of the barriers to more fuel efficient driving (eco-driving).

[37] http://www.betterplace.com/

Table 4.1 Overview of barriers for applying a more fuel efficient driving style

	Examples
Individual Barriers:	Some drivers like to apply an aggressive (non fuel efficient) driving style
Social and psychological	Driving behaviour is habitual and therefore difficult to change
Knowledge-base barriers	Gathering information on fuel-efficient driving is perceived difficult
	Many drivers already think they drive well and do not realise the potential for improvement
	Drivers do not know exactly how to apply the tips and tricks for fuel-efficient driving
Societal (external) barriers:	The application of a fuel-efficient driving style may be hindered by traffic conditions
Structural and physical barriers	Some car types are more suitable to apply a fuel-efficient driving style
Cultural barriers	Peer group pressure to apply an aggressive (non fuel-efficient driving style).

Source: (Faber *et al.*, 2012)

It is acknowledged that many drivers are not aware of these cost-saving benefits. A Dutch eco-driving programme (Hoed *et al.*, 2006) has used most of its budget for awareness campaigns as well as driving school programmes over the last ten years and found that tyre pressure checking is not easily changed as a behaviour.

> Annual telephone surveys show no significant increase in tyre pressure checking by respondents. On the other hand, those respondents who are familiar with of the Ecodrive programme tend to check tyres more regularly. It may be concluded that the Ecodrive programme has had limited effect on the increased checking of tyre pressure by drivers (: 20).

They also found that 'direct training is significantly more effective in changing driving behaviour than communication and creating awareness alone'. One interesting aspect of this programme was the use of a 'network with representative stakeholders in the automotive and transportation sector. Not only has the network facilitated the set up of necessary structures (e.g. curricula, trainings) and dissemination (via the communication channels of individual partners), the network has also provided legitimacy and credibility of the programme. Finally, the network provided a good way of reaching the broad of stakeholders involved in ecodriving, from end-users to car dealers' (: 33).

While there tips available on eco-driving at the Sustainable Energy Ireland webpage (SEI Motoring Tips) and at www.ecodrive.org, an EU funded programme to promote eco-driving (Department of Transport, 2009), more could be done to achieve public interest in this and to make it easier for them to implement good practice.

4.5 Conclusion

This chapter has outlined some of the barriers to sustainable travel and potential measures to encourage different practices. This is a sector where technological innovation is likely to play an increasing role in supporting behaviour change, such as EV's, the use of smart phones for travel sharing, real-time bus information to encourage bus use. With limited resources available for large-scale public transportation initiatives, there is value in developing further demonstration projects across communities but also for communities of practice, referred to in Chapter 1, such as users of EV's, gathering available evidence and practice on social and behavioural supports, and sharing the learning for all communities.

Chapter 5: Farming Practice

5.1 Context of Farming Practice

The physical, social and cultural context is particularly important in appreciating the complexity of farming practices, and in particular, how they evolve and change in relation to the pressures of climate-change mitigation and adaptation. However, there has been insufficient focus on this complexity and the ways by which farming practice is shaped by different styles, locations and demographics.[38] Farming is a socio-cultural practice and way of life for many and not just an income generating activity (Department of Agriculture, 2012). Indeed, Macken-Walsh in her study of Irish rural development found that farmers had strong social and cultural attachment to their occupation (Casey & Holden, 2006: 12, Macken-Walsh, 2009).

Barnes and Toma (2012) note that there is a surprisingly small literature on farmer attitudes towards climate change in the UK (and this is also true for Ireland) and that which exists has been either at the generic or conceptual level or, where the work has been more applied, the focus has been on more vulnerable regions (Renwick & Wreford, 2011: 189). One study of farmers attitudes to climate change in Australia found there was diversity in views towards climate change and their relationship to adaptation and mitigation actions whereby different attitudes were associated with greater change in farming practices (Duffy *et al.*, 2011)

In relation to Scotland, Barnes and Toma (2012) surveyed close to 600 dairy farmers in 2009 and found that only 50 per cent perceive climate change as a problem for their business. This lack of concern might simply reflect the perceived wisdom that the impacts of climate change on Scotland itself may actually be relatively benign, but does highlight that there could be significant challenges to getting farmers to adopt mitigation measures (Palladino *et al.*, 2009).

A final factor outlined here is the role of the consumer. Hall and Dorai argue, in a paper for the OECD, that civil society and the market have been major forces in promoting green agriculture (Hall & Dorai, 2010). The Consensus study of household consumption has found that:

[38] For example, young Irish farmers have taken part in a EU wide best practice exercise. Twelve measures from four different countries (Ireland, Spain, The Netherlands, Sweden) were selected as case studies and analysed in depth by 24 young farmers. They looked at the social and economic context of the measures, and considered whether the measures could be applied in other countries. www.climatefarmers.eu.

> Irish householders appear to base their food purchasing decisions on largely tangible and pragmatic issues rather than on the more abstract and altruistic considerations of food sustainability.

They argue that this:

> suggests a gap between the esteem in which sustainable food is held and actual food buying, caused by issues of sustainability losing in the trade off of various values against one another. Respondents' perceptions regarding the expensive nature of organic and local food reflect the results of a recent OECD survey of over 10, 000 households across ten countries (OECD, 2011). This study noted that high prices appear to be the most important factor restricting market share of organic goods (Lavelle *et al.*, 2012a).

5.2 Social and Behavioural Issues in Farming Practice

A prevalent view is that environmental practices are embedded in most actions of farmers. And that they do participate—they did in large numbers in the REPS Rural Environment Protection Scheme. However, there are challenges in increasing the large-scale take-up of measures, some of which are specific to the particular measure, but most are already recognised challenges or barriers which are common to other strategies for change. For example, Macken-Walsh in her study of barriers to change in relation to farming practices and rural development, found it useful to examine barriers in terms of:

- Economic capital (material wealth) (e.g. a lack of resources or time);
- Social capital (social networks) e.g. social and community-based networks; and
- Cultural capital (prestige, matter and action). For example, shared understandings of what is like to be a 'good' farmer, prestige through particular practices (Macken-Walsh, 2009).

She found that farmers and fishermen attributed significant importance to the community-based networks, conventions and practices that underpinned their livelihoods (: 16). For example, in reaction to new rural enterprises such as farmers markets and artisan foods, she reported a prevalent view among farmers that this was 'not for farmers'.

Riley (2008) argues that in relation to a study of farming practices in England, rules and moral orders are established over time, e.g. farmers saying 'we don't want to be like "Old George," comparing their practices with a farmer notorious for his poor haymaking practices.' Past practices in this case provided a moral framework for current action (Yan *et al.*, 2012: 1286).

This is useful in considering barriers and enablers to climate-change mitigation in the farming community, which to be effective needs to be understood as more than being about economic capital. In relation to Scottish farms and climate change, Renwick and Wreford argue that a key finding was that even if adoption provides financial benefits to a farm, a range of other social and cultural factors will actually determine whether a measure is adopted (Renwick & Wreford, 2011: 189).

An OECD report on farmer behaviour identifies three types of barriers to behaviour change:

- External (top-down barriers);
- Internal (habits and cognitive processes); and
- Social factors (societal norms, and cultural attitudes) (OECD, 2012).

Knowledge of these will play a role in identifying areas for further effort to bring about increased change in farming practice. However, they fall short of helping us to fully appreciating the contextual and complex factors that shape farmers' decisions to participate fully or not.

Farming as a Socio-Cultural Practice

Whether or not farmers adopt sustainable practices is not fully explained by an analysis of barriers, irrational behaviour or market failure. Less attention has been paid to the understandings that are embedded in the actual farming practices that are at the heart of environmental concern and agricultural policy change (Yan *et al.*, 2012: 1282). It is not as useful to find out the barriers to action as it is to properly understand the legitimate reasons for inaction (Department of Agriculture, 2012: 16). Behaviours are embedded within different contexts and situations and are linked to institutions, social networks and the contexts of place. Behaviour change is not a one by one persuasion task but a social challenge (: 17).

Knowledge about how social responses are generated in agriculture offers a new perspective in how to create alternative, more positive responses and hence facilitate change (Styles & Jones, 2004: 12). They argue that there is no such thing as a barrier to change only legitimate reasons not to change. A social focus on behaviour change is more useful in relation to facilitating action for climate change than a focus on the specific barriers to change, because it is only through a social approach that the 'practice and discursive constraints of context, both locally and nationally can be properly addressed (Styles & Jones, 2004: 215), (Purvis *et al.*, 2011).

Effective Strategies and Principles

While this is a newly emerging area for research, there are a few key strategies and principles which will be of value in this area. The OECD conclude that four main policy implications of their study of farmer behaviour are:

- A holistic approach is needed—consider habits, cognitions, norms and market based instruments together;
- Understand behaviour change at a local level—size, location, type of farming practice;
- Use 'nudging' (small reminders for behaviour change) e.g. visualisation policies such as labelling 'sustainable farms;'[39] and
- Forming networks of farmers—communities pledge to collectively plan /information on others choices and benchmarks. They argue that it is important not to 'crowd out' civic motives but encourage intrinsic motivation to take part. Need to involve local people centrally as decision makers in the design and implementation of developmental actions (OECD, 2012).

5.3 Extension Practices

Ireland has had considerable experience of agricultural extension advisory services through Teagasc, the main provider of extension services in Ireland, has played a vital role in 'shaping modern agriculture' and in particular the 'practices of farm families' (ICMSA, 2011: 2, Farrell *et al.*, 2008). While approaches to extension practice has changed in recent years, particular types of approach have been critiqued in relation to this programme, where they found some evidence that 'rather than taking a reflexive approach to changing policy and operational circumstances, advisers tend to remain attached to traditional modes and procedures of advice delivery'(Farrell *et al.*, 2008:8). Furthermore, what emerges is the importance of programme evaluation and the realisation that the willingness of farmers to explore their 'options' is very dependent on the way in which knowledge is disseminated to the farm family and the levels of engagement at which the extension advisory service operate. Consequently a 'one size fits all' approach (Schulte & Donnellan, 2012) has become less pertinent and is no longer a suitable method of disseminating valuable knowledge and information to farm families (Farrell *et al.*, 2008).

[39] They argue that labels prove to be particularly effective if they identify both 'public' and 'private' benefits. People are more likely to respond to eco-labels if the environmental benefits co-exist with more direct personal benefits for the consumer, for example, the personal health benefits which many respondents associate with the consumption of organic food.

Farrell *et al.,* review extension practice in relation to The Options for Farm Families Programme and conclude that there were problems of programme awareness and levels of participation; paternalistic delivery methods and prescriptive rather than consultative structures under which the programme operates. Furthermore what emerges is the importance of programme evaluation and the realisation that the willingness of farmers to explore their 'options' is very dependent on the way in which knowledge is disseminated to the farm family and the levels of engagement at which the extension advisory service operate (Farrell *et al.*, 2008).

In a re-visioning of extension practices in Australia, Vanclay has argued that extension practice could usefully be understood as enabling change and not just transferring knowledge to farmers (Department of Agriculture, 2012). He outlines some key principles for better understanding of farming practices (see Table 5.1).

Table 5.1 From Key Principles for understanding farming practices Vanclay (2004)

Principles	
Farming is a socio-cultural practice and not just a technical activity.	It is hard to be green when you are in the red.
Farmers are not all the same but have different styles of farming. The stage of the lifecycle is key.	Doing the 'right' thing is a strong motivational factor. Different farmers have varying notions of 'good' farm management—it is a dynamic social concept.
Adoption is a socio-cultural process—becomes a social norm and part of 'good' farm management.	Farmers don't distinguish environmental issues from other farm management issues.
Profit is not the main driving force of farmers. Appealing to income incentives along is not sufficient to bring about change.	There is a strong desire to hand the farm over to one's children. This rationale exceeds any economic motivational decision.
Sustainability means staying on the farm so is already central to farmers.	Women are an integral part of the farm and can play a key role in new practices.
Farming extension practices have changed, older ones contributed to problems today, not farmers resistance. Non-adoption is not the cause of land degradation.	It is not the case that only supporting the innovative and leading farmers will contribute to a trickle down to others—we can't be complacent at changing only a small proportion of farming practice.
Farmers attitudes are not the problem. They may have different views on what environmental management means.	Farmers construct their own knowledge. Farmers are their own scientists, theorising and applying local knowledge, experimenting to see what works.
Effective extension requires more than a transfer of technology but it requires an understanding of the world view of farmers.	Farmers have legitimate reasons for non-adoption including lack of flexibility, profitability, too complex, not compatible with farm and personal objectives, capital outlay is too high, risk and uncertainty is too great, too much additional learning is required; there is conflicting information; they don't see that there is a problem; lack the physical or social infrastructure;.

These principles have considerable potential and relevance for Irish farming practice and extension services to support behaviour change among farmers. Many of these echo other work, from the OECD and others, on strategies which would be effective in this area. The demonstration of practical ways forward and the provision of social contacts and the framework for networks as being the most beneficial (Styles & Jones, 2004: 17).

Recognising the role of local knowledge and capital in its traditional, social and cultural forms as primary resources for these areas of development is perhaps the most effective route for improving the circumstances of farmers' and fishers' engagement (Casey & Holden, 2006: 20).

Developing Capability and Peer Support

A potential strategy for increased 'buy-in' among farmers is to foster and support peer groups in local areas to 'learn by doing'. One example of the potential value of this is documented in Pelling *et al.* (2008). They describe the activities of Grasshoppers a Welsh dairy farmers group with 20 members. It was established in 1999 to explore what they know as the New Zealand grazing system. Through monthly farm visits where members scrutinise each other's farm management strategies, helps to build shared understanding and is now 'rooted in a culture of inter-personal trust. This has fostered social learning and joint innovation'. New members are recruited by invitation, reinforcing the shared and distinct group identity. They found that this group helped shape 'adaptive capacity'. 'It stands in contrast to many other farmers who feel stuck, unable to make or even see the changes they need to remain viable' (Pelling *et al.*, 2008: 20).

In an Irish example where changing practices is becoming the norm, is set out in Box 5.7.

Box 5.1 Glanbia Ingredients Ireland

In June 2012, the Secretariat visited Glanbia Ingredients Ireland (GII), one of Ireland's leading dairy-based ingredients companies. GII views the drive to reduce energy costs and environmental impact as key to future growth. To support this it has created a very sophisticated process by which it assists farmers to farm more efficiently and reduce emissions. The project was supported by Bord Bia and the methodology and calculations were accredited by the Carbon Trust in the UK.

There is a Code of Practice which supports continuous improvement on farms. This includes things that famers must do and should do. Independent audits will be used to determine is standards are reached. There is also an education and awareness programme to introduce the code of practice, explain how it works and highlight its impact on farms particularly the scope to reduce costs. It allows farmers to assess their performance relative to national benchmarks and with local peers. In addition, farmers receive a visit from in-house advisers working with the company who provide advice based on detailed analysis of the audit and ongoing performance data for the farm.

Having completed a pilot programme, GII are planning to roll out this initiative to all of its milk suppliers over 2013/14.

5.4 Conclusion

There is considerable scope for the use of social and behavioural evidence and practice to support changing farming practice. Mitigation for this sector is largely dependent on behaviour change to be effective. Understanding that such practices are shaped by social, cultural and geographic contexts such local ways of doing things, demographics and farming traditions is important for long-term change. The evidence from Australia and internationally, as outlined from the OECD, is that farming practice has a key role to play in climate-change action and work is moving this further in Ireland to achieve excellence in sustainable agricultural practice.

Towards a Carbon-Neutral Society

Chapter 6: Thinking About Long-run Transition

6.1 Transitions

To understand a long-run transition, particularly one as multi-faceted as moving towards a carbon-neutral society, it is necessary to draw from a wide range of perspectives and approaches. These range from energy and technology road maps and modelling techniques, considered in another NESC Background Paper (Finn, 2012), to a wealth of theory and research on changing behaviour and social practices and societal transitions. This paper outlines some of the main approaches and draws together some core elements of a strategic approach to transitions, including insights from earlier work, *Ireland at Another Turning Point* (NESDO, 2009).

Transitioning, the passage from one state, stage, subject, or place to another,[40] encompasses technological and scientific developments as well as social practices and behaviour. It is extremely challenging to understand the potential the transformative impact of such change and the inter-relatedness of technology and social practices. For example, the impact of the mobile phone on the global and national landscape as much as on individual lifestyles. Asking us to consider this back in the 1980s, we would not have envisioned the extent to which the mobile phone would become so personalised to our business and social needs through 'apps', for example. It is only with the benefit of hindsight, therefore, that we can spot transitions clearly (Koppenjan *et al.*, 2012: 8). Nevertheless, there are useful insights and analysis that can help inform decisions for future policy.

In seeking to understand how current action may shape future options for a carbon-neutral society, a useful approach is to consider transitioning as a path of development based on new practices, knowledge, social organisation and different guiding principles (Kemp, 2005). Such a transition involves fundamental social, technical, political and institutional change (Rotmans *et al.*, 2001). Transformative change of this kind, will necessarily involve all levels of society, from government to grass roots action. Viewing it in this holistic way gives rise to both integrated policy frameworks and new forms of multi-level governance. Designing policy requires an understanding of the complexity of transitions to be effective (Gaede, 2010).

[40] http://www.merriam-webster.com/dictionary/transition

As Loorbach (2004: 2) outlines:

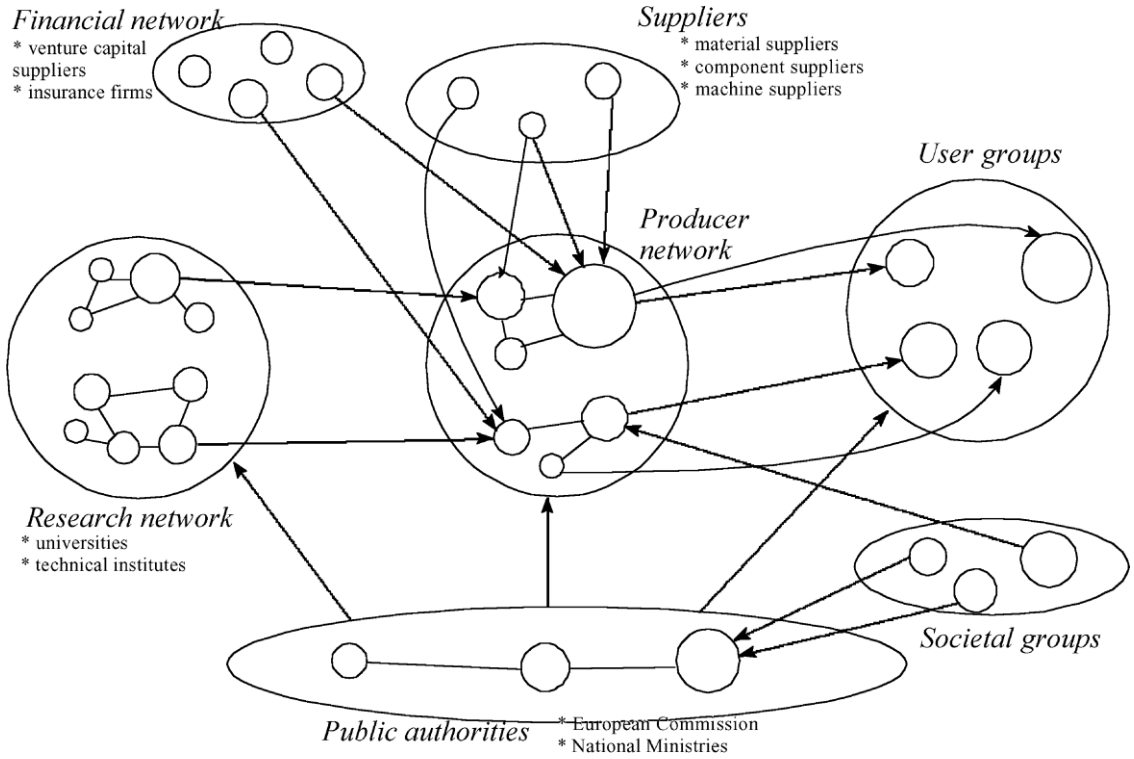
> Transition processes are long term (over 25 years) processes of change that are co-evolutionary by nature and involve a broad range of societal actors. Transitions are therefore always the result of interacting economic, social, technological, institutional and/or ecological developments. By definition, transitions are not caused by single events or developments but always have a number of causes that interact.

A historical look at past transitions is revealing. Geels (2005) identifies several key transitions such as sailing ships to steam ships 1780-1914; high death and birth rates to low ones (2nd half 19th century); horse-drawn carriages to automobiles, and the shift from coal to natural gas for residential heating (1960-1975). Like innovations, transitions are often not successful and depend on many factors. These include: the nature of the transition; the external opportunities and conditions; the presence of entrepreneurs and a supportive coalition; weakening of resistance from those with vested interests in the old regime; degree to which knowledge is shared; and the legitimacy of the transition which derives from a broad consensus regarding its urgency and direction (Koppenjan *et al.*, 2012).

To further understand transitions, and drawing from the past, Geels distinguishes between the following concepts as part of a multi-level perspective at the levels of: *sociotechnical landscape* (overall societal setting and worldviews); *sociotechnical regimes* (dominant socio-technical systems and practices); and *niche-innovations* (experimental front-runners) (Geels, 2005). Radical innovations occur in niches, which act as safe environments in which breakthrough developments can grow, sheltered from the selection process that occurs at regime level. Niches also provide space to build the social networks which support innovations, e.g. supply chains, user–producer relationships (Geels, 2002: 1261). A regime may host a range of niches which generate innovations to challenge the status-quo. Changes at the landscape level, may put pressure on the regime, and create openings for new technologies. Each of these levels can be the levers for transformational change, but most often, it is developments at a niche level, which changes the regime and finally the landscape.

Figure 6.1 shows the multi-actor network involved in socio-technical regimes (Geels, 2002):

Figure 6.1 Multi-actor network involved in socio-technical regimes.



Source: (Geels, 2002: 1260).

Viewing transitions in this way leads to key questions: What innovations at a niche level might be the basis of a future carbon-neutral society? What are the institutional, organisational and support supports needed for niche innovations to become regime changers? And what are the social practices and socio-technical systems at a regime level which may transform the socio-technical landscape? The following section outlines a contemporary governance approach to managing transitions and seeking to address these questions.

The role of multi-level governance and effective communication become central.

6.2 Multi-level Governance

There are considerable governance challenges in transitioning towards a carbon-neutral society, given the complexity and uncertainty of climate change. A working paper for the OECD has outlined how:

> advancing governance of climate change across all levels of government and relevant stakeholders is crucial to avoid policy gaps between local action plans and national policy frameworks (vertical integration) and to encourage cross scale learning between relevant departments or institutions in local and regional governments (horizontal dimension) (Corfee-Morlot *et al.*, 2009: 2).

Meuleman argues that the governance of complex societal problems requires dynamic mixtures of hierarchical, network and market styles of governance, which allows variation in time, in place, and in the roles of governmental and non-governmental actors—in other words, what might be called meta-governance (Meuleman, 2010: 12). As outlined in another of our Background Papers on reframing climate policy, of importance here is a polycentric approach so that such governance provides greater opportunity for experimentation, choice and learning.

> In practice, a transition to low-carbon systems of energy supply and energy service provision will require radical changes to technologies, institutions, business strategies and user practices; hence, it raises governance challenges in relation both to the engagement of different actors and to the incentives and barriers they face (Foxon & Pearson, 2011: 2).

There is a challenge in developing such a multi-level governance approach, while at the same time having a strategic and integrated approach to policy. This was noted as a barrier to effective governance in *Facing up to Climate Change*, a Scottish inquiry on barriers to becoming a low-carbon society:

> We took evidence across Scotland and our single most important finding is that change is held back by the lack of coherence and integration of policy at different levels of governance. There is activity at the level of the EU, the UK Government, the Scottish Government, local authorities, local communities, households and civil society. But there is often a disconnection between policies at different levels. This impedes progress to a low-carbon society and also leads to a lack of trust among the general public (The Royal Society of Edinburgh, 2011: 8).

As well as policy disconnection, a further key message from this work is that it is important to take action at all levels to reap the benefits of a low-carbon society. It requires a fundamental shift in the organisation of society and how resources are used, and calls for engagement with all sectors of society. They conclude that everyone has a part to play in seizing a once-in-a generation opportunity (The Royal Society of Edinburgh, 2011:8). However, there has been little debate on the role of civil society in bringing about a low-carbon transition to date (Foxon & Pearson, 2011).

In practice, there is a no standardised approach at city and county level with regard to climate change (CCMA, 2008). As of recently, six local authorities have published their Climate Change Strategies and 22 others are 'working with their local energy agencies to implement climate change strategies at local level' (Association of Irish

Energy Agencies)[41] and some adhere to best practice guidelines such as those presented by the County and City Managers' Association (CCMA, 2008).

In a paper examining the role of multi-level climate policies in Ireland, McGloughlin and Sweeney argue that there is no statutory requirement for local authorities to mainstream climate change and no formal climate-related responsibilities designated for regional authorities (McGloughlin & Sweeney, 2011:14). 'The fragmented sectoral approach to government presents key policy challenges since climate change impacts are cross-sectoral and are best served with integrated approaches' (p. 14). In their research, they found that some of the barriers local authorities experienced in addressing climate change were noted as having been a lack of funding, no nominated champion to drive it forward, lack of awareness or interest from councillors and other issues taking a higher priority. They argue that national level policies are not translated to local development plans and indicates a lack of vertical integration regarding climate related policies (p. 11).

The potential for local government in climate action is well outlined in a recent UK report by the Committee on Climate Change (2012), *How Local Authorities Can Reduce Emissions and Manage Climate Risk*. 'Through their functions as service provider, social housing owner, community leader, planning authority and regenerator co-ordinator, local authorities have significant scope to influence emissions in buildings, transport and waste, particularly in energy efficiency in residential buildings' (p. 8). There are local benefits in doing so including lower energy bills, economic regeneration and creation of local jobs, improved health, enhanced green spaces and increasing resilience to climate change risks thereby avoiding costs from flood damage.

In the next section we outline Transition Management, which offers one credible approach to multi-level governance.

Transition Management

Transition Management, was developed in the Netherlands and is used by the Dutch government among others. It is concerned with how to govern transitions to more sustainable socio-technical systems (Smith & Stirling, 2008: 7). The premise of Transition Management is that efforts to govern transitions to sustainability *can* and *need to be* made despite the uncertainties and complexities in place (Frantzeskaki *et al.*, 2012). The overall aim of this approach is to generate momentum for

[41] The Association of Irish Energy Agencies is an all-island body engaging with local authorities and the communities they serve to meet energy performance targets through professional development and implementation of best practice.

sustainability transitions through establishing a vision and then policy choices are made along the way on the basis of learning experiences at different levels.

It is situated between two views of governance—the bottom-up 'learning by doing' approach and the top-down blueprint planning approach. It provides a cycle of policy activities as well as identifying 'layers' where action is needed. The cycle involves a range of tasks. These include structuring the problem and envisioning the goal, defining 'transition pathways' and experiments (such as a focus on energy or mobility, for example) learning and adaptation (reflecting on the learning from experiments), and the final activity of institutionalising the new practices and changing behaviour (the most challenging part of the cycle).

Transitions can be viewed as being made through a series of decisions by actors at branching points, reinforcing the existing pathway or causing a branch to a new one (Arapostathis *et al.*, 2012). Branching points are points at which choices made by actors, in response to internal or external pressures, determine whether and in what way a pathway is followed or not.

The levels of action include engaging with stakeholders and developing long-term goals for the future, while building coalitions for particular regimes (e.g. energy, mobility/transport), and 'learning by doing' on the ground. Table 6.1 indicates these levels:

Table 6.1 Transition Management Levels and Policy Actions

Levels	Policy Actions	Timeframe
Strategic (Landscape)	Visioning, strategic discussions, long term goal formulation at a societal/culture level.	Long Term, 30 years
Tactical (Regime)	Processes of agenda-building, negotiating, networking, coalition building, examining structures, institutions.	Mid-term 5-15 years
Operational (Niche)	Experimenting, implementation on concrete projects and practices.	Short-term 0-5 years

Source: (van der Brugge & van Raak, 2007)

A transition 'arena' (protected niche) is an area where experiments can flourish and may become part of a future regime/ system. Small scale stimuli can have high impact and bring about radical change, so the build-up of incremental changes matters (Frantzeskaki *et al.*, 2012). Smith and Stirling (2008: 8) elaborate on the potential of niches:

> Transition management focuses on nurturing strategically designed experimental niche settings where: teething troubles are tolerated, new ways of

> doing things are valued; learning is encouraged and embedded in future development. Crucially, there is a coupling with supportive institutions to further develop the more promising nascent socio-technical practices by facilitating wider and deeper alignments (Hoogma *et al.*, 2002).

Transition Management can be a potentially useful mode of governance for achieving sustainability as it:

- Makes the future seem clearer in current decisions (despite uncertainty);
- Transforms established practices;
- Develops iterative processes that constantly self-assess and re-adjust;
- Links technological and social change;
- Emphasises learning by doing; and
- Encourages a diversity of approaches rather than a single, centralised plan (Meadowcroft, 2009: 158, Evans, 2012).

However, there are other considerations worth noting in relation to transitions. Innovation does not always have to involve the creation of new technology (e.g. wind farms based on the reinvention of the windmill around an old technology (Evans, 2012: 160); nor does it have to be technologically focused—social innovation in relation to public health, for example.

A further critique of Transition Management is that it assumes that the energy regime can be managed to some degree, apart from other related spheres of society. However, the legal, social and political aspects of transition need also to be considered (Evans, 2012).

Transition Management in Practice

In Ireland, the Consensus Project has used Transition Theory to frame a series of workshops on future sustainable heating and washing practices (Doyle & Davies, 2012). See Box 6.1.

Box 6.1 ConsEnSus Project

The ConsEnSus (Consumption, Environment and Sustainability) Project is a four-year research project involving collaboration between TCD and NUI, Galway funded by the EPA under the STRIVE programme. This project focuses on four key areas of household consumption: transport, energy, water and food (Lavelle *et al.*, 2012c). The project uses backcasting42 in an all-Ireland context as 'an innovative, creative means of developing alternative scenarios for sustainable household consumption and long term action plans to work towards their achievement' {Doyle, 2012 #779). A stakeholder Visioning Workshop focused on the question; 'what kinds of technological, organisational and socio-cultural innovations can we envisage in the year 2050 that might fulfil the needs of personal washing (cleanliness, refreshment, relaxation) more sustainably? In relation to home water consumption, three areas emerged in relation to a low-carbon society: adaptative and low water washing; efficiency and valuing of water and connection to nature. These workshops and their resulting frameworks provide useful examples of this aspect of transitioning in practice.

While offering a structured and participative process to manage transitions, there is a lack of empirical evidence as to the effectiveness of Transition Management as yet (Koppenjan *et al.*, 2012) and it is not without its critics (Shove & Walker, 2007). However, it is useful in that it emphasises the role of policy experimentation and policy reflexivity (self-critical reflection) and the value of learning by doing. It is the reflexivity of the process, and learning from experimentation, that marks it out from conventional governance, if it can be achieved.

While such an approach shows how structures and processes can be put in place to support a transition, it does not fully consider the social and behaviour challenge that transitioning raises. Furthermore, such an approach cannot be viewed as the only approach to transitions, or that such transitions can be fully understood or managed, given existing theories of change and key perspectives such as an understanding of paradigm shifts and how revolutions [in science] come about as the result of breakdowns in intellectual systems, breakdowns that occur when old methods won't solve new problems (Kuhn, 1962).

Transition and Innovation

These ways of thinking about transitions resonate with NESC's previous work on innovation. The transition approach, as outlined here-innovation required across multiple levels, the governance challenges in dealing with complexity and uncertainty, and the inter-relationships between state, business and society- echoes key findings which emerged from some of our earlier work, *Ireland at Another Turning Point* (NESDO, 2009). This was the report from a foresight exercise designed to examine the conditions that would support Ireland's transition to a learning

[42] Looking back to see how a transition towards future scenario can be achieved (Doyle & Davies, 2012: 2).

society.[43] The project drew together the views and experiences of 183 innovators from all sectors of Irish life and found they were innovating in practical ways and solving problems, despite numerous difficulties. The report argues that Irish people are ready for much greater innovation, more widespread learning and richer accountability, but the capabilities and practices that support these are inhibited by features of our organisational system. Addressing these, would provide the basis for an effective transition to become more innovation-driven.

Given the strong resonance with the transition to a low-carbon society, the four key findings from this work are outlined below:

i) New forms of cross-fertilisation between the economy, society and public governance are increasingly evident, enhancing the ability to learn and innovate.

The integration between the spheres of economy, society and public governance is changing to take the form of cross-fertilisation. Each requires the development and use of capabilities across the spheres of business, society and the public system, and at three levels—institutional, inter-personal and personal. Ideas, practices and methods, invented in one sphere, are frequently adopted in other spheres in order to address difficult problems. Table 6.2 shows how evidence was gathered across these three levels.

Table 6.2 A Framework for Cross-fertilisation

	Social Integration and Creation	Public Governance	Business/Wealth Creation
Institutional			
Inter-personal			
Intra-personal			

Source: NESDO (2009)

ii) Innovation and learning are systematic, almost always combining initiative, disciplined review and a willingness to confront challenges at three levels—institutional, inter-personal and personal.

Innovation and learning almost always involved three basic stages: getting started on a troublesome problem, reviewing experience in a disciplined way and confronting challenges at the three levels outlined above. Where innovation occurred in a

[43] A learning society is one in which there is a widespread ability to find new solutions, deal with uncertainty and ambiguity, learn continuously from experimentation and turn technological possibilities into enduring prosperity and well-being (Information Society Commission, 2005).

context of uncertainty and ambiguity, it took on an additional meaning, as it involved taking initial steps without a solution to the problem at hand, sometimes without a sure sense of how the problem should be understood.

iii) Systematic review provides the basis for both innovation and accountability, which is particularly relevant in a period when we seek more stability and accountability and yet face radical change;

Systematic review refers to a range of techniques and processes that were used by innovators to consider ways of improving and changing what they do. Innovation, in the evidence gathered, was rarely separated from performance and efforts to continuously improve. Innovators used a range of techniques—such as continuous improvement, quality frameworks and various customised processes—to ensure that they learn from what they do on an incremental and continuous basis. Improvement based on continuous review is not confined to periods of stability and certainty; it is often prompted by crisis and uncertainty and can be part of the resolution of crisis. Learning involves use of in-depth review to confront challenges at organisational, inter-personal and intra-personal levels.

iv) The kind of innovation and learning we have found cannot flourish, and cannot yield their full harvest, without profound change to our organisational systems, particularly our systems of control and accountability.

Certainly, the evidence strongly suggests that local learning can help recast over-arching policies and programmes. In a context of ambiguity and uncertainty, the critical developmental requirements are institutions capable of searching out problems and solutions. There is overwhelming evidence that those involved in the application of rules and standards, in local delivery and in implementation of policy and partnership need to have sufficient freedom to respond to differences in context and to innovate. The fact that, for example, many policies and activities addressing complex problems can only be determined in the process of doing them, suggests the need for widespread experimentation. For this to work, they must be able to show that they can use this increased freedom to improve outcomes and comply with legitimate norms.

These findings complement a transitioning perspective, emphasise the cross-fertilisation necessary for innovation, regime and societal change.

A final point is to consider how innovative practices spread across a society. Rogers in his 1962 book *Diffusion of Innovations*, argued that the diffusion of innovation through society often begins with early adopters. He suggested five categories of

adopters: innovators, early adopters, early majority, late majority, and laggards (Rogers, 1962:150). Ideas are introduced through opinion leaders within a given community and change agents from outside the community. It is worth considering this in relation to the challenge of mainstreaming sustainable innovations. One interesting example to follow is the current trial use of electric vehicles run by ESB and to see if the diffusion of this practice will be sufficient to influence the early majority and so on to the rest of society.[44]

6.3 Conclusion

Our review of research and international and local experience in dealing with change suggests three areas have value in thinking about long-run transition:

i) Learning and Review

- Foster systematic innovation and learning, combining initiative, disciplined review and a willingness to confront challenges at three levels—institutional, inter-personal and personal;
- Combine expert knowledge with learning by doing; and
- Systematic review on ways of improving and changing practices.

ii) New Forms of Governance

- Key role for networks and agency;
- Reflexive governance, experimentation with regular review;
- Combine a long-term vision with short and medium-term actions;
- Interact with key stakeholders throughout a transitioning process; and
- Communicate effectively and engage with the public to build support.

iii) Action Across All Levels of Society

- New forms of cross-fertilisation between the economy, society and public governance, enhancing the ability to learn and innovate.
- Recognise the key role of changing behaviour and social practices in a transition; and
- Profound change to our organisational systems, particularly our systems of control and accountability.

[44] http://www.esb.ie/electric-cars/electric-car-news-and-events/electric-car-press-releases/Great-Electric-Drive-from-ESB-ecars.jsp
http://www.siliconrepublic.com/clean-tech/item/31254-dublin-taxi-driver-claims-e

- Diffusion of innovation may work best by targeting key sectors as early adopters.

The following chapter now considers the important role of societal engagement in climate change mitigation and in the transition to a carbon-neutral society.

Chapter 7: Societal Engagement

7.1 Introduction

Encouraging greater engagement over climate change among the public is an important part of climate action. This engagement can take the form of raising awareness, environmental education, increased participation in environmental decisions, and direct involvement in climate action. In terms of awareness, areas such as climate science, mitigation strategies, the benefits and risks of climate change and how future adaptation might impact on Ireland are all central educational elements to this. In addition, how policy measures are communicated will have an impact on their effectiveness. This chapter examines some of these areas: communicating effectively and engaging all levels of society.

7.2 Communicating Climate Change

Achieving a policy vision for a carbon neutral society will require support from all sectors including business, householders, community organisations and voluntary groups. While more sustainable living is part of such a vision, combining it with other motivations, such as economic growth, healthy lifestyles, and resilient communities may be more effective.

Given the key role of behaviour change to the success of climate policy, it is important climate policy is effectively communicated at all stages from establishing a vision to delivering policy measures.

Comhar has previously outlined the importance of communicating climate change and the role of behaviour change (Comhar, 2007). They outlined:

> Communication of climate change is a vital part of the strategy and there are three principle strands to its implementation:
>
> First, individuals and all sectors need to be persuaded of the need to integrate carbon estimation into everyday decisions; Second, the information must be made available on the carbon impact and consequences of decisions in order to enable people to do this, i.e. product carbon-labelling, climate change information, emissions databases, price of carbon, availability of grant schemes; Third, communication should be a two-way process. Different stakeholders should be encouraged and enabled to provide feedback to Government about the efficacy or otherwise of climate-related policies and measures. Government agencies should likewise be able to respond actively, for instance by promoting

> best practices or raising awareness about any contradictions between policies (Comhar, 2007:5).

There are insights from the social and behavioural literature on how best to do this. This section will examine some of the key ones:

- The value of effective communication;
- How to effectively communicate?; and
- Engaging all levels of society.

i) The Value of Effective Communication

A key role for governance in a low-carbon transition is to make a low-carbon society, and its social and economic advantages, "real" for people (The Royal Society of Edinburgh, 2011:10). Given the uncertainty and potential risks involved in climate change, it is a complex and challenging subject to convey effectively by governments. Owens has argued that 'in both energy consumption and transport, people may perceive that they have neither the prime responsibility to take action nor the agency to have much effect' (Owens, 2000:1143).

Some Irish campaigns such as The Power of One (SEAI) have been successful in raising awareness but not so much changes in behaviour. A recent EU initiative is a European Commission campaign to promote climate action, *A World You Like for a Vision You Like*[45] which emphasises action across all levels from individuals, business and governments. One innovative aspect to this campaign is the gathering of case studies and successful stories across the EU to share good practice and promote innovation. However, it is difficult for broad-based awareness-raising campaigns to change behaviour without some local engagement.

The Royal Society of Edinburgh Inquiry argues that:

> A collaborative, rather than individualised approach to changing public attitudes and behaviour is more likely to be effective in engendering change. It creates a momentum, and capacity, for transition through informed, substantive public engagement (The Royal Society of Edinburgh, 2011:20).

Nevertheless, effective communication can help to create a sense of fairness in resulting policy measures. This can be a powerful force in driving behaviour and people moving away from an individualised frame towards one that puts their actions in the context of a large scale endeavour (Green Alliance, 2012). It is also important to make climate action relevant to people's lives. Spence *et al.* argue that making climate change closer psychologically and the potential impacts relevant to

[45] http://world-you-like.europa.eu/en/explore/

people in terms of their location, social group and other demographics, is also important:

> Framing climate change in terms of local events and geography will help to make the issue more salient, will promote emotional and cognitive engagement with climate change and will make the benefits of acting on climate change more tangible (Spence *et al.*, 2012: 959).

How to Effectively Communicate?

There is no single best approach to communicating climate change, however, the following considerations may be useful. While providing information has value, relying on passing on the 'right' information and expecting behaviour change responses has proven to be unrealistic. Instead, (Moser & Dilling, 2011) argue, citing wide-ranging research evidence, that deeply held pro-environmental values and beliefs, incentives, perceived benefits, skill and a sense of efficacy, social support, peer pressure, and practical assistance have been shown to foster behaviour change (Downing & Ballantyne, 2007, Gardner & Stern, 2002, Takahashi, 2009). They further add that:

> even concerned individuals ready and willing to act on their conviction that climate change is a problem may encounter obstacles. For example, getting an energy audit for one's house but no help in prioritising, how to select a contractor, finance the work and navigate other problems involved in retrofitting a home can thwart the intentions of even the most committed (:164).

How climate change is framed can have an impact. Communications should underscore the human causes, that solutions exist to address it, and that it should be acted on now (Lorenzoni *et al.*, 2007). However how the message is delivered is complex. Some key elements include: the emotional impact, wider impacts of the message and trust. For example, linking action on climate change to positive moral emotions such as pride and gratitude can provoke a pro-social response that rewards respondents with feelings of well-being.[46] There is evidence to suggest that strategies which utilise less visible mechanisms and non pro-environmental messages can effect change (Southerton *et al.*, 2011). Trusting the messenger is key to effective communication—governments are expected to lead by example to adopt measures and to take climate change seriously. Department league tables for energy efficiency, used in England, create competition and are reducing energy use.

An environmental think-tank in the UK, the Green Alliance, has argued the case for delivering a strong narrative for all actions on climate-change announcements and

[46] http://www.irishtimes.com/newspaper/opinion/2012/0903/1224323533104.html

measures; a plan detailing how government and individual action over the next five years will contribute to that; and clear examples of what individuals can do (Green Alliance, 2012: 23). They argue that this can be achieved by:

- Building greater visibility and consistency for messages;
- Enabling trusted messengers to communicate;
- Providing coherence and cohesion to practical action;
- Avoiding a vacuum for negative stories;
- Providing the bigger picture;
- Changing what people see as normal energy behaviour; and
- Helping to avoid the rebound effect, where financial savings through energy efficiency contribute to greater energy use elsewhere (Green Alliance, 2012: 19).

Policy makers are not the only ones called to put communication centre stage. The scientific community are reflecting that more needs to be done to communicate the complexities of climate change as well as the potential benefits of mitigation. Somerville and Hassol argue:

> We can improve the chances that the public will hear and accept the science if we include positive messages about our ability to solve the problem. We can explain, for example, that it's not too late to avoid the worst, lower emissions will mean reduced climate change and less severe impacts. We can point out that addressing climate change wisely will yield benefits to the economy and the quality of life (Somerville & Hassol, 2011:53).

Finally, rather than focusing on mitigation, concrete adaptation goals can be more tangible for people, than emissions. It means engaging people over landscapes that are valued by them; emissions are too abstract and represent someone else's problem. Adaptation doesn't require national consensus so it affords varied opportunities to act (Prins & Rayner, 2007).

However communication is only one part of broader transition governance and action. For 'communication to be effective in leading to active engagement, it must be supported by policy, economic, and infrastructure changes that allow concerns and good intentions to be realised' (Moser & Dilling, 2011:169); (Ockwell *et al.*, 2009).

Engaging All Levels of Society

Communicating climate action is not just important in relation to media messages but also in how individuals can be engaged to make small daily changes. Campaigns like the *Power of One* can be effective in reaching a wide audience, and the SEAI have developed tailored information packages for particular groups, from the private sector to individuals. For example, individuals want to know 'what can I do?' Information such as that provided by SEAI is valuable in this regard:

> Thinking and acting in an energy-efficient way in the home can reduce domestic energy consumption by 15 per cent or more. You can achieve this by changing your behaviour and applying simple tips on how you use energy in the home *(e.g. turning thermostat down, closing curtains, turning off lights and appliances);* considering energy efficiency when you make energy-consuming purchases. In other words, by buying energy-efficient products and by using energy efficiently.[47]

In the UK, sustainable behaviour has been communicated in terms of key changes that people should make. Table 7.1 presents some headline measures.

Box 7.1 UK Headline Measures of Sustainable Behaviour

Personal transport:
Use more efficient vehicles
Use car less for short trips
Avoid unnecessary flights (short haul)
Homes: energy
Install insulation
Better energy management
Install microgeneration
Homes: waste
Increase recycling
Waste less food
Homes: water
More responsible water usage
Eco-products:
Buy energy-efficient products
Eat more food locally in season
Adopt lower impact diet

Source: Adapted from (The Department of the Environment Food and Rural Affairs, 2005)

[47] http://www.seai.ie/Publications/Your_Home_Publications_/Energy_Efficiency/Householders_be_your_own_energy_manager_guide.pdf

While this has the merits of clarity and brevity, assessing their impact or changes in terms of single behaviour changes does not fully capture the complexities of changing social practices. Behaviour change is often in the context of inter-related behaviours and practices. It becomes difficult also to evaluate any changes from such headline measures as there would be little gleaned on:

- What motivated or caused a particular change in behaviour;
- Whether that behavioural change is long lasting, and how likely it is to change again if circumstances change;
- How different behaviours may support or work against each other; and
- The overall contribution or impact to sustainability of a particular behaviour, or set of behaviours (Rogerson *et al.*, 2009).

As well as focusing on specific behaviours, there is value in adopting a broader approach to improving capacity for carbon accounting, awareness and efficiency. A useful concept here is carbon capability.

Carbon Capability

One of the strongest ways to respond to uncertainty in relation to climate change is to develop and enhance the capacity to measure, monitor and improve our carbon 'footprint'. Carbon capability refers to the necessary understanding and capabilities for domestic actors to have a more active role in a transition to a lower carbon energy system (or economy) (Whitmarsh, 2009), (Nye *et al.*, 2010: 711). It includes the situated meanings of carbon and energy in everyday life and individuals' abilities and motivations to reduce emissions. The construct of 'carbon capability' delineates the skills, situated knowledge, motivation, and capacity to cut carbon.

Whitmarsh *et al.* from the UK's Tyndall Centre for Climate Change Research, outline the potential of carbon capability. It includes a critical understanding of:

- The causes and consequences of carbon emissions;
- The role individuals—and particular activities—play in producing carbon emissions;
- The scope for (and benefits of) adopting a low-carbon lifestyle;
- What is possible through individual action;
- Which carbon-reduction activities require collective action and infrastructural change;
- Managing a carbon budget;

- Information sources—and their reliability (in terms of bias, agenda, uncertainty, etc.)—for achieving a carbon capable lifestyle; and
- The broader structural limits to and opportunities for sustainable consumption (Whitmarsh *et al.*, 2011); (Whitmarsh, 2009).

They conclude that individuals would benefit from education to promote understanding and skills to manage their carbon emissions, as well as structural measures to enable and encourage carbon capability.

For an increasing number of companies, addressing climate change has become part of the corporate strategy (OECD, 2010). Climate change is confronting companies and organisations with new risks and challenges. Box 7.2 presents some examples of carbon accounting and capability in practice in Ireland, with a mixture of private, public and community organisations.

Box 7.2 Carbon Capability in Practice

Origin Green: Launched by Bord Bia in 2012 manufacturers set targets in areas such as energy, waste, water, biodiversity and corporate social responsibility activities. The aim is to both reduce carbon footprint and costs. By the end of 2014, it is expected that 75 per cent of Irish food and drink exports will be sourced from companies signed up to Origin Green. The companies voluntarily sign up to an almost quasi regulatory relationship in which Bord Bia is monitoring a wide array of environmental standards. This is innovative and it will provide a new way of underpinning the competitiveness of Irish food.

Green Hospitality Programme: The Green Hospitality Programme is an Irish developed environmental certification standard for the hospitality sector. It is a voluntary programme that aims to develop leadership and best practice within the hospitality sector.

Kilbarrack Fire Station staff with support from Dublin City Council developed a 'green plan' which has lowered the stations carbon footprint. Harvested rainwater is now used in fire engines. Biodiesel made from cooking oil collected from fish and chip shops across Dublin is being used to reduce fire engine running costs by €150,000 per year. The initiative achieved a 90 per cent reduction in water consumption and more than 80 per cent reduction in energy consumption. A key feature of the plan is that savings have been ring-fenced by DCC and are being used to fund investments in Kilbarrack and other fire stations. Careful monitoring of energy use, with outside verification by SEAI, provide an evidence base for further retrofitting in other stations (Price, 2013).

Transition Town Kinsale: This is a voluntary community initiative working to help make the transition from a dependency on fossil fuel to a low-carbon future. Their vision is a resilient, self-reliant and sustainable Town. Kinsale Town Council adopted their Energy Descent Action Plan in 2006.

Sustainable Energy Communities: Current work by the SEAI and through the EU-funded Leadership for Energy Action and Planning (LEAP) project and the SEAI supported Sustainable Energy Community (SEC) Programme. This will work with a number of local authorities to act as mentors in the promotion of sustainable energy measures in the local economy. Three exemplar Sustainable Energy Communities have been designated as 'living laboratories' in 2012 (with a further three to be launched by 2015) which will carry out locally focused projects to increase energy efficiency and reduce energy costs.

Camphill-Ballytobin, houses 85 people on an eight hectare site which includes a primary school, workshops and a community hall. Since 1999, it has used biogas to supply heat to houses and other buildings on the site. It also collects waste from local farmers and delivers treated soil back to farmers.

Sustainable Energy Communities is SEAI-led work in which local authorities are supported to become mentors in the promotion of sustainable energy measures in the local economy. Three exemplar communities have been designated as 'living laboratories' in 2012 (with a further three to be launched by 2015). They carry out locally focused projects to increase energy efficiency and reduce energy costs.

Dublin City Council have a Climate-Change Strategy, Dublin City Sustainable Energy Action Plan are signed up to the EuroCities Declaration on Climate Change. They have identified good practice across areas including energy, waste, economy, water, biodiversity and parks, society, transport, procurement. It carriers out an indicator report to benchmark Dublin internationally.

The National Waste Prevention Programme, led by the EPA, works to deliver substantive waste prevention and minimisation and integrate a range of initiatives addressing awareness-raising, technical and financial assistance, training and incentive mechanisms. It is supported by the National Waste Prevention Committee, a broad stakeholder group. Some of the networks it has funded include the Local Authority Prevention Network which aims to develop capacity in prevention in all local authorities to assist commercial and community initiatives; the Green Business Initiative which provides tools and methodologies to help organisations to make financial savings by looking at their resource use, and also to help the environment and a pilot initiative called Green Home to build on the success of Green Schools and spread waste prevention to houses and communities.[48]

Codema is one of 14 Local Energy agencies operating in Ireland. It works with public and private sectors to create sustainable solutions for Dublin, including residential, business and infrastructural projects, such as Ballymun Regeneration, Green e-Motion and Dublin District Heating.

GAA is working at a national level to develop processes and methods to help communities carry out sustainable energy projects. The work will focus on barriers to investment that exist in specific communities, including finance, organisation and project management, and attitudes and behaviours.

Large Industry Energy Network (LIEN) is a voluntary grouping, facilitated by the Sustainable Energy Authority (SEAI), of companies that work together to develop and maintain robust energy management. 140 of Ireland's largest energy users are members.

Carbon Disclosure Project: This is an independent not-for-profit organisation which supports Irish and international companies to disclose and drive down their greenhouse gas emissions and use of natural resources. Since its inception in 2000, CDP has built the world's largest database of corporate climate-change information, in the process helping stimulate changes to corporate and national attitudes and policies.

Celtic Linen: The company are using carbon accounting and a KPI system to focus attention on reducing their carbon footprint. A comparative trial on the performance of EVs and gas trucks against diesel equivalent is underway. In return for covering some of the administrative costs of running a trial on competing forms of transport they are offering the data to the public sector body so that it could be used to help inform policy.

Bewley's Coffee aims is to be carbon-neutral and is achieving this based on an ongoing programme of energy and resource efficiency within its production facility and by working closely with agricultural suppliers, located in developing countries, to improve their farming and production practices.

[48] http://www.epa.ie/whatwedo/resource/nwpp/

Business in the Community (BITC): BITC is a national non-profit organisation working with its corporate members to be more responsible and sustainable including running specific community-based projects. The Business Working Responsibly Mark is certification awarded to organisations with responsible and sustainable practices.

The UK's **Carbon Trust** is working with retailers to find new ways to communicate their carbon accounting. Some business leaders finding new profits through reducing energy costs and improving the carbon efficiency of their products.

Glanbia Ingredients Ireland has created a sophisticated process by which it assists farmers to farm more efficiently and reduce emissions. The project was supported by Bord Bia and the methodology and calculations were accredited by the Carbon Trust in the UK.

Climate Justice

As the ESRC in the UK argue, climate change presents real social opportunities as well as business and commercial ones (ESRC, 2010:4). There are distributional dimensions and impacts including fuel poverty. Vulnerable groups, those in poverty, with poor social networks, or in substandard housing are likely to face the brunt of climate-change mitigation. A 2009 review by CAG Consultants concludes that in the UK the people most likely to be vulnerable to climate change are those that 'are already deprived by their health, the quality of their homes and mobility; as well as people who lack awareness of climate change, the capacity to adapt and who are less well supported by families, friends and agencies' (CAG Consultants, 2009:44) Climate justice is a broad focus on the ethical and distributional impacts of climate change, with a focus on social justice, human rights and equality. 'It links human rights and development to achieve a human-centred approach, safeguarding the rights of the most vulnerable and sharing the burdens and benefits of climate change and its resolution equitably and fairly'(Mary Robinson Foundation-Climate Justice, 2011:3).

Community Resilience

Another concept which is increasingly being used in relation to climate action is resilience. This term has many definitions but mostly refers to flexibility, diversity, adaptive learning as key responses to managing risk and real-world dynamics (Shaw, 2013, Leach, 2008). In particular, community resilience provides a useful concept for bottom-up involvement and what communities can do for themselves, with appropriate supports. It is often used in relation to adaptation to climate change and it is likely it will increasingly become key as Ireland has to cope with the impacts of climate change such as flooding.

One example of resilience in communities is in the Transition Town movement in the UK. The emergence of Transition Towns forms part of an upsurge in interest in grassroots innovation in practitioner, academic and policy circles (The Department of the Environment Food and Rural Affairs, 2005). Grassroots innovations involve a group of socially motivated volunteers adapting tools like the Transition Towns

Handbook, the EcoTeams programme (see Global Action Plan 2010), or LETS, to their specific local needs, or inventing new ways of engaging with each other and their local communities. In doing so they create variants of an innovative type of organisation: a voluntary association of citizens who act together in creative ways on climate-change issues (Bergman *et al.*, 2010). Kinsale's Town Council supported the Kinsale as Ireland's first Transition Town by adopting the Kinsale Energy Descent Plan in 2005.

In this way, social innovation and not just technological innovation is recognised as central to developing low carbon solutions and practices. Bergman et al argue that in the UK, bottom-up, low-carbon, social innovations are happening in society at large which are attempting to address climate change issues (Bergman *et al.*, 2010). These include examples such as Transition Towns now called Transition Network and workplaces where employees are taking the lead to drive down energy use. SEAI reported in 2011 from a survey of 1,000 large, medium and small businesses across the country that over 45% of medium and large companies now have a dedicated employee or group of employees managing energy consumption and running initiatives in businesses to increase energy efficiency.[49]

Key Role of Education

Education has a major role to play in the transition to a low-carbon future. It is key to influencing attitudes and behaviour as well as developing the skills, knowledge and understanding to help us make the most of the opportunities provided by a low-carbon economy (The Scottish Government, 2010: 18).

The transition towards green economies and societies requires that we educate and train everyone and prepare society at large for such a sustainable future (UNESCO, 2012). Education for Sustainable Development (ESD) is a banner theme for many types of education that focus on aspects of sustainability from climate change to disaster risk reduction or biodiversity and is the term used by the United Nations in their programmes.[50]

For Tilbury and Wortman, the following skills are essential to ESD:

- Envisioning—being able to imagine a better future. The premise is that if we know where we want to go, we will be better able to work out how to get there.

[49] http://www.seai.ie/News_Events/Press_Releases/2011/chambers_release.html

[50] http://www.unesco.org/new/en/education/themes/leading-the-international-agenda/education-for-sustainable-development/education-for-sustainable-development/

- Critical thinking and reflection—learning to question our current belief systems and to recognise the assumptions underlying our knowledge, perspective and opinions. Critical thinking skills help people learn to examine economic, environmental, social and cultural structures in the context of sustainable development.
- Systemic thinking—acknowledging complexities and looking for links and synergies when trying to find solutions to problems.
- Building partnerships—promoting dialogue and negotiation, learning to work together.
- Participation in decision-making—empowering people (Tilbury & Wortman, 2004).

One successful example of environmental education, key to increase societal awareness is the Green Schools Programme (Box 7.3).

Box 7.3 Green Schools

Green-Schools, known internationally as Eco-Schools, is an international environmental education programme, environmental management system and award scheme that promotes and acknowledges long-term, whole school action for the environment. It is co-ordinated on an international level by FEE (Foundation for Environmental Education) and run in Ireland by An Taisce.

The programme, running here for 15 years, has resulted in savings of nearly €9m in waste, electricity, and water costs over the school years 2010–2012. Over 2500 schools have been awarded the Green flag which they get usually after 2 years of efforts to reduce litter and waste. The programme is run on 7 themes, so that after waste, schools spend a further 2 years on energy, water, travel and biodiversity. Schools apply to the programme and have to conduct an environmental review to outline their current practices, and then once accepted into the programme, follow an action plan to target different areas. It is an internationally recognised accreditation system but schools themselves come up with ways to improve efficiencies. The programme provides best practice information and guidance on its website and local authorities are involved at a local level. Schools monitor and evaluate their progress so learn to audit their practices.

It is interesting for four reasons. Firstly, because it is running in most Irish schools and therefore has a strong educational and awareness raising role in families. Secondly, because it is reducing emissions through energy savings (e.g. through reduced electricity and in changing travel behaviour) and other aspects of good sustainability practice. Thirdly, because of the *way* it does this, through bottom up innovation, evaluation and supports. Finally, the schools use resources more effectively, therefore provide tangible cost-savings.

Source: An Taisce/ Green Schools Website[51]

Alongside this initiative, there is a statutory requirement for public sector organisations to reduce energy consumption by 33 per cent by 2020. Public bodies, including schools, are asked to monitor and report energy use to SEAI from 2011 (Department of Communications, 2009). A dedicated website offers advice to

[51] http://www.greenschoolsireland.org/

schools on how to save energy, run by the SEAI and the Department of the Environment and Skills.[52]

7.3 Conclusion

Achieving societal engagement will be critical in the transition to a carbon-neutral society. This chapter has outlined some key issues to be considered as part of that engagement, with no single best method emerging. What seems to emerge as of most importance is realising the potential value of more effective communication on climate issues, both in terms of increased support for policy measures, but also in the longer term development of Irish carbon capability. Our school children are learning how to reduce waste, save energy and keep heat in as normal practices in Green Schools, and this could become common practice for all in the coming years, with the right supports.

[52] http://www.energyineducation.ie/Energy_In_Education/

Chapter 8: Overall Conclusion

8.1 The Social Challenge

A focus on behaviour change is likely to play a central role in the transition to carbon-neutral society. As we outlined in our Final Report, such a transition will require discovery and dissemination of profound behavioural change in enterprises, public sector organisations, communities and households. This Background Paper presents the tip of a large iceberg of social and behavioural research as a valuable resource in this area.

Behaviour change is undoubtedly hard to achieve, but it is possible. Behaviours are, however, constantly changing, often prompted by new technologies such as the mobile phone. Explaining why and how they change is complex, but no longer without some explanation and insights. Why the plastic bag levy was effective here, for example, is only partially explained by the financial disincentive, as there was large support in efforts to reduce waste and a willingness by many to change their social practice of shopping to include bringing a bag along. It was successful because it built a willingness to change practices and there were alternatives available, e.g. alternative bags and a desire to reduce waste. It is this layering of motivation, structural support, incentives and behaviour change opportunities that are likely to be most successful. As outline in Chapter 1, behaviour change is not a one-by-one persuasion task, but a social challenge (Vanclay, 2004: 17) which includes institutional and landscape change, as well as more individually-focused efforts.

The paper has shown that with an emphasis on placing particular behaviours within their social, cultural and technological contexts, there is a shift away from a purely economic model of consumer choice, to one which recognises that long-lasting behaviour change needs to occur across all levels, involving institutional, technological change as well as a shift in social practices and norms. It also shows that the social practice approach could be a useful framing device in this regard, particularly in relation directing further research into sustainable practices in mobility, home heating and farming, for example. The key message of this paper is that a widening and deepening is required in understanding behaviour change- widening in the sense of moving beyond the individual to shared practices, habits and routines- and deepening, in that it is necessary to get under the skin of attitudes, to deeper motivations and values, for long-lasting change. While information on climate change and effective options for energy reduction, for example, is important,

conveying that alone will not be sufficient for the scale and range of change needed among Irish people in how they live, work and travel.

8.2 Future Directions

Within the Irish context, it is of value to consider how best to utilise current thinking in this area. While the evidence presented here can be drawn on for specific areas of focus, such as energy efficiency, a more co-ordinated and strategic approach to social and behavioural research could be developed. Research and practice from social scientists can play a critical role across all levels of climate policy from the design, implementation and evaluation of measures to the wider communication of climate policies. However, policy measures drawing from social and behavioural research need to be communicated effectively, and that once tried, they need to be evaluated, and learning shared across sectors. For example in England, the use of random control trials by the Behavioural Insights Team provides evidence of what works across a number of policy sectors include energy use (Halpern, 2012). While such trials are costly, other evaluation approaches could also be used which maximise the learning from one sector or policy measure to another.

Taking social and behavioural aspects seriously will help to support greater community engagement, more effective policy making, targeted measures and practices. It would be valuable to build an Irish skill-base and set of perspectives on the social and behavioural aspects of climate change and low-carbon living.

Finally, it is evident that further work is needed to distil key insights for particular sectors and then apply them in home-grown research on Irish measures and practices. While there is no magical solution to changing behaviour, and no single best approach, there are valuable insights to be gained from a closer look at this body of work, and strategies which can result in cost and energy savings both now and in the longer term.

Bibliography

American Psychological Association (2011), *Psychology and Global Climate Change: Addressing a Mulitfaceted Phenomenon and Set of Challenges*, 2011, Washington: American Psychological Association.

Anable, J., Lane, B. & Kelay, T. (2006), *An Evidence Base Review of Public Attitudes to Climate Change and Transport Behaviour*, UK: The Department for Transport.

Arapostathis, S., Carlsson-Hyslop, A., Pearson, P., Thornton, J., Gradillas, M., Laczay, S. & Wallis, S. (2012), 'Governance and Branching Points in Sociotechnical Transitions: Cases and insights from the manufactured gas regime', Presentation to the University of Bath, "Transition Pathways Final Dissemination Conference", London, 18th April 2012.

Avineri, E. & Goodwin, P. (2010), *Individual Behaviour Change: Evidence in Transport and Public Health*, London: The Department for Transport. http://eprints.uwe.ac.uk/11211/2/avineri-goodwin_DfT_Individual_behaviour_change.pdf.

Barnes, A.P. & Toma, L. (2012), 'A Typology of Dairy Farmer Perceptions Towards Climate Change', *Climatic Change,* 112(2): 507-522.

Barry, J. & Ellis, G. (2010), 'Beyond Consensus? Agonism, Contestation, Republicanism and a Low Carbon Future' in Devine-Wright, P. (Ed.) *Renewable Energy and the Public,* London: Earthscan.

Behavioural Insights Team (2011), *Behaviour Change in Energy Use,* London: Cabinet Office.

Behavioural Insights Team (2012), *Annual Update 2011-12*, HMSO, London: Cabinet Office. http://www.cabinetoffice.gov.uk/sites/default/files/resources/Behavioural-Insights-Team-Annual-Update-2011-12_0.pdf.

Bell, S. & Hindmoor, A. (2009), *Rethinking Governance: The Centrality of the State in Modern Society,* Cambridge: Cambridge University Press.

Bergman, N., Markusson, N., Connor, P. , Middlemiss, L. & Ricci, M. (2010), 'Bottom-up, Social Innovation for Addressing Climate Change', Presentation to the University of Sussex, "Social Innovation for Addressing Climate Change: Sussex Energy Group Conference ", Brighton, Sussex, 25th-26th February 2010.

Berkes, F. (2007), 'Understanding Uncertainty and Reducing Vulnerability: Lessons from Resilience Thinking', *Natural Hazards,* 41(2): 283-295.

Blake, J. (1999), 'Overcoming the "Value-action Gap" in Environmental Policy: Tensions between National Policy and Local Experience', *Local Environment: The International Journal of Justice and Sustainability,* 4(3): 257-278.

Breukers, S, Heiskanen, E, Mourik, R M, Bauknecht, D, Hodson, M, Barabanova, Y, Brohmann, B, Burger, V, Feenstra, C F J , Jalas, M, Johnson, M, Maier, P, Marvin, S, Meinel, H, Pariag, J, Rask, M, Rinne, S, Robinson, S, Saastamoinen, M, Salminen, J, Valuntiene, I & Vadovics, E (2009), *Deliverable 5: Interacton*

Schemes for Successful Energy Demand Side Management. Building blocks for a practicable and conceptual framework, Seventh Framework Programme, Changing Behaviour.

Browne, D., Caulfield, B. & O'Mahony, M. (2011), *Barriers to Sustainable Transport in Ireland - Assessing the Barriers to Sustainable Transport in Ireland*, Dublin: Environmental Proection Agency.

Busse, M.R., Knittel, C.R. & Zettelmeyer, F. (2012), *Are Consumers Myopic? Evidence from New and Used Car Purchases*, Boston: Massachusetts Institute of Technology

CAG Consultants (2009), *The Differential Social Impacts of Climate Change in the UK*, Research, SNIFFER Scotland and Northern Ireland Forum for Environmental, London: CAG Consultants.

Casey, J.W. & Holden, N. (2006), 'Quantification of GHG Emissions from Suckler-Beef Production in Ireland', *Agricultural Systems,* 90: 79-98.

CCMA (2008), *Local Authority Climate Change and Energy Efficiency Measures:Best Practice and Current Initiatives*, Dublin: County and City Managers' Association,.

Centre for Research on Environmental Decisions (2012), *The Psychology of Climate Change Communication*, New York: CRED, Columbia University.

Comhar (2007), *Communicating Climate Change and the Reduction of Greenhouse Gas Emissions. Submission to the Department of Environment, Community & Local Government*, Dublin: Comhar.

Comhar (2011), *Community Renewable Energy in Ireland: Status, Barriers and Potential Options. Policy Paper*, November 2011, Dublin: Comhar.

Committee on Climate Change (2012), *How Local Authorities Can Reduce Emissions and Manage Climate Risk*, London: Committee on Climate Change.

Corfee-Morlot, J., Lamia Kamal-Chaoui, M.G., Donovan, I., Alexis, R. & Teasdale, P.J. (2009), *Cities, Climate Change and Multilevel Governance*, Environmental Working Papers N° 14, Paris: OECD

Cotter, E. (2012), *Ireland's Greenhouse Gas Emissions in 2011*. http://www.epa.ie/news/pr/2012/name,33923,en.html, 19/11/12.

Cox, A., Higgins, T., Gloster, R. & Foley, B. (2012), *The Impact of Workplace Initiatives on Low Carbon Behaviours,* Edinburgh: Scottish Government Social Research.

Davies, A. (2009), *Civil Society and the Politics of Waste Management in Ireland: Constraint, Concern and Conflict*. http://www.istr.org/resource/resmgr/working_papers_bangkok/davies.anna.pdf, 25/5/12.

De Serres, A., Llewellyn, J. & Llewellyn, P. (2011), *The Political Economy of Climate Change Mitigation Policies: How to Build a Constituency to Address Global Warming?*, Working Paper No.887, Economics Department, Paris: Organisation for Economic Co-operation and Development (OECD).

Department for Transport (2011), *Behavioural Insights Toolkit*, London: Social Research and Evaluation Division, Department of Transport (UK).

Department of Agriculture, Food and the Marine (2012), *Response to NESC Request/Information on: Greenhouse Gas Mitigation Options in the Agriculture Sector and Role of Forestry in the National Greenhouse Gas Mitigation Agenda*, Dublin: Department of Agriculture, Food and the Marine.

Department of Communications, Energy and Natural Resources (2009), *Maximising Ireland's Energy Efficiency: The National Energy Efficiency Action Plan 2009-2020*, Dublin: Department of Communications, Energy and Natural Resources,.

Department of Communications, Energy and Natural Resources (2012), *Government Policy Statement on the Strategic Importance of Transmission and Other Energy Infrastructure*, Dublin: DCENR.

Department of Communications Energy and Natural Resources (2008), *Power of One Campaign Progress Report No. 3* 1 July 2007-30 April 2008, Dublin: Department of Communications, Energy and Natural Resources.

Department of Environment, Community and Local Government (2012), *Putting People First, the Action Programme for Effective Local Government*, Dublin: Department of Environment, Community and Local Government.

Department of the Environment, Community and Local Government (2012), *Draft Framework for Sustainable Development in Ireland*, Dublin Department of Environment, Community and Local Government.

Department of Transport, Tourism and Sport (2009), *Smarter Travel: A Sustainable Transport Future: A New Transport Policy for Ireland 2009-2020*, Dublin Department of Transport, Tourism and Sport.

Devine-Wright, P. (2011), 'Public Engagement with Large-scale Renewable Energy Technologies: Breaking the Cycle of NIMBYism', *Climate Change,* Volume 2(January/February): 19-26.

Downing, P. & Ballantyne, J. (2007), *Tipping Point or Turning Point? Social Marketing & Climate Change*, London: Ipsos MORI Social Research Institute.

Doyle, R. & Davies, A. (2012), *Transition Framework: Towards Future Practices of Sustainable Heating*, Environmental Protection Agency, Trinity College Dublin & National University of Ireland Galway, Dublin: Consensus Project.

Duffy, P., Hyde, B., Hanley, E., Dore, C., O'Brien, P., Cotter, E. & Black, K. (2011), *Ireland National Inventory Report 2011*, Greenhouse Gas Emissions 1990-2009 Reported to the United Nations Framework Convention on Climate Change, Wexford: Environmental Protection Agency.

Element Energy (2009), *Strategies for the Uptake of Electric Vehicles and Associated Infrastructure Implications for The Committee on Climate Change Final Report* Cambridge: Element Energy. http://downloads.theccc.org.uk/Element_Energy_-_EV_infrastructure_report_for_CCC_2009_final.pdf.

Ellis, G. (2011), 'Public Reaction to Wind Projects: Insights from the Social Sciences', Presentation to the SEAI "Wind Energy 2011:Planning, People and the Environment ", Dublin, 22nd September 2011.

Ellis, G. (2012), *A Review of the Context for Enhancing Community Acceptance of Wind Energy in Ireland*, Ireland, Sustainable Energy Authority, Dublin: SEAI.

Ellis, G., Cowell, R., Warren, C., Strachan, P. & Szarka, J. (2009), 'Wind Power: Is there a 'Planning Problem'? and Expanding Wind Power: A Problem of Planning or of Perception?', *Journal of Planning Theory and Practice,* 10(4): 521-547.

ESRC (2010), *How Will Climate Change Affect People in the UK and How Can We Best Develop and Equitable Response? ESRC Seminar Series Mapping the Public Policy Landscape*, Swindon: Economic Social Research Council.

European Commission (2011a), *Climate Change: Special Eurobarometer 372,* Brussels: European Commission.

European Commission (2011b), *Climate Change: Special Eurobarometer 372*, TNS Opinion & Social, Brussels: European Commission.

Evans, J.P. (2012), *Environmental Governance,* Abingdon, Oxon: Routledge.

Ewing, M. (2011), 'An Environmental Perspective. Participatory Democracy -The Story of a Trojan Horse', Presentation to the Social Justice Ireland, "Sharing Responsibility in Shaping the Future", Dublin.

Faber, J., Schroten, A., Bles, M., Sevenster, M., Markowska, A., Smit, M., Rohde, C., Dütschke, E., Köhler, J., Gigli, M., Zimmermann, K., Soboh, R. & van ’t Riet, J. (2012), *Behavioural Climate Change Mitigation Options and Their Appropriate Inclusion in Quantitative Longer Term Policy Scenarios*, European Commission, DG Climate Action, Delft: CE Delft.

Farrell, M., McDonagh, J. & Mahon, M. (2008), *Agricultural Extension Advisory Services: The Challenge of Implementing a Multifunctional Advisory Programme*, The Rural Economy Research Centre Working Paper Series, Wexford: Teagasc.

Finn, C. (2012), *Modelling the Long Run Transition to a Low-Carbon Economy: The Contribution of Models and Roadmaps: Background Paper No.4*, Dublin: National Economic and Social Council.

Forfás (2010), *Adaptation to Climate Change: Issues for Business* Dublin: Forfas.

Foxon, T. & Pearson, P. (2011), 'Transition pathways for a UK low carbon electricity system: exploring roles of actors, governance and branching points

Working Paper for ', Presentation to the University of Lund, "2nd International Conference on Sustainability Transitions: “Diversity, Plurality and Change: Breaking New Grounds in Sustainability

Transitions Research”", University of Lund, Lund, Sweden, 13-15 June 2011.

Frantzeskaki, N., Koppenjan, J. , Loorbach, D. & Ryan, N.F. (2012), 'Concluding Editorial: Sustainability Transitions and their Governance: Lessons and Next Step Challenges', *International Journal of Sustainable Development,* 15(1/2): 173-186.

Gaede, J. (2010), *Pathways to a Low Carbon Society: A Comparison of Low-carbon Transition Scenarios*, Working paper series Ottawa, Ont.: Policy Research Initiative.

Gardner, G. T. & Stern, P. C. Boston, M.A. (2002), *Environmental Problems and Human Behavior, 2nd,* Boston: Pearson Custom Publishing.

Gargan, E. (2012), 'Reflections on the Implementation of the Carbon Tax for Ireland', Presentation to the NESC and the UCD Urban Institute, "UCD / NESC Workshop: Climate Change Meeting Ireland's 2020 Obligations ", UCD, 16th May 2012. www.nesc.ie.

Gatersleben, B. (2007), 'Affective and Symbolic Aspects of Car Use: A Review.' in Gärling, T. & Steg, L. (Eds.), *Threats to the Quality of Urban Life from Car Traffic: Problems, Causes, and Solutions,* Amsterdam: Elsevier 219-234.

Geels, F. (2002), 'Technological Transitions as Evolutionary Reconfiguration Processes: A Multi-level Perspective and a Case-study', *Research Policy,* 31: 1257-1274.

Geels, F. (2005), *Technological Transitions and System innovations: A Co-evolutionary and Socio-Technical Analysis,* Cheltenham: Edward Elga.

Green Alliance (2012), *Neither Sermons Nor Silence: The Case for National Communications on Energy Use*, London: Green Alliance.

Haggett, C. (2011), 'Planning and Persuasion: Public Engagement in Renewable Energy Decision-Making' in Devine-Wright, P. (Ed.) *Renewable Energy and the Public: From NIMBY to Participation,* London: Earthscan. 15-28.

Haggett, C. (2012), 'The Social Experience of Noise from Wind Farms' in Szarka, J., Cowell, R., Ellis, G., Strachan, P. & Warren, C. (Eds.), *Learning from Wind Power: Governance, Societal and Policy Perspectives on Sustainable Energy,* London: Palgrave MacMillan. 153-173.

Haines, A. & Dora, C. (2012), 'How the Low Carbon Economy Can Improve Health', *British Medical Journal,* 344.

Hall, A. & Dorai, K. (2010), *The Greening of Agricultural Innovation and Sustainable Growth,* OECD, Brighton: Link Limited.

Halpern, D. (2012), 'Applying Behavioural Insights to Public Policy ', Presentation to the ESRI, "Applying Behavioural Economics to Public Policy", ESRI, Dublin, 30/11/12.

Hausman, J. A. (1979), 'Individual Discount Rates and the Purchase and Utilization of Energy-Using Durables', *The Bell Journal of Economics,* 10(1): 33-54.

Heiskanen, E., Johnson, M., Robinson, S., Vadovics, E. & Saastamoinen, M. (2010), 'Low-carbon Communities as a Context for Individual Behavioural Change', *Energy Policy,* 38: 7586-95.

Hoed, R.V, Harmelink, M. & Joosen, S. (2006), *Evaluation of the Dutch Ecodrive Programme: In Frame of Aid-ee Project*, Lund University. http://www.aid-ee.org/documents/000015Ecodriving-Netherlands.pdf, 30/5/12.

Holden, N. (2012), *Some Observations on Livestock Production and the Abatement of Agricultural GHG Emissions in Ireland*, Submission to NESC, Dublin: University College Dublin.

Hoogma, R., Kemp, R. , Schot, J. & Truffer, B. (2002), *Experimenting for Sustainable Transport: The Approach of Strategic Niche Management* London: London.

Huber, S., Hobarty, R. & Ellis, G. (2012), 'Social Acceptance of Wind Power Projects: Learning from Trans-National Experience' in Szarka, J., Cowell, R., Ellis, G., Strachan, P. & Warren, C. (Eds.), *Learning from Wind Power: Governance, Societal and Policy Perspectives on Sustainable Energy,* London: Palgrave MacMillan. 215-234.

ICMSA (2011), *Capital and Credit Requirements for the Development of the Irish Dairy Sector*, Streamlining the Lending Process, April 7, Dublin: Irish Creamery Milk Suppliers' Association.

IEA (2011), *Energy Efficiency Policy and Carbon Pricing*, Agency, International Energy, Paris: IEA/OECD.

Information Society Commission (2005), *Learning to Innovate - Repercieving the Global Information Society*, Taoiseach, Department of the, Dublin: Information Society Commission.

Institute for Public Health (2010), *Climate Change and Health: A platform for Action*, Institute for Public Health. http://www.publichealth.ie/sites/default/files/documents/files/Climate_change_and_health_0.pdf, 30/5/12.

Irish Wind Energy Association (2012), *Best Practice Guidelines for the Irish Wind Energy Industry*, IWEA, Naas, Kildare: Fehily Timoney & Company, Core House, Pouladuff Road, Cork.

Jackson, T. (2005), *Motivating Sustainable Consumption: A Review of Evidence on Consumer Behaviour and Behavioural change*, Guildford: Centre for Environmental Strategy, University of Surrey.

Jolly, R. (2011), *Technological Innovation in Dairy Nutrition: Improving Economic, Envirnmental and Animal Helath Performance with an Integrated Production System*, February 7, Ames Iowa: Iowa State University.

Kavanagh, R., F., Waldron., Ruane, B. & Oberman, R. (2012), 'Education, Climate Change and Climate Justice Irish Perspectives', Presentation to the AERA, "AERA (American Educational Research Association) Conference", Vancouver, Canada., 17 April, 2012.

Kemp, R. (2005), *Transition Management: A Model for Sustainable Development* kemp.unu-merit.nl/.../Transition%20management%20for%20SD3.doc, 02/01/13.

Kollmuss, A. & Agyeman, J. (2002), 'Mind the Gap: Why do People Act Environmentally and What are the Barriers to Pro-environmental Behavior?', *Environmental Education Research,* 8(3): 239-260.

Koppenjan, J., Frantzeskaki, N., Loorbach, D., Charles, M.B. & Ryan, N. (2012), 'Introductory Editorial', *International Journal of Sustainable Development,* 15(1/2): 1-18.

Kuhn, T.S. (1962), *The Structure of Scientific Revolutions,* Chicago: University of Chicago Press.

Laitner, J. A., Ehrhardt-Martinez, K. & McKinney, V. (2009), 'Examining the Scale of the Behaviour Energy Efficiency Continuum', Presentation to the ECEEE,

"ECEEE 2009 Summer Study; Act! Innovate! Deliver! Reducing Energy Demand Sustainably", Côte d'Azur, France, 1-6 June.

Lavelle, M. & Fahy, H. (2012), *ConsEnSus Lifestyle Survey - Fact Sheet No. 9 - Summary and Conclusions*, TCD, NUI Galway, EPA, Dublin: ConsEnSus.

Lavelle, M., Carroll, B. & Fahy, F. (2012a), *ConsEnSus Lifestyle Survey - Fact Sheet No. 4 - Food Consumption*, TCD, NUI Galway, EPA, Dublin: ConsEnSus.

Lavelle, M., Davies, A., Fahy, F. & Doyle, R. (2012b), *ConsEnSus Lifestyle Survey - Fact Sheet No. 7 - Energy Consumption*, TCD, NUI Galway, EPA, Dublin: ConsEnSus.

Lavelle, M., Rau, J., Heisserer, B. & Hynes, M. (2012c), *ConsEnSus Lifestyle Survey - Fact Sheet No. 3 - Transport*, TCD, NUI Galway, EPA, Dublin: ConsEnSus.

Leach, M. (2008), 'Reframing Resilience: Transdisciplinarity, Reflexivity and Progressive Sustainability', Presentation to the STEPS Centre, "Reframing reslience - STEPS Centre symposium 2008", Brighton.

Loorbach, D. (2004), 'Governance and transitions: a multi-level policy-framework based on complex systems thinking. ', Presentation to the Environmental Policy Research Centre (FFU), Freie Universität Berlin, "Conference on Human Dimensions of Global Environmental Change", Berlin.

Lorenzoni, I., Nicholson-Cole, S. & Whitmarsh, L. (2007), 'Barriers Perceived to Engaging with Climate Change Among the UK Public and their Policy Implications', *Global Environmental Change,* 17(3–4): 445-459.

Macken-Walsh, A. (2009), *Barriers to Change: A Sociological Study of Rural Development in Ireland*, Teagasc, Galway: National University of Ireland, Galway.

Mary Robinson Foundation-Climate Justice (2011), *MRFCJ Business Plan 2011-2014*, Dublin Mary Robinson Foundation-Climate Justice.

McGloughlin, J. S. & Sweeney, J. (2011), 'Multi-level Climate Policies in Ireland', *Irish Geography,* 44(1): 137-50.

McKenzie-Mohr, D. (2000), 'Promoting Sustainable Behavior: An Introduction to Community-Based Social Marketing', *Journal of Social Issues,* 56(3): 543-554.

Meadowcroft, J (2009), 'What about the Politics? Sustainable Development, Transition Management, and Long Term Energy Transitions', *Policy Science,* 42: 323-40.

Meuleman, L. (2010), 'Governance and the Usability of Knowledge for Policymakers.' in In 't Veld & Roeland, J. (Eds.), *Knowledge Democracy. Consequences for Science, Politics, and Media,* Heidelberg: Springer. 214-224.

Moloney, S., Horne, R. & Fien, J. (2010), 'Transitioning to Low Carbon Communities: From Behaviour Change to Systemic Change: Lessons from Australia ', *Energy Policy,* 38(12): 7614-7623.

Moser, S. & Dilling, L. (2011), 'Communciating Climate Change: The Science-Action Gap' in Dryzek, J.S. , Norgaard, R.B. & Schlosberg, D. (Eds.), *The Oxford Handbook of Climate Change and Society,* Oxford: Oxford University Press.

Mourik, R M, Breukers, S, Heiskanen, E, Bauknecht, D, Hodson, M, Barabanova, Y, Brohmann, B, Burger, V, Feenstra, C F J, Jalas, M, Johnson, M, Maier, P, Marvin, S, Meinel, H, Pariag, J, Rask, M, Rinne, S, Robinson, S, Saastamoinen,

M, Salminen, J, Valuntiene, I & Vadovics, E (2009), *Deliverable 6: Conceptual framework and model, Synthesis report tailored for policy makers as target group. A practical and conceptual framework of intermediary demand-side practice*, Programme, Seventh Framework, Changing Behaviour.

NESDO (2009), *Ireland at Another Turning Point: Reviving Development, Reforming Institutions and Liberating Capabilities,* Dublin: National Economic and Social Development Office.

Nielsen, L. (2010), *Social Acceptance of Wind Energy Projects: State of the Art in Denmark*, IEA WIND TASK 28. http://www.socialacceptance.ch/images/State-of-the-Art_Acceptance_Wind_Energy_Denmark.pdf.

Nye, M., Whitmarch, L. & Foxon, T. (2010), 'The Roles of Domestic Actors in Transition to a Lower Carbon Electricity Economy, Environment and Planning A 2010, volume 42, pp 697-714', *Environment and Planning A,* 42: 697-714.

Ockwell, D., Whitmarsh, L. & O'Neill, S. (2009), 'Reorienting climate change communication for effective mitigation: Forcing people to be green or fostering grass-roots engagement?', *Science Communication,* 30(3): 305-27.

OECD (2000), *Ancillary Benefits and Costs of Greenhouse Gas Mitigation*, Paris: OECD.

OECD (2008), *Household Behaviour and the Environment: Reviewing the Evidence*, Paris: Organisation for Economic Co-operation and Development.

OECD (2010), *Environmental Performace Reviews: Ireland*, Paris: Organisation for Economic Co-operation and Development.

OECD (2011), *Greening Household Behaviour: The Role of Public Policy*, Paris: Organisation for Economic Co-Operation and Development.

OECD (2012), *Farmer Behaviour, Agricultural Management and Climate Change*, Paris: Organisation for Economic Co-Operation and Development.

Owens, S. (2000), 'Engaging the Public: Information and Deliberation in Environmental Policy', *Environment and Planning A,* 32(1141-1148).

Page, M. (2010), 'The Public and Climate Change: Ipsos MORI Presentation', Presentation to the Scottish Government, "What Works in Behaviour Change Conference", 28 June 2010.

Palladino, R., O'Donovan, M., Murphy, M., McEvoy, J., Callan, J., Boland, T. & Kenny, D. (2009), 'Fatty Acid Intake and Milk Fatty Acid Composition of Holstein Dairy Cows Under Different Grazing Strategies: Herbage Mass and Daily Herbage Allowance', *Journal of Dairy Science,* 92(1010): 5212-235212.

Pelling, M., High, C., Dearing, J. & Denis, S. (2008), 'Shadow Spaces for Social Learning: A Relational Understanding of Adaptive Capacity to Climate Change Within Organisations, ' *Environment and Planning A,* 40(4): 867-884.

Pike, S. (2011), *Eco-detectives Teachers' Resource Pack: Environmental and Climate Change Investigations for Primary Schools*, Department of Environment, Heritage, Local Government, Dublin Department of Environment, Heritage, Local Government and Centre for Human Rights and Citizenship Education.

Pollitt, M. & Shaorshadze, I. (2012), 'The Role of Behavioural Economics in Energy and Climate Change Policy' in Fouquet, R. (Ed.) *Handbook on Energy and Climate Change,* London: Edward Elgar.

Price, P. (2013), *Policy and Value: A Case Study of Local Authority Energy Management and Retrofit Investment Appraisal,*, MSc. Sustainable Development, Dublin Institute of Technology.

Prins, G. & Rayner, S. (2007), *The Wrong Trousers: Radically Rethinking Climate Policy*, James Martin Institute for Science and Civilization, Oxford: London School of Economics and Political Science.

Purvis, G., Downey, L., Beever, D., Doherty, M., Monahan, F., Sheridan, H. & McMahon, B. (2011), 'Development of a Sustainably-competitive Agriculture' in Lichtfouse, E. (Ed.) *Sustainable Agriculture Reviews 8,* Agroecology and Strategies for Climate Change. Springer Science+Business.

Renwick, A. & Wreford, A. (2011), 'Climate Change and Scottish Agriculture: An End to the Freedom to Farm? ', *International Journal of Sociology of Agriculture and Food,,* 18(3): 181-198.

Riley, M. (2008), 'Experts in their Fields: Farmer-Expert Knowledges and Environmentally Friendly Farming Practices', *Environment and Planning A,* 40: 1277-1293.

Rogers, E.M. (1962), *Diffusion of Innovations First,* New York: The Free Press.

Rogerson, R. , Bellingham, R. & Shevtsova, Y. (2009), *Changing Behaviour and Attitudes to Sustainability: A Report for the Department of Enterprise, Trade and Investment*, Department of Enterprise, Trade and Investment, Strathclyde: University of Strathclyde.

Rotmans, J., Kemp, R. & van Asselt, M. (2001), 'More Evolution than Revolution, Transition Management in Public Policy', *Foresight,* 3(1): 1-17.

Rowntree, J., Pierce, K., Buckley, F., Petrie, K., Callan, J., Kenny, D. & Boland, T. (2010), 'Effect of Either Soya or Linseed Supplementation of Grazing Dairy Cows on Milk Production and Methane Emissions', *Advances in Animal Biosciences,* 1: 51-51.

Ryan-Purcell, O. & Walsh, D. (2012), 'Making the Most of the Welcome Winds of Change ', *Irish Independent*, 28 August.

Ryan, L. & Cambpell, N. (2012), *Spreading the Net: The Multiple Benefits of Energy Efficiency Improvements,* Paris: International Energy Agency.

Schulte, R. & Donnellan, T. (Eds.) (2012), *A Marginal Abatement Cost Curve for Irish Agriculture*, Carlow: Teagasc.

SEAI (2010), *Bringing Energy Home,* Dublin: Sustainable Energy Authority of Ireland.

SEAI (2012), *A Methodology for Local Authority Renewable Energy Strategies: Draft for Public Consultation*, Dublin: Sustainable Energy Authority of Ireland.

Shaw, K. and Maythorne, L. (2013), 'Managing for Local Resilience: Towards a Strategic Approach', *Public Policy and Administration,* 28(1): 43-65.

Sheller, M. (2004), ' Automotive Emotions: Feeling the Car', *Theory, Culture and Society,* 21: 221-42.

Sheppard, D.C. (2011), 'Social Solutions for Climate Change Mitigation and Adaptation: Cross Cultural Lessons from Denmark to the United States', *Intersect,* 4(1): 67-68.

Shove, E. (2003), 'Converging Conventions of Comfort, Cleanliness and Convenience', *Journal of Consumer Policy,* 26: 395-418.

Shove, E. (2010), 'Beyond the ABC: climate change policy and theories of social change', *Environment and Planning A,* 42(6): 1273-1285.

Shove, E. & Walker, G. (2007), 'CAUTION! Transitions ahead: politics, practice, and sustainable transition management: Commentary', *Environment and Planning A,* 39: 763-770.

Shove, E., Pantzar, M. & Watson, M. (2012), *The Dynamics of Social Practice: Everyday Life and How it Changes,* London: Sage.

Sloman, L., Cairns, S., Newson, C., Anable, J., Pridmore, A. & Goodwin, P. (2010), *The Effects of Smarter Choice Programmes in the Sustainable Travel Towns: Summary Report*, Transport, Department of, Furnace, UK: Transport for Quality of Life Ltd.

Smith, A. (2013), *The Climate Bonus: Co-benefits of Climate Policy,* Earthscan.

Smith, A. & Stirling, A. (2008), *Social-ecological Resilience and Socio-technical Transitions: Critical Issues for Sustainability Governance*, Steps Centre Working Papers, Brighton: University of Sussex.

Somerville, R. & Hassol, S. (2011), 'Communicating the Science of Climate Change', *Physics Today,* 64(10): 48-53.

Southerton, D., McMeekin, A. & Evans, D. (2011), *International Review of Behaviour Change Initiatives: Climate Change Behaviours Research Programme,* Edinburgh: Scottish Government Social Research.

Spence, A., Poortinga, W. & Pidgeon, N. F. (2012), 'The Psychological Distance of Climate Change', *Risk Analysis,* 32(6).

Stern, N. (2006), *Stern Review: The Economics of Climate Change: Executive Summary*, http://siteresources.worldbank.org/INTINDONESIA/Resources/226271-1170911056314/3428109-1174614780539/SternReviewEng.pdf.

Stern, P. (2011), 'Contributions of Psychology to Limiting Climate Change', *American Psychologist,* 66(4, May-June 2011): 301-314.

Strachan, P. & Jones, B. (2012), 'Navigating a Minefield? Wind Power and Local Community Benefit Funds' in Szarka, J., Cowell, R., Ellis, G., Strachan, P.A. & Warren, C. (Eds.), *Learning from Wind Power: Governance, Societal and Policy Perspectives on Sustainable Energy,* Basingstoke, UK: Palgrave MacMillan.

Strengers, Y. (2012), 'Peak Electricity Demand and Social Practice Theories: Reframing the Role of Change Agents in the Energy Sector', *Energy Policy,* 44: 226-234.

Styles, D. & Jones, M. (2004), *Energy Crops in Ireland: An Assessment of their Potential Contribution to Sustainable Agriculture, Electricity and Heat Production*, Final Report (2004-SD-DS-17-M2), Wexford: Environmental Protection Agency.

Sunstein, C. & Thaler, R. (2008), *Nudge: Improving Decisions about Health, Wealth, and Happiness,* Boston: Yale University Press.

Sustrans (2009), *Travel Behaviour Research in the Sustainable Travel Towns* Bristol: Sustrans. http://www.sustrans.org.uk/assets/files/travelsmart/Travel_Behaviour_research_in_the_STTs_briefing_note_June_2009.pdf.

Takahashi, B. (2009), 'Social Marketing for the Environment: An Assessment of Theory and Practice', *Applied Environmental Education & Communication,* 8(2): 135-145.

The Department of the Environment Food and Rural Affairs (2005), *Securing the Future: Delivering UK Sustainable Development Strategy*, London: The Department of the Environment, Food and Rural Affairs.

The Royal Society of Edinburgh (2011), *Facing up to Climate Change: Breaking the Barriers to a Low-Carbon Scotland*, Report of RSE Committee of Inquiry, March, Edinburgh: The Royal Society of Edinburgh. http://www.royalsoced.org.uk/cms/files/advice-papers/inquiry/climate/RSE%20Inquiry%20Facing%20up%20to%20climate%20change%20Full%20Report%20(low%20res).pdf.

The Scottish Government (2010), 'Ten Key Messages About Behaviour Change: From the 'What Works in Behaviour Change' Conference', Presentation to "Edinburgh", The Scottish Government.

The Scottish Government (2011), *2020 Routemap for Renewable Energy in Scotland*, Edinburgh.

The Western Development Commission (2007), *Communities and Renewable Energy: A Guide*, Ballaghaderreen: Western Development Commission.

The World Bank (2010), *World Development Report 2010*, Oxford: Oxford University Press.

Tilbury, D. & Wortman, D. (2004), *Engaging People in Sustainability*, Gland, Switzerland.: Earthscan/ IUCN.

UNESCO (2012), 'Educating for a sustainable future: UNESCO side-event at Rio+20 on Education for Sustainable Development', Presentation to the UNESC), "UNESCO side-event ", Rio+20, 21/06/12. http://www.unesco.org/new/en/unesco/events/education-events/?tx_browser_pi1%5BshowUid%5D=6304&cHash=e94d801926.

Upham, P, Whitmarch, L, Poortinga, W, Purdam, K, Darnton, A, McLachlan, C & Devine-Wright, P. (2009), *Public Attitudes to Environmental Change: a selective review of theory and practice*, Living with Enivronmental Change, London: Research Councils UK,.

van der Brugge, R. & van Raak, R. (2007), 'Facing the Adaptive Management Challenge: Insights from Transition Management ', *Ecology and Society,* 12 (2)(33).

Vanclay, F. (2004), 'Social Principles for Agricultural Extension to Assist in the Promotion of Natural Resource Management', *Australian Journal of Experimental Agriculture,* 44: 213-222.

Vandenbergh, M.P., Stern, P.C., Gardner, G.T., Dietz, T. & Gilligan, J.M. (2010), 'Implementing the Behavioural Wedge: Designing and Adopting Effective Carbon Emissions Reduction Programs', *Environmental Law Review,* 40: 10547-554.

Walker, G. & Devine-Wright, P. (2008), 'Community Renewable Energy: What Should it Mean? ', *Energy Policy,* 36: 497-500.

Watson, T. (2012), 'How Theories of Practice can Inform Transition to a Decarbonised Transport System', *Journal of Transport Geography,* 24(September 2012): 488-496.

Whitmarsh, L. (2009), 'Behavioural Responses to Climate Change: Asymmetry of Intentions and Impacts', *Journal of Environmental Psychology,* 29(1): 13-23.

Whitmarsh, L., Seyfang, G. & O'Neill, S. (2011), 'Public Engagement with Carbon and Climate Change: To What Extent is the Public 'Carbon Capable'? ', *Global Environmental Change,* 21: 56-65.

Winefield, J. (2005), *Recommendations for Behaviour Change Programs to Reduce Greenhouse Impact in South Australia*, Victoria: Conservation Council of South Australia.

Wustenhagen, R., Wolsink, M. & Bürera, M.J. (2007), 'Social Acceptance of Renewable Energy Innovation: An Introduction to the Concept ', *Energy Policy,* 5(5): 2683-2691.

Yan, M-J., Humphreys, J. & Holden, N. (2012), *The Carbon Footprint of Pasture Based Milk Production: Can White Clover Make a Difference?*, Submitted to Journal of Dairy Science.

Images

Sourced online at prlog.org, 5minutesforginggreen, and 123fr