‘IT’S NOT JUST ABOUT POLICY’

Climate Action, Practice, Norms and Routine

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Clare Watson[1*], Gerard Mullally[2] and Brian Ó Gallachóir[3]

1 Environmental Research Institute & Department of Sociology
University College Cork, Ireland
clare.watson@ucc.ie, web: https://www.ucc.ie/en/energypolicy/

2 Department of Sociology
University College Cork, Ireland
g.mullally@ucc.ie, web: http://research.ucc.ie/profiles/A024/

3 MaREI Centre, Environmental Research Institute and School of Engineering
University College Cork, Ireland
b.ogallachoir@ucc.ie, web: https://www.ucc.ie/en/energypolicy/

INTRODUCTION

‘*Like an exasperated gardener, we snip triumphantly at the exposed plant, forgetting how extensive established roots can be*.’
Paul Duguid (1996)

As the range of climate mitigation policies and clean technology solutions increase, as EU target deadlines loom closer, and the implications of the 2015 UNFCCC Paris Agreement hit home, the pressure is on for Ireland to cut its greenhouse emissions. However, while intentions, as exemplified in particular, by the contents of the 2015 Energy White Paper (DCENR, 2015), are good, the pace of change is painfully slow, and it is now expected that Ireland is unlikely to meet its EU 2020 emissions targets (EPA, 2016). The Irish Climate Change Advisory Council (CCAC, 2016b) recently voiced its concern that not meeting these targets ‘*will represent a significant deviation from the necessary path to decarbonising the economy by 2050. There is an urgent need to enhance implementation of existing policies and measures and to identify additional policies and measures to return the economy to a path towards sustainability*’.

The aim of this paper is to examine why progress is so protracted, with a particular focus on the role of citizens and the behavioural challenges they face in meeting the requirements of climate change policy and the energy transition. The paper is divided into five sections.

In the first section, it is demonstrated that people are struggling to ‘go green’ and to make the changes that are expected of them, largely because energy intensive actions, like showering, washing clothes, heating the house and driving, are inextricably tied up in the practice, and routine of everyday life, and

reflect the cultural norms, and social expectations of the society within which people live. Actions can also be driven by emotions and feelings, and the need for comfort, warmth, and happiness. It is extremely difficult for people, firstly to understand exactly what to do, and secondly to isolate the actions from their lifestyles. Policy on climate action has largely been driven by the rational choice model, which assumes that, on being given the facts, individuals will weigh up the pros and cons and then choose the option most beneficial to them. This has led to costly multi-media information campaigns, which have ultimately failed to foster the required level of behavioural change. It is proposed here that the focus now needs to shift away from the individual and to look at the existing social, institutional and infrastructural barriers, and in particular to examine the role of social practice.

The following three sections bring together learnings from the research literature, in relation to the challenges faced by people around retrofitting and upgrading their homes, accepting and using smart technology to regulate their energy use, and changing the embedded practices of driving, flying and eating red meat.

The final section draws together the themes arising from the research, including - the difficulties people have in identifying and implementing the required behavioural changes; how the focus needs to shift from the individual to the influence posed by social practice, norms and routine, and include the role of governments, institutions, industry and business; the challenges people face in relation to house retrofitting and their interaction with new technologies; the mixed messages they are receiving about what to do; and the importance of making the 'non-negotiable' actions easier.

SECTION 1: IT'S NOT EASY BEING GREEN

To date, much of the policy focus in relation to climate change mitigation has presumed that individuals make rational decisions based on the information before them. They weigh up the costs and benefits and then make the choice that appears to be in their own best interest (Jackson, 2005). Rational choice thinking leads policy makers and campaigners to seek to inform and educate, on the understanding that if you provide individuals with the knowledge, then their beliefs, attitudes, and intentions will change, and the appropriate action will follow. This has led to governments investing in expensive multi-media information campaigns to encourage people to act on climate change.

The British government's campaign, 'Helping the Earth Begins at Home', ran for over five years in the 1990s. It began in the broad sheet newspapers, and on national radio, and a year later moved to the tabloid newspapers and television. Yet despite this level of exposure, the initiative proved to be largely ineffective (Hinchliffe, 1996). In interviews carried out in 1992 and 1993, Hinchliffe observed that once the conversation moved from '*beyond*' the local, people's talk became less emotive. The dangers they heard about in the media seemed '*far away*' and irrelevant to their everyday lives and '*probably not going to happen in our lifetime*.' The idea of saving energy in order to reduce socio-environmental problems was regarded with some scepticism. People emphasized the challenges and seeming futility of taking appropriate action, and they felt the scope for them to make substantial or even slight changes to their lifestyles or habits was very limited. The issues of relative scale and who should take responsibility brought a comparison between one's own consumption and what was perceived to be going on elsewhere. Responsibility for global action was laid at the door of large corporate bodies and national government, who were seen as distant and not to be trusted. People expressed the futility of individuals

taking action. According to Hinchliffe, the campaign's message was '*subsumed by a catalogue of contradiction in government policy elsewhere and in the mass media in general*'.

The Irish Department of Communications, Energy and Natural Resources ran its own multi-media and outreach campaign to encourage energy efficient behaviour, between 2006 and 2009. The total spend was €10m, about €3m of which went on advertising (Independent, 2013). The Power of One campaign targeted the use of natural gas, electricity and transport fuel, both at home and work. Research (Diffney et al., 2013) on the effect of the campaign on residential natural gas consumption shows that the advertising leaflets had a '*significant, but short-lived*' effect on consumption. However, surveys administered to 1000 natural gas consumers, both before and after the campaign, demonstrated that, while the campaign raised awareness of efficiency behaviours, it had no significant effect on self-reported natural gas-saving behaviour. It has been concluded that Power of One was only capturing those who were already converted (Marshall, 2015).

In truth, what many people think they will do, say they will do, and then actually do, may differ substantially. This demonstrates the 'value-action gap', whereby some people seem to act in opposition to values they hold dear, and the 'energy efficiency gap', whereby they do not take steps to make their homes more energy efficient, even though to do so will save money in the long run.

The CONSENSUS Lifestyle Survey (Davies et al., 2014), carried out across the island of Ireland, found that, out of the nearly 1,300 respondents, 86% said they were concerned about environmental issues, 82% felt that their own behaviour could make a difference, and 58% admitted that they needed to behave in a more environmentally friendly manner. However, 62% of respondents said they would not support higher environmental taxes, and 48.9% would not pay higher prices for green goods and services.
Although 73% of respondents stated they would be willing to insulate their homes for environmental reasons, only 23% had actually done so in the preceding five years. Likewise, 79% of respondents said they knew about government energy efficiency grants, yet only 5% had availed of the grants and 91% reported that they intended to buy energy efficient appliances, but only 46% had done so in the previous five years. In a nationwide Canadian survey (Kennedy et al., 2009), involving 1664 participants, 72% self-reported a gap between their environmental intentions and subsequent actions.

The rational choice model assumes that the focus is on the individual – the '10 things you can do' approach. And it presumes that the individual is in control of how they act, regardless of what is going on around them. However, meeting the climate challenge will substantially alter the consumerist lifestyle endemic in western countries, and so coveted by everyone else. In short, if there is to be any effective reduction in carbon emissions or the use of natural resources, '*new forms of living, working and playing'* will have to take effect (Shove et al., 2012).

Shove et al (Shove et al., 2012) dispute the traditional and widely held belief that people act out of self-interest, or that new social arrangements arise out of millions of individual decisions about how best to act. They argue that this belief makes assumptions about human agency and choice, and reflects common sense theories about why people do what they do. It also aligns with the idea that behaviour is determined by a person's beliefs and values, and that lifestyles are expressions of personal choice. Focusing on individual behaviour marginalizes, and often excludes, other veins of thought, especially those around theories of social practice and transition. It deflects attention away from institutions and the part they play in defining which actions are easier, and more likely, than others. It also ignores the influence of social obligations, norms, conventions and routines.

It is argued that, when it comes to changing behaviour, social practices come to the fore and people often occupy secondary roles as the '*carriers'* (Reckwitz 2002). Practices are '*what individuals do*' to '*reflect the pursuit of shared goals (comfort, mobility) within a particular socio-technical setting*.' (Shove, 2012). To fully understand social change we need to examine how practices emerge, evolve, and fragment, and to look at who are the carriers and why they are carrying (Shove, 2010). '*Practices are not simply points of passage between human subjects and social structure. Rather, practice is positioned centre stage*' (Shove et al., 2012)

A social practice theory perspective illustrates '*that transition processes will extend deeply into the inconspicuous and normally unquestioned habits and routines of everyday life, and will demand the active involvement, rather than passive co-optation, of all sectors of society*'(Seyfang et al., 2010).

A group of Australian academics (Gibson et al., 2011) note that the term 'green', once linked with hippies and radicals, has now become '*a definitive reflection of what individuals are to become as both consumers and citizens*'. It is hoped that, once they have been educated and they assume a 'green identity', citizens and consumers will do the right thing and make appropriate environmental choices. Drawing from a baseline survey of 1,500 households in Wollongong, near Sydney, Gibson and his colleagues discovered that '*things are not nearly so linear'*.

They found that households already involved in pro-environmental behaviours, such as recycling and composting, were more likely to be interested in climate change, and to be prepared to change household behaviours. However, while some practices had become routine for most households, such as recycling, using 'green bags', turning off taps and lights, and wearing more clothing rather than turning up the heat, even the majority of the most committed households did not say they regularly walked to the shops, grew their own produce, or bought organic food, fair-trade products, or recycled toilet paper. Neither did income, household consumption, education or length of residence have a bearing on whether households were pro-environmentally active.

Other patterns of consumption were equally hard to categorise. For example:

- 43% of two-person households owned two fridges, while 36% of six-person households had just one. The most affluent households were twice as likely to install solar power (be it in very small numbers) as the poorest, but were also the most likely to use air conditioning.
- The poorest households were most likely to say that they were 'uninterested' in climate change (22% of the lowest income, compared with 3.6% of the highest income sector), but they were also the least likely to own LCD or plasma screen TVs or clothes dryers.
- The poorest households were also the most likely to repair clothing, to use recycled toilet paper, to buy eco-washing powder, to reuse glass bottles and jars, and to take shorter showers.
- Baby boomers were the least likely to be sceptical about climate change, but the most likely to fly five times or more in a year.
- The people who were most likely to buy organic or sustainable clothing were also most likely to buy more clothing than required. Yet, those who were least likely to buy too many clothes, regularly bought poor quality, cheap items carrying a heavy environmental burden.

Things become more complex when the actual emissions embedded in different products and practices are taken into account. The emissions of locally produced foods may not always outweigh those that travel long distances. Depending on the brand, the energy usage of digital set-top boxes can vary by as much as 400%, within the same price range. Many consumers are not aware of the amount of water and

energy required to produce cotton (organic or otherwise), or the geographical variation in resource use. Is it worse to waste the water to rinse out tin cans than to put them in the recycling bin dirty? Is it worse to use plastic supermarket bags for bin liners, or to take reusable green bags to the supermarket, but then buy dedicated bin liners? Should cloth nappies be used or biodegradable disposable ones? Is it right to drive the kids to sports activities? Should the environmental impact of divorce and separation (one home becomes two homes) be taken into account? How should we entertain ourselves? Going out usually involves a car trip, but energy use at the venue is shared. Staying at home may mean that each room is used by different family members, each with their own gadgets. And do people have the time to think these dilemmas through? 30% of respondents felt rushed or pressured for time 'frequently' or 'always', while a further 40% said they were 'sometimes'.

Gibson and colleagues outline their concern that the focus on households becoming more sustainable conceals '*dilemmas about practice and circumstance'*, and ignores geographical, cultural and social influences. A focus on green consumption also immediately hits up against the industrial capitalist complex, and the importance of continuous economic growth fueled by consumerism. An obvious policy conflict exists if one arm of government is encouraging lifestyle changes which threaten the jobs and livelihoods of many of their citizens – the very people who are being encouraged to go green.

Many of the activities and practices that need to be changed are hard to shift because they are embedded in people's lifestyles and in their daily routines. They reflect how people see themselves, and how they want to be seen by others. They can be driven by a desire to keep up with the Jones, to follow fashion, and to meet social expectations. For instance, people choose clothes, largely based on aesthetics, on how they want to look, to feel, and on the image they want to project. Clothes can be practical and provide warmth and protection from the elements, but they are also often iconic, symbolic, ornate, impractical, and unnecessary. Clothing is a cultural industry, defined by the logics of fashion, trends, and identity, and promoted through creative and constant advertising and marketing.

How humans wash themselves and their clothes is also determined by culture, norms and practice. Where clothes washing was once labour intensive and time consuming, it is now largely mechanized. The widespread introduction of washing and drying machines in the 1950s, and the marketing of detergents, have radically changed how people launder their clothes and their notion of what 'clean' means. Whereas in the past, worn clothes were aired before being put on again, and a certain level of odour and soiling was deemed acceptable, now many items are only worn once before being thrown in the washing machine, which means they don't last as long. Norms around cleanliness and smell have also shifted (Shove, 2003). Cleanliness is now viewed in terms of 'freshness' and 'whiteness', rather than being germ free. Likewise, it is expected to shower at least once a day, so at to avoid being sweaty or smelly.

Other activities are motivated by emotion, desire, sensory perception and fear. For instance, western toilet practices have much to do with the fact that the sight and smell of human faeces evoke emotions of disgust, and the common reaction is one of avoidance, so the waste has to flushed away as quickly and invisibly as possible. It is extremely difficult to shift the perception that a lot of water is required to most properly and safely dispose of human waste.

In a later publication (Gibson et al., 2013), Gibson and colleagues voice their concern that simplistic assumptions are becoming entrenched around what it means to be 'green'. The '*complexity of dilemmas*' involved in household choices and behaviours must not be overlooked. Progress towards a more sustainable future will require more than technological, or organizational changes. '*Households*

face dilemmas of practice and circumstance'. People are juggling '*competing priorities and pressures and imperfect information*'. A way to change or transcend cultural norms and social practice is required. The authors support a relational approach*,* which accepts that the household is entangled relationally with a variety of actors, both large and small, human and non-human*.* This approach infers that the responsibility for change should not all be left with householders, whereby letting other players, including governments, industry and businesses, off the hook.

The experience of the members of CRAGS (Carbon Rationing Action Groups), who came together to reduce their carbon emissions by working towards agreed carbon targets, demonstrates how even the most committed and motivated people find that they soon reach a limit, below which it is too difficult to venture. The CRAGS movement began in 2006 and lasted until 2010. At its height, 25 groups were operating across the UK. Research (Hielscher, 2013) on the Glasgow CRAG group demonstrated that, at the early stages, the members were full of enthusiasm, comparing details about their homes and lifestyles and pin-pointing ways in which they could each cut their emissions. However, after making the obvious changes, it became more difficult to cut back any further. Holiday options had dwindled and they lived in colder homes. On reflection, members felt that life had become quite '*grim*' and they wondered if they were distancing themselves too far from the mainstream. According to Hielscher, the experiment showed that efforts of community energy groups need to be supported by wider policy and infrastructural changes, aimed at addressing the structural and social barriers, which cannot be overcome by a group's eagerness to 'make a difference'.

SECTION 2: RETROFITTING AND UPGRADING THE HOME

In terms of what people can do to cut their greenhouse emissions, rational economic analysis sees house retrofitting as the obvious 'low hanging fruit'. On the surface, it appears to be a win-win situation – the government offers grants or Green Deals to speed up the process, and gets energy savings in return. The householder makes an initial investment which is repaid over time by reduced energy bills, and comfort levels increase in the home. However, the rational argument does not take into account the fact that decisions around retrofitting involve more than just deciding whether or not to insulate a building or put in triple glazing. Retrofitting happens to a house, and, in most cases, a house is not just four walls and a roof, it is a home - the base from where we live our lives.

As the contemporary philosopher, Alain de Bottain (De Botton, 2008) puts it:
'*The house has grown into a knowledgeable witness. It has been party to early seductions, it has watched homework being written, it has observed swaddling babies freshly arrived from hospital, it has been surprised in the middle of the night by whispered conferences in the kitchen……..It has provided us not only physical but psychological sanctuary. It has been a guardian of identity*.'

It is into this home that the government is asking to delve with its deep retrofits, and, as the evidence shows, householders are not responding as willingly as expected. Despite the fact that making their homes more energy efficient saves money in the long run, there is still an 'energy efficiency gap', with most householders discounting the future benefits.

By 2016, 300,000 homes, and 3,500 businesses and public sector agencies, had been retrofitted in Ireland (Scheer, 2016). However, about 75,000 homes and businesses will need to be upgraded every year between now and 2020 to meet the overall energy efficiency target of 20%. This figure could decrease if deeper retrofits are carried out. As a point of reference, energy efficiency grants were given

out to 25,000 Irish homes and businesses in 2014. Barring a radical shift in policy, it is estimated that between 70 and 80% of today's energy inefficient buildings will still be operational in 2050 (Pelenur and Cruickshank, 2012).

The Green Deal, a high profile pay-as-you save energy finance scheme, was launched by the British Tory/Liberal Democrat coalition government in January 2013. It was widely seen as interesting, in particular because the loans were paid back through energy bills, which addressed the problem of the 'split incentive' for landlord (but it also meant that new tenants or property owners had to pay back a debt they had not signed up for). According to the UK Department for Energy and Climate Change, the Green Deal was to be to become '*Europe's most innovative and transformational energy efficiency programme*' (DECC, 2010), and would '*improve 14 million homes by 2020 and a further 12 million by 2030*' (DECC, 2011). However, reality did not live up to these high expectations. Two and half years later, in July 2015, the new Tory government announced that it would cease funding the Green Deal as it was not cost effective. The scheme continued without government support, but has since effectively faded away. By the end of May 2016, just over 13,000 homes had been retrofitted under the programme (DECC, 2016).

The Green Deal is now seen as a substantial policy failure. Worse still, energy efficiency improvements in the UK have stalled dramatically since the introduction of the scheme. The annual number of major energy efficiency measures declined by 80% between 2012 and 2015 (Energy, 2016). Researchers (Rosenow and Eyre, 2016) say that the failure of the scheme was due to:

a) poor policy design – projected savings from the work had to exceed the loan repayments, so only upgrades with high rates of return, such as cavity wall insulation, were eligible for full funding. This meant that more expensive deep retrofits were excluded.
b) limited financial appeal – there was no government guarantee and the interest rate was substantially higher than mortgage rates and other secured loans
c) narrow engagement with consumers – the Green Deal focused on the finances and ignored the other aspirations people have for themselves in their home, such as '*comfort, well-being and health*'. Despite years' worth of knowledge around the barriers to retrofit, '*people were sold the loan instead of the car*'.

They conclude that '*even though the risks were understood and voiced by critics well in advance of the launch of the Green Deal, the logic of a subsidy free energy efficiency scheme became the accepted wisdom at the highest levels of Government, through a combination of ideology and failure to listen*'.

Even in Germany, long considered a leader in the fight against climate change, a combination of regulation, subsidies and awareness campaigns has not achieved the required results. In 2010, the German government adopted an energy efficiency program with the ambitious goal of an 80% reduction in primary energy demand in its building stock by 2050. Despite this, about 80% of Germany's housing stock is still in need of upgrades and work is moving at a very slow pace (Stieß and Dunkelberg, 2013)

According to the Sustainable Authority of Ireland (Motherway, 2010), most of the upgrades carried out are at the cheaper and less invasive end of the spectrum and 85% of the work carried out by 2010 had been funded through savings rather than loans or mortgage top-ups. When asked, people usually say that they cannot retrofit because they don't have the money. In 2015, SEAI research showed that 74% of people, who had considered investing in energy efficiency upgrades, said that lack of funding was a strong inhibiting factor. Similarly, 71% of those who had made some upgrades but didn't go further, said that lack of funds was mainly to blame (SEAI).

However, it is clear that money is not the only motivating factor, or that lack of cash is the only disincentive. '*In some ways finance is the last barrier people face with regard to energy efficiency. Before sourcing the funds to carry out energy efficiency works on their homes people must have navigated their way to a point where they are aware of energy efficiency as a product, they understand the usefulness and benefits it can bring them and they must have a willingness to tolerate some disruption and inconvenience so that they can realise those benefits* (Hession, 2013). In Hession's 'Better Energy Financing' report for the Irish Department of Energy, Communications and Natural Resources (DCENR) key barriers to the uptake of a national retrofit scheme were identified as including finance, information and awareness, motivation and behaviour, trust in energy efficiency information and builders, and the 'split incentive' between landlords and tenants. Recommendations included the provision of independent information to householders, the linking of comfort benefits to building energy ratings (BER), peer comparison and the development of peer-to-peer billing, improved communication, and the identification of existing schemes, or development of new schemes that can include energy efficiency as part of their message, e.g. Tidy Towns, Energy Towns. Hession warned that getting rid of retrofit grants could mean that people would be unwilling to take out a loan or invest in energy efficiency if the state no longer gives them a 'rebate' for 'doing the right thing'.

The UK Energy Saving Trust (EST, 2011) says the main reasons people give for an upgrade are '*aesthetics, modernization and improving the value of their property*.' For those who are embarking on a larger project the increase of space is usually a big motivator. Only 10% of people begin a project with energy efficiency in mind, only 5% are aiming to address their carbon emissions. The Trust points out that energy efficiency action can be activated at key '*trigger points'* when home improvement of any kind is being carried out in the life of the home. They challenge the assumption that a *'whole-house low-carbon retrofit',* where windows, walls and all rooms are addressed at the same time, is the only way to go. Including upgrades alongside other renovation projects on a room-by-room basis is a viable alternative, and one which may be more practical and appealing for householders.

The UK Energy Savings Trust (Trust, 2010) also suggests that area based approaches can help to motivate people who might otherwise not act alone. As well as tapping into local community spirit, they can help to demonstrate that energy efficient upgrades are the norm, as opposed to being something out of the ordinary. Another report (Economics, 2015) concludes that a co-ordinated area based approach can also encourage the development of local markets and can target areas where the energy benefits are greater, and where there is network congestion.

Research Study 1

A UK study (Mallaband et al., 2013), with the aim of learning the barriers to domestic retrofit, focused on twenty owner occupied, solid walled, houses in Leicestershire. Interviews were held with thirty four of the sixty six occupants of these homes. Participants represented a broad range of houses, household and family types, incomes, and social backgrounds. The unifying factor was the solid wall structure. The research discovered that the preferences and values of many of the householders relating to the character and physical appearance of their house, the aesthetics, craftsmanship, and the history, had a bearing on what they were prepared to do. Many were resistant to modernization, passionate about their windows, and didn't like PVC. They placed a high value on the materials and parts and so spent a long time making decisions around cost and quality. Some had a desire to ensure their property was 'in keeping' with others in the area, and they were keen to maintain national heritage. However, the researchers also noted that not all participants were so emotionally attached to their house. For some, it was simply where they lived and they didn't want to spend much time or money on renovations.

It was obvious that financial concerns may not just be about whether money is available, but may also have to do with whether there were other priorities for that money. Some householders also felt that if they couldn't afford what they really wanted, this might prevent them from making any change at all. In relation to builders the householders had had positive experiences, but some felt the quality of work was not up to standard, which put them off having any other jobs done. Other concerns were the lack of quotations, erratic time keeping or no shows, unprofessional behaviour, bad attitude to work, skill deficits, and poor problem solving skills.

Some participants felt they had no time to make the improvements, or to research the options and make decisions, or to choose good builders. The householders' perception of time and their personal capacity (life stage, other commitments, interest in the renovation job) also had an impact. Other factors, like stage of life, starting a family, elderly dependents in house, school holidays, the perceived enormity of the task, the effect of regulation on the house, lack of consensus within family, the fear of possible disruption, the need to fit around other events, lack of or contradictory information, weather, the possibility of moving in the future, and inertia, were all expressed as potential barriers to retrofitting.

The authors conclude *'It is worth remembering the rate of change that people are willing to tolerate is remarkably slow, as a result of the barriers identified here and elsewhere. At some point there may be a need to bring in an element of compulsion, to enforce a level of change, especially if large numbers of households are expected to make big changes within a relatively short period of time. However, even if a degree of coercion is introduced then retrofit will be most successful when the needs and behaviours of householders are taken into account*.'

Research Study 2

In 2010, a qualitative research project (Tweed, 2013), involving interviews and internet diaries, focused on the deep retrofit of one house which had received funding under the *Retrofit for the Future* programme in Newport, South Wales. The unemployed family, a couple with one adult son (and a dog) lived in a 1989 end-of-terrace two-storey house with a lounge, kitchen, two bedrooms, bathroom and garden. Works included internal dry lining, triple glazing, built in storage units, a new conservatory, a ground source heat pump, a heat recovery ventilation system, a solar thermal system, solar PVs, associated controls, and low energy lightbulbs.

Energy per se was not a major concern for the family and was rarely discussed, neither were carbon emissions. However, draughts and cold temperatures were a big issue. By and large, the householders were happy with the changes. Alongside the thermal comfort, they also appreciated the sound insulation provided by the new windows and doors, and the heightened level of security. However, analysis showed evidence of a rebound effect with overall temperatures rising after the retrofit, showing that the occupants opted for warmer rooms rather than cost or energy savings - with April temperatures on average 3^{o}C higher than during the April before retrofit. The study also cited the family dog as having an influence on overall energy consumption. The needs of the dog were paramount in the householders' daily routine, which often meant that internal and external doors were left open to allow the pet free passage in and out of the house!

Research Study 3

A research project (Gill et al., 2015) conducted in temperate Australia interviewed twenty homeowners to explore their experience of living with, and using, their solar hot water systems. The researchers inspected the systems and, where possible, obtained energy bills. The interviewees were of varying ages

from their thirties to seventies and came from a range of socio-economic backgrounds and household types. The results showed that participants were either 'active' or 'passive' users of their panels and this depended on their attitude towards, and level of interest in, the system. Nine of the twenty participants had tried and failed to engage, and so reverted to seeing the SWH technology as a background addition to their water heating system. They did not change their practices and expected hot water to be available on demand, which required pretty high levels of boosting.
To me the point of a utility is that I don't have to think about it. I just want it to be invisible. As long as it's invisible, I'm happy (Female, 35–44, couple only).

Of the eleven who were actively involved, ten were unhappy about certain aspects of the installation or operation. Because of the complexities around the technology most participants relied on installers for advice on the type of system and where to locate it. Concerns were expressed about whether this advice was unbiased, and the researchers identified many problems with siting, insulation (seventeen installations lacked adequate insulation), sizing, piping, and supporting structures. Seventeen of the participants reported receiving very little explanation from installers on how to operate their systems to ensure maximum savings and there was no follow-up support.

Most of the participants, including all nine passive users, were confused about whether they were saving money or energy. And, despite the fact that some of them were well educated, there was a general lack of understanding about how their system worked and how it was affected by daily washing routines.
I realize that there is absolutely no way most people would be able to find their way through this minefield, you know…and most people don't have the wherewithal to do that, I don't think, you know? I find it difficult enough… I have a PhD; I should be able to do these things! (Female, 65+, couple only, active user)

Consumption was tracked for nine of the twenty participants, using their utility bills. Only two were deemed to be operating 'effectively'. The rest were operating 'ineffectively' or only 'moderately effectively' – five of these latter groups were passive users. However, of the three active users who provided energy bills, only one had a 'demonstrably effective' system, one was listed as operating ineffectively and one as moderately effective. Which shows that active management may not be enough to overcome the hurdles. While some participants had experimented with the timing of their showers, seventeen of the twenty participants had made few, if any, changes to their hot water use. Any changes focused on technical tweaking rather than behaviour modification.
I wash the dishes at 9:30, 10:00[pm] and if there's not enough hot water then to make you feel comfortable doing the dishes, well then switch it on. Otherwise we'll be freezing under the shower, which is not a good start to the day. (Female, 65+, couple only)
Experimenting and then finding that we don't have hot water in the morning is a pain in the butt. So you try not to, it's not an experiment that has kind of the neutral result to it. So we did it just for a very, very short time…We didn't know what it was actually doing, we didn't want to not have the hot water, okay we do want to stop our carbon footprint, but we have to face it, to be honest, we don't want to not have hot showers. (Male, 35–44, couple with dependent children, active)

The research found that installing solar thermal panels appealed to people's sense of 'environmental citizenship' and of doing the right thing. One participant whose system was operating at a highly ineffective level said:

I think I just enjoy using it more because when it kicks in I think the sun is doing this and now you're telling me that this is the electric boosters doing this…but no, I haven't changed anything. I just feel smug. I enjoy feeling smug. (Female, 35–44, single person household)

The researchers noted certain behaviours and beliefs which impacted negatively or positively on energy efficiency, including checking the weather, understanding electricity prices, monitoring of bills, boosting, expectations around installation of the system, ease of use, and the temperature of water it would provide, and how this would fit into routine washing practices. A key finding of the study was that many households may not be knowledgeable or interested enough to make the most of this technology, and no post-installation support was available to help them. There was also a clear indication that most participants were not prepared to change their shower routines, including timing, length or regularity, so relied on boosting where necessary. But boosting is complex and its efficient use requires knowledge and understanding on the part of the householder, and a recognition of how best to serve the washing requirements of family members, while also operating the system efficiently.

Current policy is geared towards grant aiding only the purchase and installation of solar thermal systems, with the presumption that energy efficient results will automatically follow. The authors recommend that policy be amended to ensure installation quality, and to provide householders with independent pre-purchase advice and practical guidance on how their system works. Post-installation support should be provided to assist people to live with their systems, and, in particular, to encourage new habits around hot water use, weather, and booster operation.

Research Study 4

Research (Watson et al., 2015) was conducted on a three-year trial, funded by the Australian government, which used a community partnership approach to encourage and support low-income households to improve comfort levels and save energy in their homes. A key aim of the trial was to encourage the development of local leadership in the area of home energy use. The idea was to recruit, upskill and support local people to build community networks of action, and encourage others to cut their household energy use. Recruits did not already have positions of leadership in the community or any particular experience of, or in some cases, interest in energy efficiency.

Twelve local people were recruited as 'energy champions', alongside a 'community engagement officer'. The job lasted fifteen months and all were paid for their involvement. Training was provided on communication skills and issues around energy efficiency, including home energy use and auditing. A community engagement strategy and plan of action was designed and implemented by the team in 2014 – activities included information events, men's shed workshop, sewing workshops making door snakes and curtains, educational activities in the local school, door-to-door canvassing.

A number of problems were encountered along the way. It was difficult to recruit local champions, even though the position came with a pay-check, and the co-ordinator had to be brought in from outside. Not all the energy champions were suited to their leadership role, sometimes taking responsibility was a challenge, and at times their enthusiasm waned. Getting people to attend the home energy events was difficult. Eleven of the forty five events drew no participants at all. Transfer of responsibility from the community engagement officer to the local champions was planned but did not happen. There were significant capacity gaps, and on-going support and management was required throughout the project.

However, the project succeeded in fostering genuine involvement and overcoming barriers to participation. The local champions had a good sense of the barriers faced by their community, which

helped in the design of locally tailored energy saving messages. The energy champions benefited substantially from the training and experience, particularly in relation to confidence building, and making structural changes to their own homes and managing their energy use.

The overall conclusion from the research was that it is easy to be overly optimistic about the potential for community action in an area already beset by problems, with a low level of education and civic engagement. In reality, this kind of community partnership approach was challenging and, on balance, the inhibiting negative factors outweighed the positive. To overcome the problems more time, funding and support would be required. Nevertheless, while the capacity building approach is time consuming and costly, it allows for the implementation of creative and local solutions to participation barriers. This contrasts with other more top-down initiatives which tend not to attract low-income households. The researchers suggest that there needs to be on-going evaluation of the outcomes and the supports and funding required to ensure the approach is effective – and costs and benefits need to be analysed in comparison with other possible energy saving interventions.

Research Study 5

Silicon Valley Energy Watch (SVEW) is administered by the City of San José in partnership with the Pacific Gas and Electric Company, to provide energy efficiency resources throughout Santa Clara County in California. In early 2011 SVEW launched a Community Energy Champions grant, and subsequently awarded funding and technical assistance to sixteen local agencies. The aim of the grant was to establish a framework which empowers community based organisations to stimulate energy efficiency measures in their area. As well as providing grants to organizations the programme also used the 'train the trainer' model to provide technical assistance, energy efficiency starter kits, site visits and information on policy, messaging and where to access relevant resources. This prepared staff and volunteers to implement energy efficiency programmes in their areas.

The programme was largely completed by the end of 2012, and the overall conclusion was that it had been a success. The various campaigns had connected with over 19,000 consumers. The programme report (Watch, 2012) stated that part of the strength of this approach was the ability to '*integrate multiple community needs and complex responses into single, coordinated initiatives*'. As well as identifying pre-energy efficiency barriers the approach was able to target non energy benefits, such as public health and community cohesion, directly. Using local agencies to run behavioural change campaigns in their own area had a number of key advantages. Disengaged residents were more likely to trust the messages and information disseminated by representatives of their own community organization than those from government or state agencies. Community based organisations are ideally placed to act as a conduit between the communities they serve and government. They understand community needs and the barriers to energy efficiency in their area, so are well placed to design local strategies and to ensure local participation. Local organisations are able to reach marginalized households with low cost methods. They are used to managing multiple funding streams and planning and implementing long term, multi-faceted programmes. They can embed the energy efficiency message within contexts relevant to the local community, such as public health.

It was noted that the well-established organisations were best able to integrate the new campaigns into their existing programmes, and with strong core teams of staff and volunteers were able to overcome the challenges as they arose. The organisations who understood their community and their needs, and who were known and trusted in return, and who were well networked with other organizations in the area, had most success. While some prior experience in the area of energy efficiency was beneficial (in other cases it was not), it was not a pre-requisite to success. Community trust, creative outreach

methods, and strong organizational structures were the important factors. Free home audits, with education and installations resulted in immediate behaviour change. Most of the organisations said they would have benefitted from a longer time frame to develop their strategies. Finally, it was noted that standard performance tests do not account for the social benefits of involving marginalized communities, or of addressing multiple needs.

Research Study 6

The US Department of Energy has been running a Weatherisation Assistance Programme (WAP) since 1976, providing grants for free energy efficient retrofits for self-referring low income households. A case study (Reames, 2016) focused on a community based approach which offered WAP funded energy upgrades in an area which included five low income, African American neighbourhoods, known as the Green Impact Zone in Kansas City, Missouri. Interviews with key stakeholders indicated that the targeted community based approach was key in identifying participation barriers and finding appropriate solutions, that fitted with the cultural and practical needs of the host community. However, in September 2011, state funding was withdrawn before the completion of the project, due to the slow progress in meeting stated goals. 329 homes (just less than 50% of the target) had been retrofitted.

Trust was an important factor and, at times, a barrier in the project. Interviewees described a general distrust of government, and of other people. Some parts of the neighbourhood were no-go areas, where people would neither go out nor answer their doors. They were reluctant to listen to the energy canvassers or to take their leaflets. In order to overcome this barrier, the project worked with neighbourhood associations and local residents, who were locally credible. Together, they developed a system of trusted block captains who helped to recruit local households and assuage people's fears about energy audits – one of the fears being that the house owner would incur penalties for being unable to maintain their home. The split incentive barrier was a particular problem as the area contained a high proportion of privately rented low income houses.

The key lesson for policy arising from this study is that, while there is great potential for such programmes, the most effective implementation '*requires a policy framework flexible enough to allow for the unique physical, social, and institutional environments of target communities'.*

Research Study 7

A study (Moy, 2012) of over 7,000 households in the Illawarra area of Australia, during the drought years of 2005–2007, showed that the households with retrofitted rainwater tanks reduced their mains water consumption by 10.26%, which was pretty much on par with the wider community (10.8%).

During the drought, the NSW authorities introduced water restrictions which significantly constrained outdoor water use. People with rainwater tanks were allowed to use them to preserve their lawns and gardens and to keep pools filled. Non-tank households were forced to cut back on, or at times cease, their outdoor water activities. This encouraged many households to install water tanks. 90% of those in the study had no indoor connections. A culture of high water use was evident throughout the qualitative analyses for many rainwater tank owners. Garden and pool activities were seen by them as enjoyable and essential parts of their culture and everyday practices.

By and large, the tank wasn't seen as a way of saving on indoor water use. It was more seen as a means to 'use water'. When asked about the possibility of connecting his tank indoors, one householder, Ivan, said, '*I can't see any point in it. You see you're not restricted to the use on a washing machine. You were on your garden, you see. That's why I didn't do that'* [connect indoors].

According to Glenda, '. . . *you don't save much [money]. I mean, water itself is fairly cheap, but it's just that freedom that if I want to hose the concrete, I'm allowed*'.

The study found that, while the source of some of the water may have changed, in general, most of the high-volume water behaviours remained unchanged. Despite generous rebates, only 5% of the households surveyed had indoor connections. For those whose tanks fed into the toilet and washing machine, there was a 20% average decrease in water use. The qualitative questioning showed that most households felt they did not 'need' the indoor connections. Many also felt that the quality of the rainwater was questionable, even 'dirty' which meant that it was not suitable for use indoors.

SECTION 3: THE ROLL-OUT OF 'SMART TECHNOLOGY'

Energy is '*seemingly pure, invisible, clean and cheap*'. People do not fully understand what it takes to ensure that lights come on at the flick of a switch or the impact this has in a wider context (Sovacool, 2009). When electricity was introduced into people's lives, the mode of transmission was very visible, with housewives worrying about the mess (not to mind the danger) which the unsightly wires created around the house (Shiels, 1984). Energy is now '*doubly invisible*' (Hargreaves et al., 2010) to householders. While seen as an important and essential part of modern life, it mainly travels into, and around, the house hidden in walls and roof spaces or in boiler rooms and hot water closets. The only sterile reminders are switches, sockets, dials and of course the radiators and appliances themselves. The use of energy is also invisible, as it is such an integral part of life, so taken for granted, and enmeshed in our habits and daily routines (Shove, 2003). It is therefore difficult for people to pin-point when, where and how they actually use it.

Demand side management (DSM) is seen as being a way of making the invisible visible and involves a variety of technologies aimed at assisting the consumer to be more engaged and efficient energy users. The development of a 'smart grid' and the roll-out of 'smart meters', and accompanying in-home displays, or smart energy monitors that provide real-time feedback to householders on energy use, costs across time scales and greenhouse gas emissions, are seen as being integral parts of this energy transition. Rational thinking presumes that this will encourage people to save energy, save money and to ultimately cut their emissions. However, practice theory would caution policy makers that a catch-all solution may not be appropriate as each household has its own specific energy consuming practices. Rather than being viewed objectively, feedback on their energy use will be seen through the historical, cultural, social and practical lens of the consumer, and may have little effect on what are seen as non-negotiable actions.

Research is already showing that the 'smart technology' strategy is having mixed results – trials and reviews indicate that energy savings can be as low as zero per cent in some households or as high as 20% on others, and several studies indicate that reductions may not last over time (Strengers, 2011).

Research Study 1
An online survey (Spence et al., 2015) examining public perceptions and acceptance of a range of demand side management (DSM) options amongst nearly 2,500 UK residents showed that while cost may be seen as a likely reason for people to take up the measures, those most concerned about energy prices are actually less likely to accept DSM. Acceptance was also significantly lower from those consumers who used a pre-payment electricity meter, largely representing people in fuel poverty. One

fifth of respondents, particularly those concerned about affordability, showed a reluctance to share their energy data, which may reflect a sense of powerlessness and a lack of trust in authority.

On the other hand, people who are already concerned about climate change are more likely to be accepting of the DSM measures. The study concludes that '*substantial public engagement and further policy development*' is necessary to ensure a successful roll out, and that, while financial frames proved more popular, environmental frames should not be ruled out.

Research Study 2
Qualitative research in Australia (Strengers, 2011), involved interviews and household tours with 28 families using in-home display (IHD) systems. The systems had traffic light feedback, which indicated whether householders were consuming a low (green), medium (yellow) or high (red) amount of electricity. It was found that, while a yellow or red light resulted in feelings of danger, urgency and a sense of responsibility, the traffic lights also seemed to have the opposite effect, whereby a green light could be seen as endorsing certain practices at those times of the day. Beyond the small, sometimes vague, and well promoted 'easy' actions, like avoiding waste, turning off taps and light switches, installing energy efficient appliances, and not leaving gadgets on standby, many householders considered IHD consumption feedback as being largely irrelevant, because it made them aware of practices which they considered to be inflexible and non-negotiable.
It might be nice to know that the toaster is this and the kettle is this, but I don't know what I'm supposed to do about it — have cold tea? [interviewee response]
While it may act like *'a conscientious pinch on the arse from your mother'* [interviewee response], the feedback did not impact on current lifestyle expectations.

The researchers recommend that IHD feedback should shift from providing facts and figures to tackling the meanings and competencies behind resource use practice, perhaps providing practical advice on how to wash, heat or cool in a more energy efficient way, and encouraging debate on what is 'normal' behaviour. In failing to engage in this way, there is a risk that IHD feedback will be seen by householders as largely irrelevant. After an initial period of enthusiasm, the devices will become obsolete and forgotten.

Research Study 3
UK research (Balta-Ozkan et al., 2013) analysing the social barriers to the adoption of 'smart homes' involved interviews with experts and deliberative workshops with energy consumers. Obstacles identified by the experts included current energy inefficient lifestyles, the complexity of the technology, interoperability and standards, reliability, and concerns over privacy and security. On the other hand, the barriers for the consumers were perceived loss of control and the 'dumbing down of people', apathy, reliability, the view that the technology is divisive, exclusive or irrelevant, concerns over privacy and data security, higher maintenance costs, and trust.
While there seemed to be agreement on the more practical difficulties, discussions with members of the public highlighted '*deeper, moral concerns about human nature, inequality, and trust'.* Householders also suggested that government and businesses need to lead by example. The authors recommend that communication efforts should not only focus on the practical benefits of smart home technologies, but should also include the social benefits and the importance of collective action.

Research Study 4
Drawing on interviews with 15 participants of a 'Visible Energy Trial' in Eastern England (Hargreaves et al., 2010), research demonstrated that most of these engaged and interested participants preferred the

metric of money, and dismissed information on kilowatt hours and carbon dioxide emissions as 'meaningless'. They were particularly interested in how 'greedy' certain domestic appliances were. The comparison between the energy use of different appliances made sense to them. However, many made the point that certain appliances, regardless of their energy use, were essential and could not be done without. These ranged from '*kettles to fridges to tumble driers and fish-tanks - Each household had a different list'.*

Participants felt that the device needed to be placed in an obvious, visible position, in the kitchen, hallway or sitting room, where it could be monitored regularly. The aesthetics of the device and whether it looked 'neat and tidy' was also important. Nevertheless, after a period of initial interest and enthusiasm, there was a tendency for usage to fall off over time, in some cases to almost zero.
In most cases, one member of the household, usually a man (though not always), took the role of chief monitor. This often lead to contentious and difficult household disputes. Older children were particularly reluctant to engage. Almost all of the interviewees said that the monitor showed the importance of buying energy efficient appliances. However, it was rare for participants to use the information as a trigger to plan new routines or practices which would save energy. The more common response was to say that any modification or change would be impossible. '*Life is for living*'. A '*comfortable, well-lit*' home was important.

There was a sense that the consumers had no control over what they consumed. This apparent lack of control, alongside the information provided by the monitors, created anxiety that they were spending too much money or causing harm to the environment, but this did not spur any action. A number of the interviewees said that they felt there was only so much they should be expected to do – which created resistance to the information provided by the monitor. Likewise, all interviewees said they could do little to change the times of certain practices like showering and washing clothes. To even consider it would require substantial financial incentives.

Participants found that the wider social and policy context was not supportive, or conducive to change. They mentioned the lack of practical information on which appliances are best, the fact that there are no ready answers for choices that have to be made ('*does a low-wattage but slow-boiling kettle use more electricity than a high-wattage, fast-boiling one?').* Some wanted to know what others in their area where using to provide a benchmark. Manufacturers were criticized for making inefficient appliances, as were local authorities for unsupportive planning policies, housing developers for not building energy efficient houses, and government for failing to act on their own rhetoric. Most interviewees felt that they were on their own in their efforts to save energy and reduce emissions, and some said that the lack of institutional support was why they were not doing more.

The researchers concluded that 's*mart energy monitors, it would appear, are only as good as the household, social and political contexts in which they are used'.*

Research Study 5
Follow-up research to the previous study (Hargreaves et al., 2013) involved qualitative interviews with 11 of the 'Visible Energy Trial' householders after a 12-month period of living with their energy monitors. The paper suggests that, over time, smart energy monitors gradually become '*backgrounded*' in the routine lives of householders. Explanations from the participants included general laziness, forgetfulness, slipping back into old habits, minor technical difficulties, and the fact that the devices stopped providing new information.

While the monitors did increase people's knowledge of how much electricity they are consuming, beyond a certain level they did not necessarily result in energy savings. After responding to the initial 'nag' factor and a period of switching off, turning out, and reducing 'bad' usage, over time householders came to accept their energy usage as 'normal' and impossible to change any further – the nag factor turned into an irritation, and lead to frustration around the lack of policy and market support.

Over the year, some initial inter-familial conflicts had been resolved, while, in others, the resistance was ongoing and in some cases the monitors had been moved to other parts of the house, as arguments continued. Compromises were more easily reached over leaving lights on than on issues such as temperature levels and tumble drier use.

A level of defensiveness was evident when interviewees were asked whether they could do more, with people, particularly those on lower incomes and the elderly, feeling that they should not be singled out or made to feel guilty about what they considered to be normal and acceptable usage, especially as other households, businesses and government were being far more wasteful.

Research Study 6

Another study looking at how consumers interact with feedback from an energy consumption display (Oltra et al., 2013) was conducted over a two month period, as part of a real time feedback pilot project by the Barcelona Energy Agency. It involved focus groups, interviews and diaries with a small sample of householders and concluded that feedback only works if the participants are already strongly motivated to save energy. Those who are motivated interact frequently with the display, while those who are not are likely to ignore it. The researchers note the importance of '*more intuitive and appealing*' feedback and acknowledge that initial savings and enthusiasm may not hold up over time. They call for more research into how feedback can attract and maintain engagement over time, and how motivation can be increased through group-based interventions and normative approaches.

Research Study 7

In a series of three workshops, researchers (Piccolo and Alani, 2016), discussed values, motivations, and barriers to saving energy, with eight community leaders involved in energy saving campaigns in Liverpool.

The first workshop involved the community leaders working on a Value Tree, linking their values with a commitment to the environment and saving energy. They were asked to write down why it is important to save energy, how to do it, and the barriers to action. Most of the responses around why you should save energy focused on saving money - As one participant stated: "*Money appears as the most important aspect of saving energy. For almost everyone*". There was confusion when discussing how to save energy, the values of small actions and uncertainty around consequences. "*We need to know the impact of tuning off the lights*". "*Hard to find what is more important cause people don't know the consequences. We have to identify the vampires, not the small things*." The heating, a typical "*energy vampire*" was then discussed: "*How much are you are going to save if you turn the central heating down by 1-2 degrees*?", which triggered health concerns: "*There are bounces between practical usage, safety… We need to consider that when passing information to people*." (referring to the experience of elderly people skimping on the heating to save money). The compromise between lifestyle and saving energy, and the difficulty in changing habits, were seen to be major barriers.

In the second workshop participants were invited to take part in a House Mapping activity, which involved drawing the layout of the community centre, and pin-pointing appliances and points of energy

usage. They were then encouraged to represent their feelings about their energy use on the map. The discussions focused largely on the infrastructure and building restrictions, and on the kinds of appliances in the centre. There was no discussion about current energy practices and behaviour, or on how the appliances were used.

The participants were offered energy monitoring kits and smart plugs for use in the Centre or to take home but they had little interest in using them. Two people agreed to take them home, but one returned their kit, saying they were unable to install it. The group was asked to work out the energy cost of the room with ten desktops, but chose to search for the typical consumption online rather than using the smart plug supplied to get the actual figures. In the third workshop the discussion focused on collective knowledge around energy use, and the different actions that can be taken to conserve energy. It was acknowledged that to answer these questions the participants would need to measure their actual consumption, but the group still resisted using the smart plugs.
"*I think these monitors are focused on people who know how to use [Information Technology]. I don't think anybody in our community would get involved*".

This research was carried out with community leaders who were involved in helping other people in their communities to engage with energy conservation. The people with whom they were working came from low income areas and included elderly people living alone. Other projects and utility companies had offered smart monitors for distribution in the past, but these were similarly rejected. As they were unable to use the monitors, or to make sense of the feedback, themselves, the leaders did not feel it was appropriate to distribute them to others in the community.

Research Study 8
Qualitative research (Mallaband et al., 2016) was conducted with nine households in the East Midlands of the UK in order to understand how people used the new smart heating controls in their homes, and whether improvements needed to be made to the design. Each house was owner occupied and had gas central heating. Following an initial visit and interview, a new heating control system (central in-home display, with temperature sensor, and a mobile phone app) was installed in each home. Follow up interviews were held and each participant was filmed carrying out three tasks to demonstrate the usability of the controls.

Initially, participants were asked to explain their understanding of some typical words found in heating systems, including: 'set-point', 'boost', 'advance' and 'auto'. The response was mixed. When asked to explain what was meant by 'set-point', one person said "*I'd think of tennis'*. In relation to 'advance' another responded "*That...probably means moving forward, I suppose*". Some participants were very satisfied with the mobile app: "*I don't know how I managed without it...Especially when I'm out and about*". But others failed to see the need for it at all: "*Why would you want to use an app when you're driving home from work? I think, it's…all a little bit of a gimmick…it's almost, the technology's too complicated for itself*".

All of the respondents had concerns about consistency. They had difficulty finding the required functions on the screens and felt they were not well laid out. They also presumed that the device would have 'touch screen' capability which was not the case and much greater pressure was required, whereby causing frustration and errors. When mistakes were made on the screen, people were only aware of this when the system didn't perform as expected. The system didn't alert them of the error as it was made.
"*Every morning I would wake up and go, phew, bit brisk [cold] in here today, look at the timer and go, yes, I didn't do that right again, did I?*".

External errors sometimes caused problems with respondents' interaction with the heating controller (one person keyed in their data and lost it three times), which reduced trust in the system and so it was blamed for any further errors.

When asked to complete the three tasks, eight out of the nine participants had no trouble setting the temperature of their heating system. Setting the timer so that the heating came on at certain times was more challenging, and took much longer, with only six out of the nine completing the job successfully – two didn't even attempt the task, one saying she would ask her husband later and the other looking to check the manual. People were then asked to set up a frost protection temperature, which involved using a passcode to access the maintenance area of the system. Many participants were unable to find the area, and, with no particular pattern to their searching, just pressed random buttons in the hope of landing on something relevant. Four of the nine participants gave up immediately. Only one managed to complete the task successfully. Interestingly, one participant who could not complete either tasks 2 and 3 still rated the activity as being relatively easy. Many said that they were wary of doing the various tasks as requested as they did not want to mess up their own heating systems, which showed that they were not confident in using the controls to ensure that the system reverted to its previous settings

The conclusion was that more effective new systems should be developed to meet the needs of the users. While the '*resourcefulness and perseverance'* of householders ensures that they operate their heating systems in an '*acceptable*' manner this may not be the '*most efficient'* way, in either financial or energy terms.

SECTION 4: EMBEDDED PRACTICES

As is evident from the previous sections, many energy and resource intensive practices are embedded in people's daily lives and appear to be very hard to change. None more so than driving, flying and eating red meat.

DRIVING

During the Celtic Tiger era (1995-2007), Ireland experienced an unprecedented level of economic growth, which resulted in a dramatic increase in the number of cars on the road, and earned the country the dubious distinction of becoming one of the most car-dependent societies in Europe (Davies et al., 2014). While the recession brought with it a noticeable dip in car sales, and subsequent government initiatives had some success in encouraging more fuel efficient vehicles, the general rate of car ownership is on the rise again. New car registrations increased by 17.5% in 2016, when compared with the year before. The number of new car sales was the highest since 2008 (RTE, 2016).

Emissions from the transport sector increased from 9.1% to 19.5% of total emissions between 1990 and 2014 (CCAC, 2016a). Transport emissions are projected to be 29.3% of the total non-ETS emission by 2020 (EPA, 2015). Despite pledges by the Fianna Fail/Green Party government in 2009 to have 230,000 electric cars (10% of the car stock) on the road by 2020 – this figure was subsequently downscaled to 50,000 - and despite a grant of €5,000 and VRT relief, there were only 500 fully electric vehicles on the road by the end of 2016, with 1,000 projected for 2017 (IrishTimes, 2017).

People are being given mixed messages about driving. As one wing of government exhorts people to drive less and to use public transport, another funds new motorways, cuts funding for public transport, and looks to car sales to determine the buoyancy of the economy. While advances in engineering have improved the efficiency of car engines, at the same time, the size of vehicles has increased substantially, partly due to the shift to 'crossovers' and SUVs, and also the need for more boot space (York, 2006).

According to Marsh and Collett (Marsh and Collett, 1986), the car is "*the most psychologically expressive object that has so far been devised*". The driver of the rusty Beetle and the person at the helm of the gleaming turbo-charged Porsche both make equally powerful statements about themselves. The fact that people would use their car as a vehicle for self-expression was lost on Henry Ford whose main aim was to make the Model T affordable to the masses. He was willing to offer his customers any colour they wanted, provided it was black. Things changed when Harley Earl took charge of styling at General Motors in 1929. During the next 30 years, Earl transformed the basic shape of the American car and the way that Americans saw themselves. He lengthened and lowered, added wraparound windscreens, rocket exhaust tail lights and elaborate fins. Rather than focusing on engineering advances he gave people the illusion of improvement – introduce a different look, a new colour and then sell the promise of upward mobility, and a fear of being left behind. In the early 1920s, Henry Ford was producing every second car in America and GM had 25% of the market. By the early 1930's the situation had reversed, with GM holding half the market and Ford only a quarter.

Cars are not just about image and status. They also offer freedom. Who can forget the feeling of independence when you first learn to drive? For the young at heart the car conjures up images of speed, excitement and vitality, and for women it means safety. A car offers privacy and time away from the hurly burly of life. Cars are cool, and they play a big part in our musical world - Cars (Gary Newman); Cars and Girls (Prefab Sprout); Cars and Guitars (Tori Amos); Car Trouble (Adam and the Ants); Chasing Cars (Snow Patrol); Daddy's Gonna Pay For Your Crashed Car (U2); Don't Drive My Car (Status Quo); Drive my Car (The Beatles); Driving in my Car (Madness); Fast Car (Tracy Chapman); Get in My Car (50 Cent); Used Cars (Bruce Springsteen). There are quite a few songs about trains and occasional references to bicycles, jet planes and ocean liners. Few people sing about buses.

Research Study 1

Research (Waitt and Harada, 2012), using interviews and participant diaries, conducted in 2009 in Burraneer Bay, southern Sydney, concluded that '*personal responsibility for mitigating climate change by changing transport behaviours is trumped by the ways in which travel habits help shape, and are shaped, by space. This reciprocity becomes more evident taking into consideration the cultural meanings and embodied knowledges associated with driving*'.

Several participants spoke of a love of car mobility reflected in bodily comfort, of the peace and quiet, and sense of space from outside stress and danger.

Traffic very heavy due to long weekend, but listened to radio and music. Thoroughly enjoyed being back in the smooth, quiet, cocooned comfort of the X5[BMW four-wheel drive]. Nice relaxing journey despite the traffic. Diary, Phil (general manager, 40-50 years)

Light drizzle; what a comfort it is to go door to door (almost) by car, low heat on, listening to 2RN. Warm, quiet and comfortable. With the car windows closed, it almost excludes the rest of the world. …I'm beginning to think I DO have a love affair with my car. Diary, Harry (retired, 60 plus)

Some like the feel of driving:

Like I said to you, I did test drive the hybrid Lexus...it is really boring. The whole lay out of the car. I didn't really like the driving position in it. I just felt completely disconnected from the driving experience, it was all very smooth, and it was almost like getting into an automatically driven bus or something. The nice thing about the BMW is that they still put sports suspension on it, you can feel the road a little bit more and the steering is very precise. You can have the performance of the engine if you want it to be a quite racy vehicle. I like the feel of this. I test drove the Audi as well… I like that very much. I just thought it [the Audi] was very ugly…… Interview, Phil (general manager, 40-50 years)

Car mobility allowed for convenience, comfort, and door-to-door accessibility, when and where required. Driving a car was seen as a 'right'. In contrast, public transport was '*wrapped up in narratives of aesthetics, worthiness and the logic of othering*'. The notion of timetables, smells and sounds evoked feelings of '*displacement, vulnerability, fear and disgust*'.
I've got no idea what the cost benefits would be, and they [trains] are so filthy. I can't stand them because they are so filthy. Interview, Anna (teacher, 40-50 years)

According to Waitt and Harada, cost alone will not get people out of their cars. Driving is '*convenient, comfortable, safe, and private'*. Car ownership is an expression of '*caring for family, sociability, independence and social status*.' Public transport is seen as being '*dangerous, dirty and unreliable*'.

Research Study 2
A small-scale, qualitative case study of suburban mothers in Sydney (Dowling, 2000), suggests that they use the car as a management tool, an aid in carrying out complex daily routines and as a way of demonstrating `*good mothering*'. Car use by mothers intertwines with their aspirations for their children, and also their identities as mothers. The car allows them to multi-task, and to successfully juggle paid work, home-making and childcare. It also ensures that they can fulfill the current western practice of taxiing their children to and from as many after-school activities as possible.

A key constraint for the mothers in this study was time. This '*temporal treadmill*' and the notion that they need to ensure, and be seen to ensure, their children's safety mitigated against their use of public transport. Services were described as infrequent, and inflexible, not fitting into busy schedules or geographical routines. Getting onto buses and trains, with toddlers and buggies, was described as being impossible. Time spent on public transport was depicted in terms of `wasted' time. Arriving on time was important, being late was unacceptable.

The car ensured that decisions could be made around the best child-care facility or school, regardless of distance and bus routes. For the mothers it was important to drive their children to school, so they got there safely (in Ireland an added concern would be that they do not arrive sodden wet). Cars were also seen to facilitate 'family time'. One mother spoke of how she and her children would sing together while travelling, or listen to children's stories. Another used car time to speak to her children, as it was the only time '*they couldn't get away*'!

Mothering was not seen as a collective exercise. Each mother had her own individual schedule and for this she needed her own car. Car-pooling was not seen as viable because it would be difficult to find people who matched each other's routine. Also, it was not possible if there were more than three children, as each would need their own car seat. The car was also seen as a means of combatting suburban isolation, and ensuring that mothers and their young children could go out and socialize. The car gave mothers a sense of independence and meant they did not have to rely on others to get around. It was noted that, without one, people would think you were '*poverty-stricken*'. I

In essence, the car was seen as a means to an end, and the end in this case was good mothering.

FLYING

Flying is known to be an unsustainable practice and an important contributor to greenhouse emissions. While the airline industry may be working to reduce its impact through efficiencies and fuel blends, these may prove to be useless in the face of ever increasing passenger and flight numbers. For anyone who is concerned about their personal contribution to climate change, cutting back on air travel would appear, on face value, to be an obvious choice. However, many otherwise climate friendly consumers still continue to fly.

The public is caught between two narratives – flying is good for tourism and jobs (both at home and abroad), for personal development (experiencing and learning from different cultures), and for stress reduction (holidays). It facilitates ethical tourism and contributes to the well-being of local hard-hit communities. Yet flying contributes to climate change, which, in itself, will impact negatively on people's lives.

Governments, while trying to take a 'balanced' approach, are, again, giving mixed messages. They acknowledge the importance of air travel and the air industry to the national economy, yet they are also clearly aware of the negative environmental impacts. So, on the one hand, there are plans to grow the industry, to develop new airports and add new runways, while, on the other, people are being asked to avoid unnecessary flying. The decision has been handed down to the consumer (McDonald et al., 2015).

Research Study 1

Qualitative research in the UK (McDonald et al., 2015), looked at why twenty nine self-selected green-consumers continue to fly. It was concluded that the participants had two overarching strategies for repairing the dissonance experienced: they changed their behaviour, or they justified why they could not change their behaviour.

Justifications for not availing of other options included the cost, length of journey (the most common reason), comfort and convenience. Reasons were given for choosing to fly, such as wanting to visit family or friends or going on family trips, personal commitments (such as weddings) and work commitments (conferences and meetings). Decisions were made '*for the greater good'* or because there was no choice. Travel was seen as being important to personal and social identity in that it was good to be '*well-travelled'*, and to experience different cultures and visit interesting destinations.

While a small number of respondents had decided to cut out flying altogether, others said they had reduced the number of flights taken. This was seen as a temporary, interim, measure, as '*working towards their goals*', as '*flying less'*, and '*doing their best'*. Some participants had changed other aspects of their lives (as a trade) in order to make up for continuing to fly. The majority of the participants had not considered cutting out long haul flights. Neither did they entertain the possibility of changing travel destinations so they would not have to fly. There appeared to be no alternatives. Carbon offsetting was discussed, and some cynicism was expressed, but none of the participants had actually tried it.

The data demonstrates that even the most committed eco-consumers are still 'locked-in' to flying and this reflects the fact that it is still more 'normal' to fly than to avoid flying on environmental grounds. For this to change the authors suggest that a shift in social norms is required whereby the notion of being

'well-travelled' moves from quantity (number of places visited), to quality (low social and environmental impact). They note that there is an emerging respect for those who choose 'slow travel', and 'staycations', whereby choosing not to fly is reframed as a positive decision.

Research Study 2
Research carried out in 2008 (Hares et al., 2010), investigating the role that climate change plays in the holiday and travel decisions of UK tourists, centred on four focus group - students, parents with young children, working professionals, and relatively affluent retirees.

The overall findings suggest that most tourists do not think about climate change when organizing their holidays. Across the four groups, more than thirty different issues were cited as having a bearing on holiday planning decisions. Even though climate change was clearly on the research agenda, not one of the participants mentioned it as being a factor in their decision making. When asked, all but two of the participants admitted they did not consider climate change at all, even though the connection between flying and emissions had been widely acknowledged earlier in the focus groups. A number of the younger contributors went further and stated that climate change was encouraging them to fly more, while flights are cheap, as they believed that flying will become more restricted in the future.

Participants felt that there were no viable alternative travel options. Trains were too slow and costly. They praised low-cost airlines, who they saw as bringing overseas holidays to the masses, which has allowed the practice of going on holidays to become routine, a right to which participants felt they were entitled. No one supported the idea of imposing restrictions on the number of flights taken, citing the loss of their freedom. The notion of higher carbon taxes was also disapproved of, but was seen less negatively than quotas, particularly by those who could afford to pay them and still continue flying.

Carbon offsetting schemes were seen as handing the problem to individuals rather than the airlines. There was a general sense that the responsibility lies elsewhere – the major contributors to climate change were seen to be governments, industry and other countries, with little responsibility falling on individuals. There was a common view that '*governments should practice what they preach*'. Politicians should be leading by example. There was skepticism about how serious the UK government really was about combatting climate change, particularly as they were seen to be encouraging airport expansions. There was also a sense that big business was not doing its fair share and instead was handing the responsibility down to individual consumers.

''*If we don't fly somebody else will*" Male 7, Retired Group

''*As an individual we can do nothing, it doesn't come on the Richter Scale, never... I mean there's a thousand million in India and more than one and a half thousand million in China, we don't make a mark*" Male 9, Retired Group

Participants in this study reported high levels of recycling.

Research Study 3
The 'flyers' dilemma' (Higham et al., 2014) describes the tension between the personal benefits of travel and tourism, and the negative environmental impact of flying. Higham and colleagues conducted research across three European countries – Norway, UK and Germany - which demonstrates that there continues to be a '*profound reluctance to compromise'* when it comes to flying. However, they found cultural difference in the extent to which people were aware of the 'flyers dilemma'. There was

evidence in the cases of Norway and Germany of '*acute awareness of the link between personal air travel and global climate change, and deeply-held consumer concerns*'. In sharp contrast, the '*flickerings*' were barely evident in a number of the UK interviews.

According to the researchers, denial was particularly obvious in the UK interviews where general ignorance remained a convenient excuse, and a barrier to change. UK participants also expressed feeling 'locked-in' and they felt that the focus on individuals was useless. Resistance to change also arose from the view that access to regular holidays is a right for all. Feelings of guilt and calls for government intervention were commonly expressed in the Norwegian interviews. German participants, discounted the 'flyers' dilemma' on the grounds of rational decision making, particularly relating to cost and convenience, and they called for infrastructure and technology investment to provide sustainable alternatives to air travel. There did appear to be a 'hardening' of views towards cheap short haul flying practices, which the authors felt might be a sign that people are moving towards addressing the 'flyers' dilemma'.

The study concluded that air travel behaviors are established and deeply embedded social practices which have been '*historically-shaped*', and they are particularly appealing to younger people. Many seem to be '*waiting for a trigger*' to initiate behaviour change. Whether this trigger would come from government intervention, tourism management, evolving social change or climate related catastrophes, the authors felt, requires further investigation.

EATING RED MEAT

The energy intensive and unsustainable practice of producing and eating red meat has been identified as one of the key issues that could be addressed in an effort to curb climate change.

This is nowhere more relevant than in Ireland where over a third of our greenhouse emissions comes from the agriculture sector – a sector that is increasingly reliant on the rearing of cattle for meat and dairy production. However, the agriculture industry is a critical component of the Irish economy, and efforts are being made to decrease the negative impacts of cattle farming. It is also claimed, with some justification, that the Irish grass-based practice of raising cattle is more sustainable than intensive feedlot systems common elsewhere, and that, if production stopped here, the demand would only be met by other countries with less climate friendly methods.

It is a sensitive subject. In 2016, former Irish President, Mary Robinson, invoked the ire of the Irish farming lobby when, addressing young leaders at the One Young World Summit in Canada, she said: "*We need each of us to think about our carbon footprint. Eat less meat, or no meat at all. Become vegetarian or vegan*." The President of the Irish Creamery and Milk Suppliers Association quickly responded, accusing her of '*facile sensationalism*' which '*might reinforce dietary problems amongst specific groups like, for instance, teenage girls*' (IrishTimes, 2016)

Nevertheless, it would seem prudent to keep the question of how to wean people off such a meat-rich diet firmly on the table.

Research Study 1

Behavioural food scientist, Brian Wansink, has looked at the wealth of research (Wansink, 2002) carried out by The Committee on Food Habits, established by the US government during World War 2 to encourage the consumption of meat organs, in an effort to boost protein intake amongst the

depression-era population. To determine how such a dietary change could be achieved, the Department of Defense enlisted the services of the best of America's psychologists, sociologists, anthropologists, food scientists and home economists, including Kurt Lewin, and Margaret Mead.

Whereas, at the time, most promotional efforts to change eating habits focused on nutritional benefits, patriotism, guilt or duty, Kurt Lewin felt the initial focus should identify the barriers which prevented people from eating meat organs in the first place. Once these hurdles were addressed, he believed that habits around preparation and serving could be changed. The research team agreed that for someone to accept a food, it must be chosen, available, and familiar. It should look, taste and feel as expected. The group also focused on the wider issues of social norms, perceptions of taste, and the need for variety, all of which affect food related behaviour. They concluded that food preparation and serving methods can influence the acceptability of unfamiliar, even unpopular, food items. People are more likely to adapt to new foods if they look similar and are prepared and served in ways akin to prior experience. For instance, taste was influenced when the organ meats were packaged and presented in similar ways to ordinary meat. Acceptability was more likely if the organs didn't look different – such as in ground meat and sausages, and if they were served alongside other familiar foods.

The organ meats were introduced slowly so that it was initially seen as something novel, and not as a long-term substitute. Introducing different variety meats into occasional meals allowed for gradual acclimation. While people refused to make major changes to their eating habits, they were more amenable to including organ meats into their weekly diet. The all-or-nothing approach was found to be less effective than encouraging a more moderate and gradual shift. As the war continued, restricted meat (pork, beef and lamb) became less available at the butcher's counter and the quantity and visibility of organ meats increased. This stimulated perceptions of social acceptability.

It was discovered by the researchers that people distinguish between 'food for us' and what they saw as food for others. Similarly, people's food choices are influenced by the food that is being eaten by the groups with which they have strong emotional ties (families, close friends, peer/social groups), rather than by outsiders. Examples set by role models, often parents, were also very important.

The acceptance of organ meats was greatly facilitated by the government's public reinforcement of the new practice, through rationing and advertising messages. The consumption of these novel meats was seen as a way of showing support for the war effort. Not to do so, or to complain would have shown disregard for the greater suffering of others. However, it has to be noted that the new social norm around organ meats was fragile and was reversed once the war ended.

Research Study 2

In 2010, an internet survey in the Netherlands (Schösler et al., 2012) asked 1083 consumers questions about their consumption of meat and meat substitutes, portion sizes, and the motives behind their food choices. Photographs depicting a variety of meat-free meals were presented to the respondents, and rated in terms of appeal and whether they would be prepared at home. The results show that a lack of familiarity and cooking skills is hindering the preparation of vegetarian meals at home.

The authors point out the difference between '*ideological vegetarians*' and the '*more pragmatic users of meat substitutes*' and they propose that most people will need to become used to trying new meal styles, new ways of cooking, and experimenting with unfamiliar ingredients. Therefore, an incremental shift towards more *health-conscious* vegetarian meals would be more appealing. People could be encouraged initially towards fish, eggs and cheese, and from there to more plant-based diets. Meat

substitutes can be marketed as healthy options, and be easily substituted for a piece of meat in a regular meal. Substitution could become compatible with modern convenience culture, combining unfamiliar ingredients with familiar. For instance, non-meat alternatives could be added to pizzas or pies. In the survey, processed insect protein was relatively acceptable if added as an ingredient in a known food like a pizza. The notion of serving the whole insect caused revulsion. People should also be encouraged to eat a smaller portion of meat in each meal. Study participants who felt this was appealing were also more likely to say they would cut back on how many times they eat meat each week.

While the research showed that the cultural preference in the Netherlands is still to eat meat over vegetarian alternatives, it also showed that younger respondents have already made a shift to new eating habits, for instance, preferring to eat chicken, sausages and ground meat, instead of the traditional cutlet.

Research Study 3
Another paper based on the same research (De Boer et al., 2013) addressed the relationship between eating meat and climate change. The results showed that eating less meat is a largely '*under-explored*' route for mitigating climate change. 1.2% of the participants were vegetarian. A large proportion of the other respondents said they would '*maybe*' choose a meatless meal, indicating that they have not really thought too much about it.

The research findings also indicate that people's choices around food and the environment can be better understood when linked with their underlying values and motivations. Meat free meals were more acceptable to people who valued nature and they were viewed more negatively by people who were sceptical about climate change. Interestingly, they were not seen more positively by people who were concerned about climate change. The authors therefore warned that the meat-free meal idea could prove to be counter-productive if linked specifically to climate change. Instead, they recommend that an approach be taken which focuses on other values including those around health and the appreciation of nature. '*Taking into account how social forces influence motivation, a positive contribution may be expected from addressing contextual factors so that a meal without meat may become a more socially valued alternative'*.

SECTION 5: DISCUSSION

THEMES ARISING FROM THE RESEARCH

It's Not Easy Being Green
Many of the activities and practices that need to be changed are hard to shift because they are embedded in people's lifestyles and in their daily routines. They reflect how people see themselves, and how they want to be seen by others. They can be driven by a desire to keep up with the Jones, to follow fashion, and to meet social expectations. Practices, like showering and washing clothes, are determined by culture and evolving norms around what it means to be 'clean'. Actions like going to the toilet, can be motivated by emotion, desire, sensory perception and fear.
There are a myriad of actions that a consumer can take to lower their carbon footprint, but in a world defined by marketing and brands, where people are juggling time and commitments, it is very hard to identify those that matter. It does not necessarily follow that a person who is concerned about climate

change will have a low carbon footprint, or that income or education will have a bearing on whether households are pro-environmentally active.
More mainstream activities like recycling can crowd out other actions, as those who recycle may feel they are already 'doing their bit'. More entrenched activities like showering, driving, flying and eating meat are often seen as being non-negotiable. Cars are not only seen as practical ways of getting from A to B. They are also vehicles for self-expression, image and status, and offer freedom, comfort, peace and quiet, a sense of space from outside stress and danger, and quality time with the children. Some people enjoy the feel of driving. For others it's a sign of 'good mothering'.
People feel 'locked in' to flying as they need to visit family or friends or go on family trips, and fulfill personal commitments, such as weddings, and work commitments, conferences and meetings, and there are no viable alternatives. Young people may feel that climate change is encouraging them to fly more, while flights are cheap, as they believe that flying will become more restricted in the future

Rational Choice Thinking
The rational choice model assumes that the individual will make choices based on their own self-interest. It presumes that the individual is in control of how they act, regardless of what is going on around them. Such thinking leads policy makers and campaigners to seek to inform and educate, on the understanding that if you provide individuals with the knowledge, then their beliefs, attitudes, and intentions will change, and the appropriate action will follow.
It is now more widely accepted that what many people think they will do, say they will do, and then actually do, may differ substantially. There is increasing research interest in the 'value-action gap', whereby some people seem to act in opposition to values they hold dear, and the 'energy efficiency gap', whereby they do not take steps to make their homes more energy efficient, even though to do so will save money in the long run.

Social Practice, Norms and Routine
Focusing on individual behaviour marginalizes, and often excludes, other veins of thought, especially those around theories of social practice and transition.
Practices are what people do to achieve a shared goal and outcome. They are tied up with lifestyle, norms, habits, routine and social expectations. In essence, individuals can be seen as carriers of practice, almost as if the actions are outside of their control.
To fully understand social change in the context of climate change and the energy transition, we need to examine and understand how practices emerge and evolve, and to look at who are the drivers, the carriers and why they are carrying. For climate action to become mainstream, new ways of living, working and socializing will have to emerge.

Role of Governments, Institutions, Industry and Business
Focusing on the individual and the consumer deflects attention away from institutions and the part they play in defining which actions are easier, and more likely, than others. People want to see government and businesses leading by example. Citizens feel defensive and frustrated when responsibility and blame appears to be laid on their shoulders, and they are being given mixed messages from people in power.
A focus on green consumption immediately hits up against the industrial capitalist complex, and the importance of continuous economic growth, fueled by consumerism. An obvious policy conflict exists if one arm of government is encouraging lifestyle changes which threaten the jobs and livelihoods of many of their citizens – the very people who are being encouraged to go green.

The 'Low Hanging Fruit'

On the surface, retrofitting and upgrading the home appears to be a win-win situation – the government offers grants or Green Deals to speed up the process, and gets energy savings in return. The householder makes an initial investment which is repaid over time through reduced energy bills, and comfort levels increase in the home. However, the rate of take-up so far indicates that the situation is more complex than it looks.

Barriers include lack of finance, more pressing ways in which to spend the money, unwillingness to tamper with a heritage house, lack of trust in builders, stage of life, starting a family, elderly dependents in the home, school holidays, the perceived enormity of the task, the effect of regulation on the house, lack of consensus within family, the fear of possible disruption, the need to fit around other events, lack of or contradictory information, weather, the possibility of moving in the future, and inertia.

Interaction with New Technologies

While people can be encouraged to install new technologies, such as solar thermal panels, which appeal to their sense of 'environmental citizenship', they may not understand how they work or how they are affected by daily washing routines. Householders may not manage their systems effectively, and they may be reluctant to change their practices, and so make little or no energy savings. Poor installation can also be a problem.

Feedback from in-home energy monitors will be seen through the historical, cultural, social and practical lens of the consumer, and may have little effect on what are seen as non-negotiable actions. Those most concerned about energy prices, and those in fuel poverty, are less likely to accept demand side management tools into their homes, and they show a reluctance to share their energy data. Other householder concerns include: loss of control and the 'dumbing down of people', apathy, reliability, the view that the technology is divisive, exclusive or irrelevant, concerns over privacy and data security, higher maintenance costs, and trust.

The data from the monitors can be the cause of contentious and difficult household disputes. Older children are particularly reluctant to engage. Certain appliances, regardless of their energy use, are seen as being essential and cannot be done without. While for many people the monitors show the importance of buying energy efficient appliances, it is rare for them to use the information as a trigger to plan new energy saving routines or practices.

There can be resistance to the information provided as householders become defensive, feeling that there is only so much they should be expected to do, in the absence of market, policy and institutional support. After an initial period of enthusiasm, over time, the device slips into the background as households reach acceptance of a 'normal' level of energy use.

Mixed Messages

People are receiving mixed messages around energy and carbon intensive practices, like driving and flying. As one wing of government exhorts people to drive less and to use public transport, another funds new motorways, cuts funding for public transport, and looks to car sales to determine the buoyancy of the economy. While advances in engineering have improved the efficiency of car engines, at the same time, the size of vehicles has increased substantially, partly due to the shift to 'crossovers' and SUVs, and also the need for more boot space.

The public is caught between two narratives around flying – it is good for tourism and jobs (both at home and abroad), for personal development (experiencing and learning from different cultures), and for stress reduction (holidays). It facilitates ethical tourism and contributes to the well-being of local hard-hit communities. Yet, flying contributes to climate change, which, in itself, will impact negatively on people's lives. Governments acknowledge the importance of air travel and the air industry to the national economy, yet they are also clearly aware of the negative environmental impacts. So, on the one

hand, there are plans to grow the industry, to develop new airports and add new runways, while, on the other, people are being asked to avoid unnecessary flying.
The decision has been handed down to the consumer.

The Low Cost Hypothesis
The low cost hypothesis (Diekmann and Preisendörfer, 2003) predicts that the impact that an environmentally concerned attitude has on a person's behaviour will diminish as the behavioural costs of the required change increase. If the behavioural change is seen as being easy, people are more likely to transform their attitudes into the corresponding behaviour. If it is perceived to be difficult and inconvenient environmental attitudes will not be enough to change their current behaviour. Recycling and shopping behaviours are seen as being typically low-cost domains, and energy and mobility behaviour as high-cost.
Additionally, Diekmann and Preisendörfer propose that the defensive denial hypothesis predicts that under high behavioural cost conditions, people who are very concerned about an issue such as climate change will find ways to explain why it is acceptable and understandable for them not to act. In order to avoid cognitive dissonance and to maintain their self-esteem, they need to plausibly account for their inaction, which may mean downgrading the environmental impact. This may explain why so many studies show that people clearly link environmental concerns with recycling and avoiding certain products, but not with driving or flying.

POLICY SUGGESTIONS

Introduce a Clear Narrative
People are receiving mixed messages about what to do. There are many contradictions, including the clash between consumerism and economic growth, on the one hand, and using less energy/resources and shopping sustainably, on the other. People are confused when opposing messages come from different government departments, and business and industry stakeholders. All this at a time when trust levels in politicians, government, the media, and academia are steadily eroding.
Therefore, a clear narrative around climate action needs to be created, voiced and heard. Who voices such a narrative is key.

Use Appropriate Frames
As Lakoff (Lakoff, 2004) suggests, "*the facts bounce off*", so, for most people, information on its own will not work. People think in 'frames' and, to be accepted, the truth must fit into their frame.
In today's western society, environmental themes and notions of 'cutting back', 'living lightly' and 'doing without' will not inspire many people. Neither will negative and pessimistic messages - 'climate porn' (Retallack, 2006) – as they can make the issue appear improbable, unreal and remote, and can lead to fear, apathy, denial, and climate 'settlerdom', whereby the alarmist message is derided and rejected (Ereaut and Segnit, 2006). An apocalyptic view of the future can immobilize people and leave them feeling hopeless and powerless – 'what difference can I make?
Alternatives frames should be used where appropriate, for example - comfort, health, waste reduction, de-cluttering/downsizing/minimalizing, happiness/stress reduction/mindfulness, together/community/family, trust/empathy, and vision/hope/change for the better.

Lead by Example
People want to know that they are not being landed with all the responsibility, and that governments, politicians, industry and businesses are also making the shift.

Therefore, changes being made by those in leadership roles should be visible, credible and on-going. People also want to know that their actions will make a difference, and they do not want to act alone. They feel helpless when faced with the enormity of the task, so need to know that they are part of a bigger picture – this requires leadership, direction, and the sense of a movement - 'we're all in this together'
Who leads the movement is key.

Shift the Focus from Individuals
The policy focus needs to shift from individuals and their actions, to the context in which the actions take place. It needs to examine the role of practice, norms, habits, and routine, to understand who are the drivers, the carriers and why they are carrying, and to define appealing alternatives. But more sustainable ways of living, working and socializing will only take hold if they are not contradicted by messages from government, business, the media, and the marketing and advertising industries.

Support Community Based Initiatives
Working with people in community groups and neighbourhoods, or in co-operation with local agencies can help to dispel some of the barriers around renewable technologies, retrofitting and energy efficiency and sustainable behavioural change. The bottom up approach fosters trust, participation and social cohesion, and allows for the design and implementation of appropriate and relevant local strategies, which is particularly important in low-income areas. However, these initiatives need realistic levels of institutional and financial support, and on-going evaluation of the outcomes.

Make Actions Easier
Taking into account the low cost hypothesis which presumes that if the required behavioural change is seen as being doable, people are more likely to transform their attitudes into the corresponding behaviour, ways have to be found to make the required actions easier, and to provide infrastructural, institutional and practical supports on the ground.

Offer Energy Coaching
Current policy is geared towards only grant aiding the purchase and installation of new technologies, with the presumption that energy efficient results will automatically follow.
For people to accept new technologies and to learn to manage them effectively, particularly in relation to their routine practices, more consistent independent support is required, both pre-purchase and after installation, possibly in the form of trained local 'energy coaches'.

Mix the Familiar with the Unfamiliar
Bearing World War 2 efforts to encourage people to eat meat organs in mind, people will be more likely to accept a new food if it is chosen, available, and familiar. It should look, taste and feel as expected and be prepared and served in ways akin to prior experience. Unfamiliar ingredients are more acceptable if combined with those that are familiar. An incremental shift towards more *health-conscious* vegetarian meals would be more appealing than asking people to stop eating meat.

Be Mindful of the 'Silent Majority'
Bearing in mind Brexit, the Trump factor and the rise of populist support across Europe, any policy discussions around climate action, and behaviour change, should strive to be inclusive and also to appeal to people who are disaffected with the status quo. Climate change is seen as being part of the liberal agenda. Climate action needs to be far more widespread than that.

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