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# **“CHANGING HABITS OF A LIFETIME”: AN INVESTIGATION OF THE FACTORS THAT INFLUENCE BEHAVIOUR CHANGE TO REDUCE DOMESTIC ENERGY CONSUMPTION**

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Concerns about the impact of climate change are increasingly relevant and problematic to modern society. Since the establishment of the Climate Change Act in 2008, the UK is committed to reducing carbon dioxide emissions by at least 80%, by the year 2050, from 1990 levels. Improving the way in which energy is used in the domestic sector has the potential to play a major role in the achievement of this overall target. This exploratory study uses in-depth interviews and focus groups to investigate the values, motivations and routes to engagement of UK homeowners in adopting pro-environmental behavioural changes. The findings suggest that the greatest barriers homeowners feel prevent them from adopting a lower carbon lifestyle are issues related to a lack of money, time and a perception that their actions are insignificant. Typically, concern for the environment and future generations are drivers of environmentally beneficial behaviour. However, people are generally unaware of any relevant initiatives or schemes to aid them in becoming more energy efficient. The results suggest that people are generally energy conscious, but not energy knowledgeable. Therefore, there is an opportunity for effective

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communication to bridge this gap in inspiring collective change in reducing energy consumption through behaviour modification.

Keywords: Environment, Behaviour Change, Barriers, Motivation, Energy Use.

## **INTRODUCTION**

Addressing climate change is a challenging prospect, not least because any attempt at having an effective response depends largely on modifying social practices (Shove, Pantzar & Watson 2012). As human populations continue to grow, the current drive towards reducing energy consumption and emissions, such as CO<sub>2</sub> and other greenhouse gases, has led to an increased focus on household energy efficiency and conservation behaviours. This implies that within the context of energy, a change in attitudes and behaviours is necessary (Owens & Driffill 2008) in accelerating a transition to a more sustainable lifestyle (Energy Saving Trust 2014).

The consumption of energy is a consequence of deeply ingrained behaviour that interlinks with many other features of a person's life, such as work and family. Domestic energy consumption is a complex issue, principally related to the physical attributes of a person's home, the energy systems (e.g. electrical appliances) which these homes contain, and the consumptive behaviour of the occupiers.

Improving the way in which energy is used is a measure that can be adopted by everyone in all aspects of their life. This research explores the mechanisms by which individuals can be provided with the means and motivation to reduce their energy consumption through behaviour modifications in a domestic environment. This study also aims to establish the form and type of information that both encourages and enables homeowners to adopt greater pro-environmental behaviour. It is important to understand not only attitudes toward the environment, but also the motives and values that form the basis for those attitudes. Examining both attitudes and associated motives can lead to a better understanding of environmentally related behaviours and new ideas about ways to encourage energy conservation in a domestic setting.

## RESEARCH METHOD

In order to evaluate the opportunities and constraints in encouraging environmentally beneficial behaviour amongst homeowners, four objectives were established;

1. To examine the energy saving practices of homeowners and the barriers that limit this behaviour;
2. To ascertain the primary motivators for existing pro-environmental behaviour amongst homeowners;
3. To evaluate the impact of local initiatives in promoting energy conservation;
4. To determine which methods of communication and incentives would be the most effective in encouraging energy conservation amongst homeowners.

The research project utilised methods that were designed to obtain qualitative data from two semi-structured interviews with professional practitioners, combined with data gathered from targeted focus groups. For the purpose of this research, it was determined that due to prior knowledge and experience of the researcher, homeowners living in Worcestershire was the most appropriate population to sample. This small-scale research intended to explore complex and subtle phenomena, as well as opinions and feelings. As such, this involved probing a relatively unexplored topic that focussed on the energy consumption of homeowners within Worcestershire; this also offered a route to the discovery of new ideas. Although the sample may not necessarily reflect the characteristics of the wider population, it does have some “semblance of representativeness, at least in terms of the qualitative diversity of the population being studied” (Veal, 2011:251). Permission was sought in advance from participants that focus group discussions would be recorded on video.

A purposive, convenience sampling approach was adopted for the practitioner interviews using professional contacts established during the researcher’s industrial work placement.

The findings from the interviews were used to support the accuracy and direction of the topics discussed within the focus groups. The incorporation of this form of data collection added clarity to the research project through the generation of relevant, real-time and professional thoughts and opinions. The interviews took place online through email correspondence.

There was an element of convenience sampling to gain initial engagement with the target population and snowball sampling was used to build the

number of participants for the focus groups. A total of nineteen participants were randomly divided into two groups of six and one group of seven.

In structuring the data analysis, the technique suggested by Miles and Huberman (1994) consisting of three key stages was adopted: data reduction; data display and conclusion drawing/verification.

## **LITERATURE REVIEW**

The 2008 Climate Change Act established the world's first legally binding climate change target, with an aim to reduce the UK's CO<sub>2</sub> emissions by at least 80% by 2050 - from the 1990 baseline (Great Britain, Climate Change Act 2008). As reported by the Department of Energy and Climate Change (DECC) (2014), 29% of final UK energy consumption is accounted for by the residential sector. Therefore, although there is no specified target reduction from this sector, reducing domestic emissions represents a major opportunity in the achievement of the overall target (Palmer and Cooper 2013). As such Schultz (2014:107) claims "environmental problems have their origins in human behaviour, and as a result, any solution to environmental issues will require changes in behaviour."

The Intergovernmental Panel on Climate Change (IPCC) assessment of the most current science on climate change stresses the urgent need for a societal response (Whitmarsh, O'Neill & Lorenzoni 2011). Thus, a significant contribution to reducing CO<sub>2</sub> emissions could be accomplished by encouraging consumers to reduce and adapt their patterns of energy use at home (Great Britain, Houses of Parliament 2012). The government recognises that if this target is to be successfully met, it is imperative that consumers' values and attitudes towards pro-environmental behaviour in home energy use are influenced into becoming more sustainable. Therefore, the focus of this study is private homeowners.

### *The 'Value-Action' Gap*

A common theme within the literature is the issue that very often an individual's values and beliefs do not translate to their associated actions or what may be seen as 'pro-environmental behaviour'. Blake (1999) refers to this as the 'value-action' gap which is a featured obstacle experienced by a large proportion of homeowners.

In order to better understand and explore the factors contributing to the 'value-action' gap, a range of theoretical frameworks has been developed. One of the oldest models of pro-environmental behaviour is the linear

progression model (See Figure 1), by Burgess, Harrison & Filius (1998, cited in Kollmuss & Agyeman 2002).



Figure 1: Early model of pro-environmental behaviour (Kollmuss & Agyeman 2002)

This assumes that there is a straightforward transition from better education and improved environmental knowledge, leading to greater environmental awareness and concern which automatically results in pro-environmental behaviour. These rationalist models have been referred to as (information) ‘deficit’ models (Kollmuss & Agyeman 2002). It could be argued that the most prominent flaw with this type of model is that it fails to recognise the constraints associated with the ‘value-action’ gap. Lucas *et al.* (2008) stress that there is not a clear correspondence between attitudes and behaviour, as it is a complex and non-linear relationship.

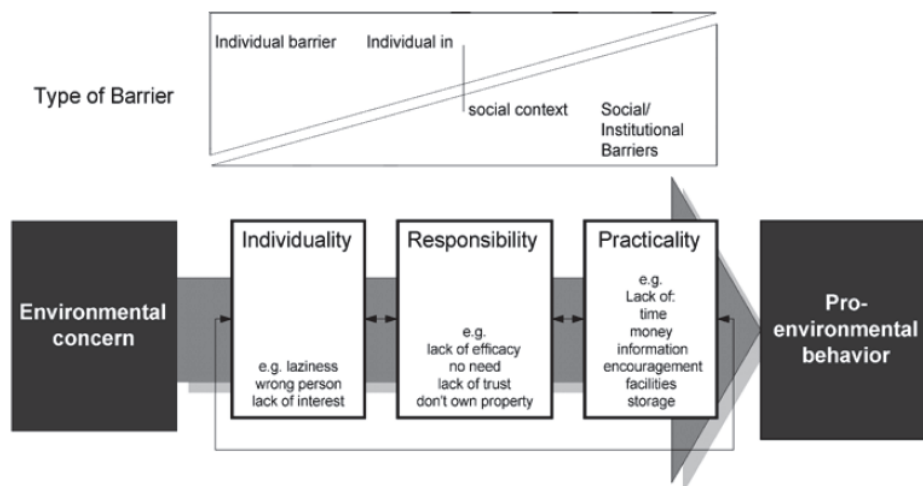


Figure 2: Barriers between environmental concern and action (Blake 1999)

Blake’s model (See Figure 2) emphasises the interconnected relationship among variables, identifying three barriers to actions - individuality,

responsibility and practicality. An investigation of the numerous theoretical frameworks developed to explain this gap revealed several barriers to pro-environmental change (Blake 1999; Bell *et al.* 2001; Flynn, Bellaby & Ricci 2009; Markle 2013 & Schultz 2014).

### **Barriers to Pro-Environmental Behaviour**

In addition to the barriers already discussed, there are many other factors that contribute to inaction. The Department for Environment, Food and Rural Affairs (DEFRA) (2008) identified a range of common barriers. The first were external, practical limits such as demands on time, shortage of money or difficult working patterns. The second was the view that changing behaviour would have an adverse effect upon lifestyle, for example, by affecting time or restricting freedoms – and, especially convenience. The third barrier was habitual behaviour – reluctance to spend time and effort on change. The fourth concerns self-image, lifestyle and a reluctance to appear to identify with a ‘green’ minority. This addresses the dominant social paradigm (DSP) which Emery (2012:39) refers to as the “collection of norms, beliefs, values, and the habits that form the most commonly held world view within a culture, which govern the way people do things.” Thus, establishing a society where sustainable behaviour is seen as the norm would propel consumers into embracing change for the ‘greater good’.

The fifth barrier was scepticism about climate change, mistrust of messages about climate change and disbelief about the individual’s role in contributing towards it. Finally, while the existence of climate change may not be disputed by some, the ability to effect change through individual actions was seen as ineffective, resulting in a feeling of disempowerment and apathy.

As stated by Great Britain, Cabinet Office (2011), people have a tendency to ‘discount the future’, suggesting that they would prefer a smaller reward today over a larger reward in the long run. This particularly acts as a barrier for homeowners, as undertaking energy efficiency measures often involves an associated initial cost that can be quite substantial. This rules out excluding the considerations related to the achievable energy savings in the future.

## **Motivators for Pro-Environmental Behaviour**

A common theme evident from the literature implies that if the right tools are used to address the barriers associated with pro-environmental change, these could be turned in to drivers of change. Tabi (2013:980) asserts:

“There are two approaches in the literature to reducing consumption and environmental load; voluntarism (increased awareness through campaigns, education-related drives and increasing their willingness to live an environmentally-friendly lifestyle) and structural (address living conditions and circumstance that lock consumers into living unsustainable lifestyles e.g. working conditions, size of homes, family size etc.”

As stated by Lucas (2008:456 adapted from DEFRA, 2006) “policy makers in the UK are beginning to reach a consensus about the need to develop policies that can have an active, significant and lasting impact on [pro-environmental] behaviours...”

This led to the establishment of various initiatives and schemes designed to offer financial incentives which aim to alleviate any potential disempowerment homeowners may have towards being able to obtain such energy saving measures. In this way, policy and technological change have the potential to impact significantly on improving the environment. However, individual commitment can make a difference too (Bell *et al.* 2001). Therefore, if current targets are to be met, a combination of the three - appropriate policy, technological change and individual commitment, is imperative and all of these require effective communication.

## **Encouraging Pro-Environmental Behaviour Change through Communication**

The United Nations Environment Programme (UNEP) and Futerra (2005:6) claim that “public awareness and concern about environmental and social issues is growing.” Flynn, Bellaby & Ricci (2009:162) agree, by acknowledging that “people express strong support for environmentally sustainable policies.” However, they also note that individuals lack commitment towards altering their own behaviour but if provided with the appropriate information, they will be more likely to adapt. This is backed by Bitchard & Thurairajah (2013) who assert that a great proportion of homeowners may be motivated to adopt a more sustainable lifestyle through a combination of relevant information, incentives and norm-based



influences. A study carried out by Mansouri, Newborough & Probert (1996) supports this notion as their findings revealed that the general public are both interested in receiving information about the impacts concerning household energy consumption and expressed a willingness to modify their behaviour.

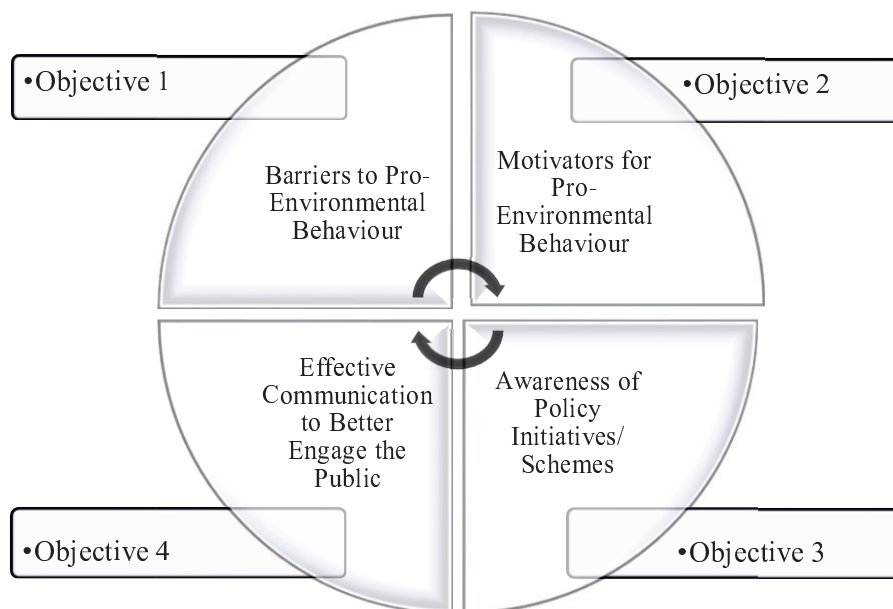
Research carried out by Pierce, Schiano & Paulos (2010) suggests that domestic energy-consuming interactions can be characterised as unconscious or habitual, (as opposed to rational decision-making). In light of this, Futerra (2011:4) suggests that:

“Once you’ve woken or ‘unfrozen’ people from their sleepwalking behaviour, you can convince them to change. But once they’ve adopted the new behaviours, you need to find a way of ‘refreezing’ them, so the positive behaviour becomes an unconscious habit again.”

In order to have the best chance to meet desired targets, sustainable development needs to be made approachable and understandable. One approach for integrating modified behaviour is the ‘3 Cs Principle’, in which Emery (2012:229) suggests “consumers are more likely to be persuaded to act by communications which are clear, credible and comparable with other sustainable claims.” This has the potential to encourage lasting societal change if coupled with UNEP and Futerra’s (2005) top three communications for successfully engaging the public. The first emphasises the importance of tightly defining target audiences. Hargreaves (2011) and Abrahamse *et al.* (2007) clarify this by stating that the most effective campaigns are those tailored to target audiences. It must also be ensured that the information source for public campaigns and energy advice is trusted (European Environment Agency 2013). The second tool for engagement is to be inspiring by using the drama associated with the challenge and the excitement that comes with the solutions. The third communication underlines the importance of translating complex messages into ones that are both relatable to the targeted audience and practical in stimulating a response. This is fundamental in moving the impacts associated with climate change into people’s ‘locus of control’. As Kollmuss & Agyeman (2002) and Futerra (2011) comment, unless people believe their altered behaviour will make a difference, it is unlikely that even financial incentives and efforts to increase environmental education would succeed in bringing about change. This is qualified by Barr (2006:50) who claims “those who feel that environmental action is likely to have an impact are more likely to act.”

The overall aim of this study is to identify to what extent the models and frameworks discussed may be applied in practice to bring about lasting pro-environmental changes in homeowners' behaviours which are critical to reducing domestic energy consumption. The study investigates strategies to motivate and support continuing reduction in energy usage and, in particular, the most effective communication tools. It is hoped that ultimately the findings of this study may in some small way contribute to the body of work seeking to reach the UK government's 2050 emissions target.

## RESULTS



*Figure 3: Diagram demonstrating the interrelatedness of the research objectives and research themes established from the findings (Source: Author)*

Figure 3 illustrates the interlinked relationship between the themes embedded within the research aims. The key research themes, barriers, motivators, awareness and communication are displayed as headings. Each theme formulates the direction of research and emphasises the interdependency of the themes in meeting the objectives of this study. Objectives 1 and 2 identify the barriers and motives which explain current behaviour. Objective 3 reflects the resources that may be drawn on to

support behaviour change and objective 4 represents the means of engaging the public in increased pro-environmental behaviour.

### Participants' Energy Saving Practices

At the beginning of each focus group, the participants were asked to rate their level of pro-environmental behaviour by using a scale of 1-5 (with 1 being not very much and 5 being the most). This was indicative of how much effort they considered they were putting into managing their energy use (Figure 4).

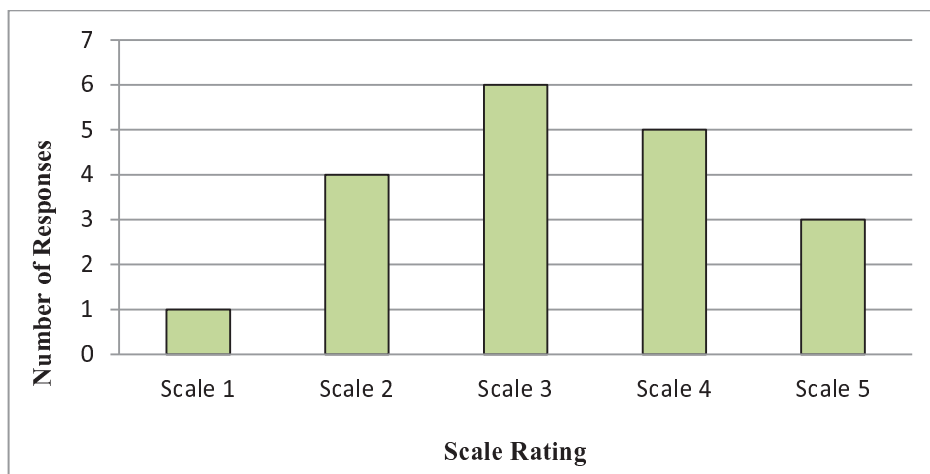


Figure 4: Level of pro-environmental behaviour involvement amongst the study participants (n=19)

Interestingly, two of the participants who were in the same group, rated themselves at opposite ends of the scale although they expressed very similar justifications. This being that their home encompassed a variety of energy saving measures, such as double glazed windows and loft/cavity wall insulation. Participant A from Group 1, who rated themselves as '1' explained that despite the adopted energy saving measures, "in terms of extra stuff we don't do it." (Group 1, Participant A). Conversely, because of the energy saving measures alone, participant F saw themselves as a '5', irrespective of the fact that they do not participate in any additional environmentally beneficial behaviour. This shows just how differently people in comparable situations can perceive themselves.

To establish a basic level of understanding for their environmentally beneficial practices; the participants were asked to state in which ways they try to save energy within their home.

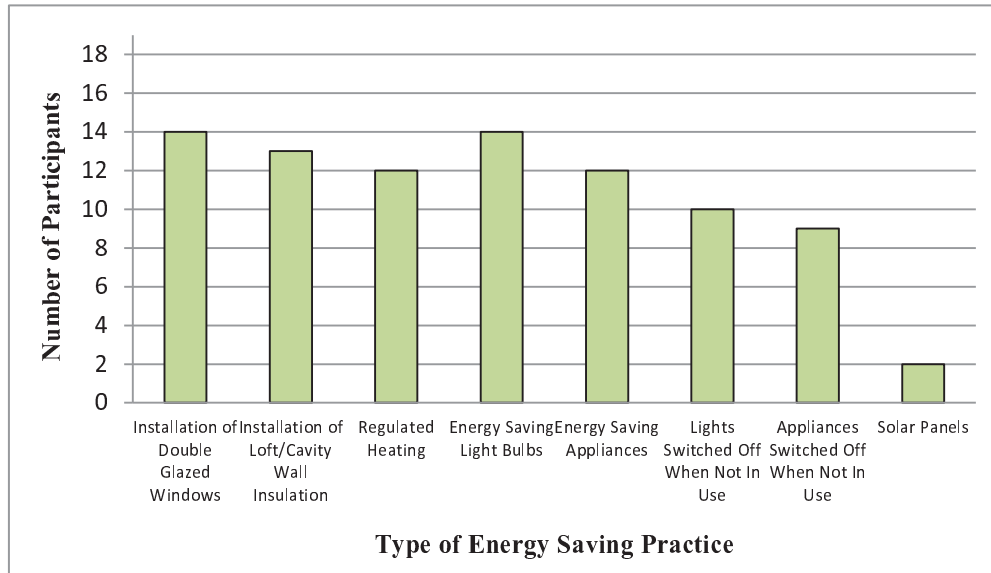


Figure 5: Participants' energy saving practices (n=19)

Many of the participants have benefited from the installation of energy efficient measures into their homes, such as improved loft and cavity wall insulation, double glazing and improvements to the energy efficiency of heating systems. Due to the adoption of such measures, one participant exclaimed that their “bills for energy have been halved over the last year and a half” (Group 1, Participant F).

### Barriers to Pro-Environmental Behaviour

In general, the results appeared to be consistent with the assumption that individuals experience a range of obstacles when it comes to participating in pro-environmental behaviours.

#### Cost

The most common barrier to reducing energy consumption was due to a finance related issue, labelled ‘cost’ during the coding process. Blake’s (1999) model categorises this as a ‘practicality’ barrier. Financial concerns were also referred to by both of the practitioners. The Community Energy and Resilience Project Manager recognised the influence money constraints can have on the effectiveness of their schemes, “the programmes are very much driven by the funding available to deliver them.” This reasserts the importance of initiatives being suitably funded in order to strengthen the success of achieving substantial energy reductions.

### *Time*

The dominance of time constraints being a barrier to environmentally beneficial behaviour was stressed by the majority of participants. One participant in particular expanded upon this:

“Mine is time, in the fact that I just can’t be bothered sometimes and that’s purely because of raising young children, the last thing you want to do is to check that everything is turned off. I think I would do it more if I didn’t have three young children.” (Group 3, Participant C).

### *Powerlessness*

A sub-theme which emerged from the findings and also falls under the ‘barriers’ category has been labelled just that, ‘powerlessness.’ In a similar vein, this has been referred to as ‘lack of efficacy’ in the literature by Blake (1999) and Barr (2006). Many of the participants expressed frustration, “I think my bit counts for nothing when you think about countries like China and America” (Group 2, Participant C), “we are such minor players” (Group 1, Participant B). This is an area distinguished within the literature, supported by Flynn, Bellaby & Ricci (2009) who reiterate that individuals may feel their actions to be insignificant in comparison to other impacts, such as industry.

The responses from participants when asked to clarify any other constraints that prevent them from saving energy, were shown to be ‘lack of awareness’, ‘attitude’, ‘convenience’ and ‘aesthetics’. It is well-known that households tend to primarily use energy for comfort and convenience. A participant from Group 1 clarified this by stating that:

“You live your life at a bit of a pace therefore you want your home to just work for you and I suppose a lot of what we do is purely about convenience and comfort. We’re not used to not being comfortable.” (Group 1, Participant C).

Roughly a quarter of participants revealed an aversion to embracing certain energy saving measures for reasons associated with aesthetics.

Consciousness of climate change issues among research participants did indeed appear high. However, as the literature and findings from this study suggest, there is a significant disconnect between the attitudes a participant possesses and any changes in behaviour. This notion reflects the studies carried out by Blake (1992), Kollmuss & Agyeman (2002), Barr (2006) and Lucas (2008) who assert this is particularly clear in relation to energy reduction.

It became apparent throughout the discussions that lack of knowledge regarding new technologies and behaviour strategies was a strong factor in preventing participants from saving energy. “We could do more to consciously save energy than we do at the minute, but I don’t know where we need to do it” (Group 2, Participant B). This suggests that if better informed, residents may be encouraged to alter their behaviour.

### **Motivators for Pro-Environmental Behaviour**

As the focus group discussions progressed, the participants described their reasons for reducing their energy consumption.

#### *Environmental Concern*

A large proportion of participants expressed their concern about the impacts inflicted upon the environment in association with homeowner energy consumption, referred to in the transcripts as ‘environmental concern’. In alleviating energy usage, the adoption of modified behaviour types requires a certain amount of conscious effort, at least until new habits have formed. The participants’ responses mirrored the findings from research by Stern (2000) and Steg (2008) who emphasise the link between a person’s environmental concern and their associated behaviours. However, the findings did reveal that although participants acknowledged their concern for the environment, this did not stimulate sustainable behaviour.

A minority of participants (2/16) who were particularly apathetic towards better managing their household energy seemed to be influenced by their views concerning climate change. A participant from Group 1 stated that climate change is a...

“Waste of time. A lot of the climate change information has been spun. You can’t believe anything that you read because you get one reasoned argument then you get a counter argument.” (Group 1, Participant A).

This correlates with DEFRA (2008) who acknowledge scepticism as a barrier for change.

#### *Intergenerational Equity*

When questioned about their motives towards reducing their individual energy consumption, many participants expressed concern for the threats that younger generations may have to face. This pattern was coded as ‘intergenerational equity’. One participant stated “I’m very conscious about the effect we might be having on future generations, it certainly

worries me.” (Group 2, Participant B). This view espouses optimism for long-lasting behaviour change. The theory offered within the work by Bedford *et al.* (2010) on home energy use promotes the idea that behaviour traditions are passed from one generation to another. In this way, if householders were to modify their current energy consumption behaviour, it is likely that these practices will be conveyed to later generations, thus ensuring the longevity of environmentally beneficial behaviours. The Sustainability Consultant referred to a project called ECO Communities which made use of school homework projects to collect basic energy data. Guidance was then offered to encourage and support householders in reducing their energy consumption. The Sustainability Consultant remarked upon “parents who had been incredibly motivated by the work they did through the projects – leading to a number of exciting new developments on family homes.” There is real potential for this to be replicated across similar communities with school aged children. For example, more than half of the study participants fell into this category. Approaches like this can also harness many young people’s natural enthusiasm and desires to engage in pro-environmental behaviour, thereby offering an opportunity to motivate parents to save energy.

#### *Feedback*

Measures that provide feedback have the potential to substantially raise energy awareness and change consumers’ attitudes in relation to consumption patterns; this is an example of a ‘reflective practice’ as termed by Pullinger, Lovell & Webb (2014). In this sense, when homeowners receive feedback about their efforts to reduce their energy use, they may, as a result of the positive consequences attached to their behaviour, be motivated to conserve more energy; Abrahamsme *et al.* (2005) support this. An increasingly popular form of instantaneous feedback of consumption patterns can be gained through the use of a Smart meter. This notion was discussed by participants and labelled ‘feedback’. A few of the participants believed “smart meters are quite useful - you can actually visually be told how much you’re using at a time.” (Group 1, Participant A). This real-time display encouraged several participants to conserve energy. For example, in relation to boiling the kettle, participants were careful to boil only the quantity of water that was needed instead of wasting energy through overfilling. Although these types of practices may be small, their cumulative effect has the potential to lead to noticeable energy savings.

## **Awareness of Policy Initiatives/Schemes – How Effective is Current Communication?**

According to the Sustainability Consultant, “there needs to be that sense of momentum and shared priority that extends through government and society and business”. At a domestic level, the government have launched a number of policies with the intent to empower householders to actively save energy.

### *Lack of Awareness*

To establish occupant awareness of such energy reduction schemes either at a national or local level, the residents involved in this study were asked to comment on their familiarity with any initiatives or schemes. The results were somewhat surprising, with there being a shared idea among almost all of the participants that they “haven’t heard of any, so if the council are offering schemes, it hasn’t reached us” (Group 3, Participant C). Mention of national policies was also invariably scarce.

### *Trust*

Throughout the literature, it became clear that public perceptions related to ‘trust’ highly influenced their willingness to participate in schemes to reduce their energy consumption. There was unanimity amongst the participants who articulated an aversion and scepticism towards propositions related to saving energy as they believed there to be a hidden agenda. The findings, however, revealed a higher level of trust towards the local authority, with participants saying that they would “like to think that the Councils in Worcestershire would have the residents’ best interests at heart” (Group 3, Participant G). This supports the opinion of the Sustainability Consultant who stated:

“People power is where things will change...but those grass roots movements also need the involvement of local / national and international bodies/governments etc”.

Thus, for the public to even consider the possibility of modifying their behaviour in an effort to reduce their energy consumption patterns, a foundation of trust is fundamentally important.

### *Social Norm*

The findings reveal that with regard to those involved in this study, a sense of ‘virtue ethics’ is a more prominent driver than consequentialism to behaving in a more pro-environmental manner. In this way, participants were more concerned about maintaining their moral character rather



judging the rightness or wrongness of their individual actions by the associated outcome itself. In order to promote and achieve energy-conscious behaviour, it is necessary to encourage a shift in what are referred to as social pressures (Kollmuss & Agyeman 2002). A participant from Group 2 included “nobody criticises you for using too much or too little, you don’t get penalised, you don’t get embarrassed, you don’t get shown up.” (Group 2, Participant A). In this sense, it seems possible to stimulate a change in mentality by projecting behaviours into society in the hope that they might eventually be adopted as the new ‘norm’. A participant from Group 2 supports this notion, “it would just become habit so wouldn’t seem like an out of the ordinary thing to do.” (Group 2, Participant B). A participant from Group 3 added, “I would probably change my behaviour, but then I’m a rule follower.” (Group 3, Participant B). Another participant from Group 3 exclaimed “it is interesting that efforts to alter behaviour are essentially an attempt at changing habits of a lifetime.” (Group 3, Participant F). Stern (2000) and Emery (2012) reiterate this concept, claiming that the general predisposition attached to social norms heavily influences a variety of behaviours. Facilitating the introduction of pro-environmental behaviours has the opportunity to alter what is seen as the social norm. With this, there is the potential for long-term behaviour change to occur. The transformation of collective conventions through reinforcing positive change is fundamental to locking people into consumption patterns with improved outcomes for resource consumption and the environment.

## **Effective Communication to Better Engage the Public**

### *Community*

An interesting and somewhat unexpected aspiration amongst many of the participants was the desire to affirm a sense of belonging and identity within the community. This theme was labelled ‘community’ and seems to indicate that the participants’ lack of trust in governance on a national scale is not shadowed at a local level. Residents were keen to demonstrate that “we do what we can to benefit ourselves but it is also nice to feel like you’re helping the local authority in some way” (Group 2, Participant F).

It is essential, therefore, to develop a more collaborative relationship between homeowners and the local councils to ensure a more positive response to environmentally beneficial initiatives.

### *Communication Deficit*

The research indicates that homeowners are interested in receiving information concerning household energy use and the associated

environmental impact, and that if provided with the right means, are willing to modify their behaviour to reduce their usage and consequential environmental damage. This supports the findings revealed by Mansouri, Newborough & Probert (1996). A participant from Group 3 clarifies this by adding “I think getting information to me that is relevant to me in the place that I live, making it local, making it easy, making it quick. That’s what’s important.” (Group 3, Participant C). This is also supported by Hargreaves (2011) and Abrahamse *et al.* (2007) who emphasise the importance tailored information has on encouraging public approval.

#### *Communication Tools*

A final, overarching theme was coded as ‘communication tools’. This links the other three dominant themes; as barriers have the potential to be turned into motivators by encouraging approval of policy initiatives and behaviour modification through effective communication.

When asked to state which form of communication would be most effective in influencing residents to save energy, a high proportion of participants saw email, social media and leaflets as being the most popular. Establishing which forms of communication are accepted by the target audience is crucial in ensuring that limited resources are being used efficiently. Moreover, participants stated that they would like the information to be from a local source, which further embeds their community trust. A participant from Group 1 said “if the council directly emailed me, I’d read it.” (Group 1, Participant A). Another participant, from Group 3, chose social media and explained that they “would probably join a group that was related to Worcester – ‘this is Worcester’ or something like that.” (Group 3, Participant E).

A perception concurrent across the study was the impact ‘word of mouth’ has on the uptake of energy saving strategies. A participant from Group 2 said that “if a neighbour had something done and they told me about it, then I would look into it.” (Group 2, Participant F). The Community Energy and Resilience Project Manager acknowledges this, “seeing the work being completed on another property is also key.”

## **Summary of Discussion of Results and Analysis**

The previous section identified the main responses which emerged from participants on the following themes:

- barriers to pro-environmental behaviour
- motivators for pro-environmental behaviour
- awareness of policy initiatives/schemes, and
- effective communication to better engage the public’.

The themes are interrelated (as shown in Figure 4). They encompass elements which help to explain the findings of the research and also correlate with the research objectives.

New findings have been identified, some, for example, which are associated with the participants’ needs to feel that they remain an integral part of the community and to reinforce their connections with the local authority.

## **CONCLUSIONS**

This project has examined homeowners’ approaches to energy consumption and conservation. It did so by identifying the most successful means of engaging homeowners in reduction of energy consumption through behaviour modifications.

In examining the energy saving practices of homeowners and the barriers that limit this behaviour, this research revealed that all participants incorporated some energy saving practices into their daily lives. However, and despite reflecting UNEP and Futerra’s (2005) recognition of increased awareness of environmental and energy issues, this research shows that this is not translated into more sustainable energy behaviours in the home, demonstrating the ‘value-action gap’ concept.

The most common barriers preventing participants from saving energy were shown to be ‘cost’, ‘time’ and ‘powerlessness’. For some, at least, it may be that scepticism over climate change offers an excuse not to act. Effective communications are critical in breaking down these barriers. Unless there is greater appreciation of the interconnectedness between all societal components it will become increasingly difficult to inspire sustainable collective change in reducing energy consumption.

Prior to the group discussions, participants generally felt disengaged and somewhat unaware that their habitual daily routine led to behaviours that avoidably consumed energy. However, feedback following focus group

discussions revealed that the vast majority of the participants had been encouraged to improve their behaviour and seek solutions with their newly acquired knowledge.

Participants were unaware of relevant schemes put in place at either a local or national level. This research also highlighted the importance of 'trust' and 'social norms' in influencing homeowner acceptance and the success of governmental schemes.

The results show that many of the participants are energy conscious, but not energy knowledgeable. They are aware of the importance of low energy use, but are insufficiently motivated to carry out energy-saving measures in their homes. For this reason, it is of great importance that the efficiency of communication with local residents is prioritised. In order for the public to be empowered and engaged in addressing their energy consumptive patterns, they need to be provided with insightful and targeted information. This research suggests that this information would best be facilitated through the use of direct 'emails' from a trusted source (e.g. the local authority), 'social media' in some form of a group with a community focus, and 'leaflets' that were informative and relevant to the occupier. This group of residents took pride in the City of Worcester and were keen to support the work of the local authority.

Improving channels of communication could promote greater collaboration and strengthen connections between the residents and the local authority. It could also improve links between residents. Collectively, this would significantly increase the impact of positive energy saving and other supportive pro-environmental behaviours.

In order to engage consumers in the process of translating barriers into motivators, the research findings underline the desire for, and importance of, meaningful and clear communication and ongoing feedback as the main tools in strategies to promote well-informed and long-lasting changes in behaviour in the context of a threatened environment.

## **REFERENCES**

- ABRAHAMSE, Wokje., *et al.* (2005). A review of intervention studies aimed at household energy conservation. [online]. *Environmental Psychology*, 25 (3) 273-291.
- ABRAHAMSE, Wokje., *et al.* (2007). The effect of tailored information, goal setting, and tailored feedback on household energy use, energy-related behaviours, and behavioural antecedents. [online]. *Environmental Psychology*, 27 (4) 265-276.

- BARR, Stewart (2006). Environmental Action in the Home: Investigating the 'Value-Action' Gap. [online]. *Geography*, 91 (1), 43-54.
- BEDFORD, T., *et al.* (2010). Motivations for Pro-environmental Behaviour: A research report completed for the Department for Environment, Food and Rural Affairs. RESOLVE. [online]. London, DEFRA.  
<http://scienceresearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=15628>
- BELL, A. Paul., *et al.* (2001). *Environmental Psychology*. 5th ed., London, Wadsworth.
- BITCHARD, Erik and THURAIRAJAH, Nirooja (2013). Behaviour change strategies for energy efficiency in owner-occupied housing. [online]. *Construction Innovation*, 13 (2) 165-185.
- BLAKE, James (1999). Overcoming the 'value- action gap' in environmental policy: Tensions between national policy and local experience. [online]. *Local Environment*, 4 (3) 257-278.
- DEPARTMENT OF ENERGY AND CLIMATE CHANGE (2014). Energy Consumption in the UK (2014) – Chapter 1: Overall energy consumption in the UK since 1970. [online]. London, DECC. URN 14D/208.  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/337452/ecuk\\_chapter\\_1\\_overall\\_factsheet.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/337452/ecuk_chapter_1_overall_factsheet.pdf)
- DEPARTMENT FOR ENVIRONMENT, FOOD AND RURAL AFFAIRS (2008). A Framework for Pro-Environmental Behaviours. [online]. London, DEFRA.  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/69277/pb13574-behaviours-report-080110.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69277/pb13574-behaviours-report-080110.pdf)
- EMERY, Barry (2012). *Sustainable Marketing*. Harlow , Pearson.
- ENERGY SAVING TRUST (2014). Who we are: About us. [online].  
<http://www.energysavingtrust.org.uk/corporate/about-us>
- EUROPEAN ENVIRONMENT AGENCY (2013). Achieving energy efficiency through behaviour change: what does it take? [online]. EEA Technical Report no. 5.  
<http://www.eea.europa.eu/publications/achieving-energy-efficiency-through-behaviour>
- FLYNN, Rob, BELLABY, Paul and RICCI, Miriam (2009). The 'value-action gap' in public attitudes towards sustainable energy: the case of hydrogen energy. [online]. *The Sociological Review*, 57 (2) 159 -180.

- FUTERRA (2011). *New Rules: New Game; Communications tactics for climate change*. [online]. London, Futerra.  
<http://www.futerra.co.uk/wp-content/uploads/2011/09/New-Rules-New-Game1.pdf>
- GREAT BRITAIN (2008). *Climate Change Act 2008, Chapter 27*. [online]. London, The Stationary Office.  
[http://www.legislation.gov.uk/ukpga/2008/27/pdfs/ukpga\\_20080027en.pdf](http://www.legislation.gov.uk/ukpga/2008/27/pdfs/ukpga_20080027en.pdf)
- GREAT BRITAIN (2011). *Behaviour Change and Energy Use*. [online]. London, The Cabinet Office.  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/48123/2135-behaviour-change-and-energy-use.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48123/2135-behaviour-change-and-energy-use.pdf)
- GREAT BRITAIN (2012). *Energy Use Behaviour Change*. [online]. London, Parliamentary Office of Science and Technology.  
<http://www.parliament.uk/business/publications/research/briefing-papers/POST-PN-417/energy-use-behaviour-change>
- HARGREAVES, Tom (2011). *Practice-ing behaviour change: Applying social practice theory to pro-environmental behaviour change*. *Journal of Consumer Culture*, 11 (1) 79-99.
- KOLLMUSS, Anja and AGYEMAN, Julian (2002). *Mind the Gap: Why do people act environmentally and what are the barriers to pro-environmental behavior?* [online]. *Environmental Education Research*, 8 (3), 239-260.
- LUCAS, Karen., *et al.* (2008). *Promoting pro-environmental behaviour: existing evidence and policy implications*. [online]. *Environmental Science & Policy*, 11, (5) 456-466.
- MANSOURI, Iman, NEWBOROUGH, Marcus and PROBERT, Douglas (1996). *Energy Consumption in UK Households: Impact of Domestic Electrical Appliances*. [online]. *Applied Energy*, 54 (3) 211-285.
- MARKLE, L. Gail (2013). *Pro-Environmental Behavior: Does It Matter How It's Measured? Development and Validation of the Pro-Environmental Behavior Scale (PEBS)*. [online]. *Human Ecology*, 41 (6), 905-914.
- MILES, B. Matthew and HUBERMAN, A. Michael (1994). *Qualitative Data Analysis: An Expanded Sourcebook*. 2nd ed., London, Sage.
- OWENS, Susan and DRIFFILL, Louise (2008). *How to change attitudes and behaviours in the context of energy*. [online]. *Energy Policy*, 36 (12) 4412-4418.

- PALMER, Jason and COOPER, Ian (2013). United Kingdom Housing Energy Fact File. [online]. London, Department of Energy & Climate Change. [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/345141/uk\\_housing\\_fact\\_file\\_2013.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/345141/uk_housing_fact_file_2013.pdf)
- PIERCE, James, SCHIANO, J. Diane and PAULOS, Eric (2010). Home, Habits, and Energy: Examining Domestic Interactions and Energy Consumption. [online]. New York, 1985-1994.
- PULLINGER, Martin, LOVELL, Heather and WEBB, Janette (2014). Influencing Household Energy Practices: a Critical Review of UK Smart Metering Standards and Commercial Feedback Devices. [online]. *Technology Analysis & Strategic Management*, 26 (10) 1144-1162.
- SCHULTZ, P. Wesley (2014). Strategies for Promoting Proenvironmental Behavior: Lots of Tools but Few Instructions. [online]. *European Psychologist*, 19 (2), 107-117.
- SHOVE, Elizabeth, PANTZAR, Mika and WATSON, Matt (2012). *The Dynamics of Social Practice: Everyday Life and how it Changes*. [online]. London, Sage.
- STEG, Linda (2008). Promoting Household Energy Conservation. [online]. *Energy Policy*, 36 (12) 4449-4453.
- STERN, C. Paul (2000). Toward a Coherent Theory of Environmentally Significant Behavior. [online]. *Journal of Social Issue*, 56 (3) 407-424.
- TABI, Andrea (2013). Does pro-environmental behaviour affect carbon emissions? [online]. *Energy Policy*, 63 972-981.
- UNITED NATIONS ENVIRONMENT PROGRAMME and FUTERRA (2005). *Communication Sustainability: How to produce effective public campaigns*. [online]. London, UNEP, Futerra. DTI/0679/PA <http://www.unep.fr/shared/publications/pdf/DTIx0679xPA-CommunicatingEN.pdf>
- WHITMARSH, Lorraine, O'NEILL, Saffron and LORENZONI, Irene (eds.) (2011). *Engaging the Public with Climate Change: Behaviour Change and Communication*. London, Earthscan.