Exploring environmental behaviour at home among UK women and its importance to develop an appropriate communication strategy for energy saving

Estudio exploratorio sobre la conducta ambiental en el hogar entre las mujeres del Reino Unido y su importancia para el desarrollo de una estrategia de comunicación para el ahorro de energía

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RESUMEN. Alrededor de una quinta parte del consumo total de la energía en el Reino Unido proviene de las zonas residenciales que además muestra una tendencia creciente, a pesar de que se dice que se podría ahorrar de un 10 a un 20% de energía en el hogar únicamente con cambiar algunos hábitos de consumo. Así pues, el objetivo principal de este artículo es proporcionar información que ayude a fortalecer la participación de los proveedores de servicios de energía, en favor de la disminución del consumo, a partir de la creación de una estrategia de comunicación enfocada en el cambio de hábitos y conductas. La investigación se enfoca en el consumo directo de energía en los hogares del Reino Unido, teniendo como grupo de estudio a las mujeres de 30 a 45 años. Se aplicaron 102 encuestas y 5 entrevistas en profundidad para conocer y entender las actitudes cotidianas relacionadas con el consumo energético en la vivienda, así como la comprensión de las motivaciones para ahorrar energía y los obstáculos que para ello encuentran las participantes. Los resultados muestran que las encuestadas están muy interesadas en conocer con mayor claridad la cantidad de energía y de dinero que gastan y que podrían ahorrar al realizar ciertos cambios en sus hábitos de consumo cotidiano. Ellas parecen estar dispuestas y motivadas para realizar los cambios necesarios. Sin embargo, tal parece que un factor clave para que esto ocurra es que reciban la información adecuada por los medios o canales de comunicación pertinentes.

Palabras clave: Brecha actitud-comportamiento, Ahorro de Energía, Consumo de Energía en los Hogares, Estrategia de Comunicación.

ABSTRACT. *About one-fifth of total global energy consumption comes from residential sector and this ratio applies for the UK as well. Moreover, the domestic energy consumption shows growing tendency, though 10-20% potential energy saving would be available by changing behaviour of people. The main aim of this paper is to provide information that helps to strengthen service providers' involvement into changing people's energy saving and environmental behaviour by creating a communication strategy for them. The report concentrates on direct energy consumption in UK households and the communication strategy's target group is women between ages 30-45. Qualitative and quantitative research methods were applied for exploring attitude-behaviour gap, gathering information about people's environmental behaviour at home, understanding motivations to save energy and discovering the direct and indirect barriers against saving energy. 5 depth interviews and a questionnaire with 102 respondents from the target group helped to determine the most suitable messages and communication channels. The results unequivocally shows that respondents are interested in how much energy they do/could save, open for feedbacks about their energy consumption and they are motivated to save more energy.*

Key words: *Attitude-Behaviour gap, Energy saving, Energy consumption in homes, Communication strategy.*

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Background

Consumer behaviour and households' energy demand are again in the spotlight which is driven from concerns about climate change, greenhouse gas (GHG) emissions, global warming or fossil fuels depletion. "About one-fifth of total global energy demand originates from the residential sector – from the requirements to heat, cool, and light residential dwellings" (Brounena, *et al.*, 2012). The situation is the same in the UK as well, as 29 percent of the overall energy consumption was domestic use in 2013. The domestic energy consumption is growing again after a fall in 2010 and it is over the level of 1970 in the UK (Khan & Wilkes, 2014). Total domestic energy consumption has increased by 19% between 1970 and 2013 (Department of Energy & Climate Change, 2014) and sustainable energy supply is not able to keep up with the energy demand.

Although currently available technologies could decrease the energy consumption but people's behaviour is a determinant factor of its pattern. It is indisputable that current behaviour patterns should improve in order to achieve changes in domestic and global energy consumption. A number of researches proved that there is only low correlation between people's attitude and behaviour (Armitage & Christian, 2003) (Scott & Willits, 1994) (Gordon, 2002) known as attitude – behaviour gap (Ajzen, 2001) (Vermeir & Verbeke, 2004). Thus, increasing environmental awareness and shifting people's attitude is not enough to reach changes in domestic energy consumption and energy saving. Studies have showed that 10-20% potential energy saving is available by changing people's behaviour (Carlsson-Kanyama *et al.*, 2005) (Linde *et al.*, 2006).

Within this context, the main aim of this study is to establish a communication strategy for service provider companies and to determine the communication channels which are the most suitable for supporting behaviour changes in energy consumption and environmental awareness. The objectives are to gather the utmost information about people's environmental behaviour at home, to understand deeply their motivations to save energy, to live more environmental friendly life and to discover direct and indirect barriers of energy saving behaviour.

The report concentrates on direct energy consumption such as use of gas, electricity and fuel while indirect energy use (for instance production, transportation) (Abrahamse & Steg, 2009) is out of the scope of the study. The UK's government has identified 12 headline goals in 5 main environmental sectors, primarily concentrated on domestic environmental behaviour, which are: personal transport, home's energy, home's waste, home's water and eco-products (DEFRA, 2008).

This study also examines these environmental areas in UK households, with exception of 'Eco-products'. They were excluded because it means indirect energy consumption, which is not part of this analysis.

The main aim is to create a communication strategy for service providers which concentrate on women and families.

Behaviour models

Ajzen's (1991) theory of planned behaviour defines the behaviour as individual's *intention* to make a given behaviour. The theory demonstrates that behaviour's motivation (*intention*) is influenced by three determinants: *attitude toward the behaviour*, *subjective norm* and *perceived behaviour control*.

Attitude toward the behaviour refers to the individual's appraisal or evaluation of the aimed behaviour. *Subjective norm* means the social factor and social pressure to perform or not the behaviour. *Perceived behaviour control* implies the perceived difficulties or ease and ability of carrying out the behaviour and it could reflect on past experience as well (Ajzen, 1991). Consequently, to reach changes in environmental and energy consumption behaviour of people, the intention and its determinants have to be influenced and changed not only the behaviour.

There is another study that shows that interventions, policies and strategy for changing behaviour could be characterised by the source of behaviour, intervention functions and policy categories. This behaviour model is also based on the interaction of three factors, which are not totally the same as in the model of Ajzen (1991), "Capability", "Motivation" and "Opportunity" (Michie *et al*., 2011).

Capability means having the required skills and knowledge, motivation embraces habitual processes, emotional responding and analytical decision-making while opportunity includes all the factors that make the behaviour possible. Though, this is only a model for behaviour but it can support finding the right strategy to change behaviour after the behavioural target is defined and which components of behaviour need to be changed to achieve the desirable aims.

Other behaviour studies also proved the importance of this framework in behaviour change. Barr (2007) applied in his study nearly the same behaviour framework but in his research the "Situational" and "Psychological" variables were the determining factor of "Behavioural Intention" and "Behaviour". "Environmental Values" were included in this framework, which means the skills, knowledge and general environmental standard.

With regard to the capability, motivation and opportunity model, Michie *et al*. (2011) developed the behaviour change wheel (BCW) which could be applied to identify the most effective and efficient intervention strategy. The three components of behaviour were divided into subdivisions: *capability* into *physical* and *psychological capabilities*; *opportunity* into *social* and *physical factors*; *motivation* into *automatic* (involving evaluations and plans) and *reflective* (including emotions and impulses that arise from associative learning) motivation.

Then the research team identified the most suitable interventions, the activities which were designed to change behaviours by changing the source of behaviour, capability, opportunity or motivation. At the end, appropriate policies were determined which include the decisions made by authorities regarding the interventions to reach the desirable behaviour. The BCW specifically represents and organizes the factors of behaviour, the suitable interventions and it is a good tool to support defining the right policy strategy. However

to reach behaviour goal, one of these possible interventions and policies could not be enough and this makes the model complex.

Most of the above mentioned models are really beneficial to understand the behaviour but they have some limitations. These models mainly focus on psychological and social factors which define the behaviour and tend to refer less on external environmental factors such as technological development, economy or the geographical area and its facilities. However, these external elements could also be decisive to influence factors of the behaviour. Furthermore, these models can act as support to know the behaviour even though they are simplified enough to help understanding the main elements (Government Communication Network, 2013). In addition, the target population is not segmented in these models, whereas in reality different factors are dominant for different people. Moreover, adopting a model alone is an insufficient way to reach behaviour change; the key of success is the proper comprehension of the whole process (Darnton, 2008), the target group and the obstacles of change.

There are some reports and studies which analyse strategies, policies to increase environmental awareness and change environmental behaviour. The report of Department of Enterprise, Trade and Investment Northern Ireland (Rogerson *et al.*, 2014) made a survey in 2009 to gather information concerning residents' attitudes and behavioural patterns to sustainability and try to offer different ways for encouraging behavioural change in Northern Ireland. The survey showed that sustainability, climate change and environment have gained much lower importance by the respondents than economic issues, crime and violence, health or education (Rogerson *et al.*, 2014). In addition, the report and most of governments' actions and measures are mostly concentrated on possible actions such as interventions, policies, penalties or regulatory/legislative measures to change people's environmental behaviour. Beside regulation, economic instrument such as taxation, pricing and other incentives are applied to influence energy consumption. Though, changing behaviour only by these external instruments cannot be efficient (Foxall, 2002) so there is need for raising the level of awareness, changing social norms and values and psychological influences as well.

Rogerson *et al.*, (2014) mentioned some factors which could play important role in changing environmental behaviour of people. Moreover, these factors correspond with Ajzen's theory (1991) as well. The factors of *new experience; new personal, community or national situations* are correspondent with *perceived behaviour control.* The elements of *new information; media and marketing* could help to provide information for individuals, which are similar with the *attitude toward behaviour* in Ajzen's (1991) theory. The components of *family, peer/group pressure* in report of Rogerson *et al.* (2014) is consistent with the *subjective norm* component in Ajzen's (1991) theory.

In 2007, Defra has had Brook Lyndhurst conduct a qualitative research regarding public understanding of energy consumption home. The research applied four phase: a literature review on energy habits of peo-

ple; focus groups; in-home energy audits and depth interviews. The research proved that research participants' understanding environmental and climate change issues were high. Nevertheless, low correlation was shown between participants' attitudes and their behaviours and the study found out that the attitude-behaviour gap appears critical in the case of energy saving and consumption. Moreover, the gap could make more difficult and challenging the policy making (Brook Lyndhurst Ltd., 2007).

Therefore, Defra has created a model, which is named Defra's 4E model, and it offers a checklist for policy makers to support them applying the most suitable package of measures to achieve their behaviour change goals (Darnton, 2008). The 4E means Enable, Encourage, Engage and Exemplify. Behind each E, the potential interventions are aligned which could trigger the behaviour change.

In conclusion, the aim of behaviour change is to lead and support people on their behaviour development in order to reach the highest stage of behaviour change (Figure 1). Moreover, knowing the stage of people regarding the issue is the key to design the most suitable communication strategy and interventions (UNICEF, 1999).

The review has identified several behaviour models and frameworks. The general conclusion of them is that, it is not enough if only one component of behaviour is influenced to achieve behaviour change but identification of behaviour's influencing factors is vital towards the success. Furthermore, there is no doubt that people should have a sound rational for changing their environmental behaviour (Foxall, 2002) at home and this is also charge of the communication strategy. Beside models, research data can help to highlight the underlying factors

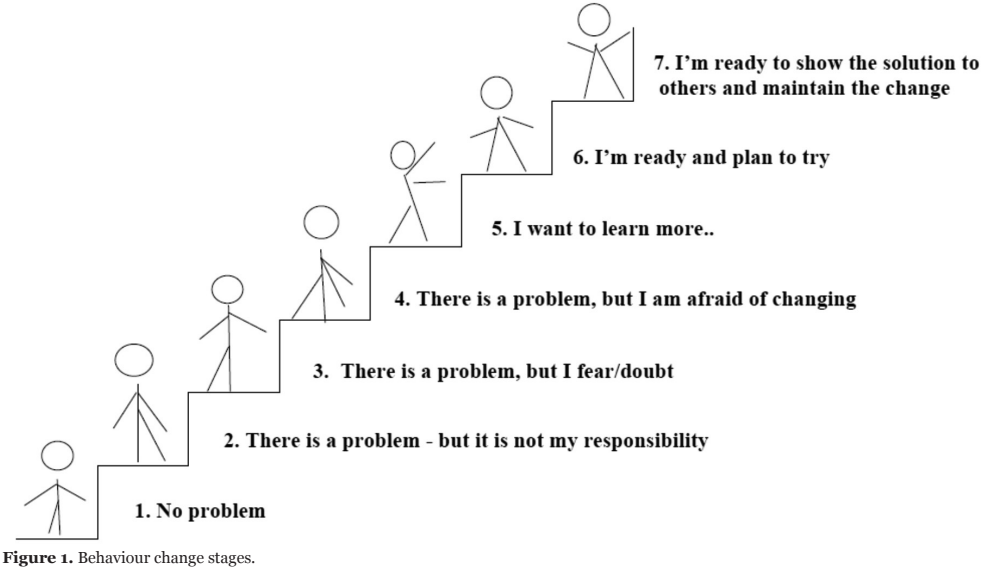

Figure 1. Behaviour change stages.
Source: (UNICEF, 1999: 7).

and drivers and barriers of target group's behaviour (Darnton, 2008).

Women's role in energy consumption

Defra's research (DEFRA, 2008) (Brook Lyndhurst Ltd., 2007) segmented the population according to pro-environmental behaviours and people's values regarding the environment, specifically: Greens; Consumers with a Conscience; Wastage Focused; Currently Constrained; Basic Contributors; Long-Term Restricted; and Disinterested. Contrarily, communication strategy of the service providers has to focus on most of the people who can strongly influence domestic energy consumption and not only one part of the society according to its environmental values. So this report focuses on women's (between ages 30-45) pro-environmental and energy saving habits as other studies found consistently that women have stronger pro-environmental behaviour than men (Longhi, 2013). Women are responsible for the completion of most of the household chores, such as laundry, food shopping, cooking, cleaning or childcare (Farhar, 1998) (Carlsson-Kanyama & Linden, 2007). Furthermore, they might have the strongest influence on their children and on the future generations' pro-environmental behaviour (Elnakat & Gomez, 2015).

People, who are living in couples with kids have lower pro-environmental behaviour than people living alone and couples without children (Longhi, 2013). However, it would be crucial for the children to see positive examples and experience strong pro-environmental behaviour in their families in order to live more environmental friendly life style. It is assumed that children's behaviour is highly influenced by their mother owing to more time spent together and the greater access to the children's daily routine and schooling (Elnakat & Gomez, 2015). The study of Elnakat and Gomez (2015) is setting out some fields of life where mothers' influence is found and relevant such as mother's education influence on her children's outcome, consume behaviour, social behaviour, and health or reading/math proficiency. Accordingly, why not correlate mother's influence on environmental behaviour and household energy consumption as well? Moreover, there are studies which proved that women are more likely to behave an environmental friendly way, they tend to pay more for environmental friendly products or put on more clothes when it is cold instead of adjusting the heating (Lynn & Longhi, 2011).

Communication strategy

It is evident that support of organizations, institutions and corporations is necessary to encourage people to maintain more environmental conscious lifestyle (Foxall, 2002). Therefore, this study concentrates on the communication strategy of service providers and energy companies aiming to support behaviour change of people regarding energy saving and environmental behaviour. The most important attribute of the communication is that it is a two-way information sharing process. It is vital that both parties of the communication have the opportunity and are able to express

themselves since feedbacks are also crucial components of communication.

According to the well-known and influential communication model of Shannon and Weaver (1949), main elements of the communication are: an information source; a transmitter (sender); a channel, the receiver, the message and the feedback (Communicationtheory.org, 2010). Strategic communication is defined in different ways in the literature. Paul's definition is more or less aligned with explanations of others: "it is coordinated actions, messages, images and other forms of signalling or engagement intended to inform, influence, or persuade selected audiences in support of objectives" (2011, p. 3). Therefore, strategic communication is the framework for determining the most suitable approach to communicate a message and share information.

Consequently, communication strategy should (Paul, 2011) (EPA, 2008) (UNICEF, 1999) (EPA, 2012) (Sibley, 2009):

- Define the aims and clear objectives of communication
- Identify the target group and key stakeholders
- Outline the key messages
- Determine the vehicles and methods of communication
- Plan the assessment and feedback methods.

UNICEF (1999) worked out a model, named as ACADA model, for planning their communication programs, which help them to plan, execute, observe and control a behaviour-focused communication program. This model could be helpful for any environmental communication program as well, to work out the most suitable strategy and achieve its objectives.

To sum it up, the most important steps to promote sustainable behaviour are (James, 2010):

- Attract and keep attention
- Use persuasive messages and strategies to encourage change
- Define the most suitable delivery methods
- Take into consideration the target audience.

The UK government, local councils and environmental groups are committed to behaviour change regarding energy saving and environmental lifestyle. For instance, the UK government launched the "Are You Doing Your Bit?" environmental campaign in 1998 (Barr, 2007). The campaign aimed at encouraging people to implement small but important behaviour changes in their everyday life. The easily understandable messages drove making simple changes in daily actions and showed how these could have positive impact on the environment (OECD, 1998-2000).

However, according to the data of Department of Energy & Climate Change (2014), the energy consumption of households is still not decreasing significantly. Hence, involving the service providers and consumer goods companies more deeply into the behaviour change and promoting the process by them is inevitable. They have to act accordingly, even if their economic interest is not to cut back the volume of services and therefore their profit (Foxall, 2002). Nevertheless, the issue of involving service providers and forwarding cooperation is over the border of this study. Although there could be possible solutions such as offering tax advantage being involved into environmental behaviour

programs; subsidies or any other economic instruments or implementation of policy for these companies to take part in this process.

Methodology

A lack of information on the current environmental awareness, attitudes and behaviours of people in the UK would make it difficult to identify the suitable communication channels and appropriate messages for changing behaviour of people and the future generation. Since collecting data and information about the target audience is essential in order to find the most suitable communication channel and define the most effective message.

The methodology of this study[1] involves three main steps: a systematic literature review focusing on the main behaviour models, collecting data by questionnaire and gathering deeper insight into people's daily environmental behaviour and their energy saving practices by deep interviews. The questionnaires consisted of 27 questions focusing on the environmental behaviour and 6 general, demographic questions. The first part of the questionnaire concentrated on the transport, electricity consumption, heating, water usage and waste management. The second part collected information about the service providers, information sources regarding environmental issues, behavioural patterns and motivation of people. The questions were followed by clearly defined answer categories and by instructions where needed. This type of questionnaire strongly supports the accuracy of the gathered data and helps the evaluation process (Saris & Gallhofer, 2014).

The data collection method was sending the questionnaire to respondents and searching them on social media websites such as Facebook, Twitter, LinkedIn as these are the fastest and most resource-effective method. The results of questionnaire were analysed by the IBM's SPSS (Statistical Package for the Social Sciences) software package.

Interviewees were invited based on their indication in the questionnaire where they had the option to provide their email address. Five interviews were conducted with women from the target group. The aim of the interviews was to understand deeply their motivations to save energy and live more environmental friendly life. Outcomes of interviews were evaluated qualitatively and it was measured whether their answers strengthen the quantitative results of questionnaire.

Results

134 respondents took part in the research and answered the questionnaire beside the 5 depth interviews. The data collection has mainly concentrated on the target group, which was women between ages 30-45 but there were some respondents outside of this group. However, during the evaluation only those respondents' answers (n=102) were

1 It is important to mention that this is part of a broader study that included a communication strategy guide based on the findings that are generally described here.

taken into consideration who were part of the target group.

The questionnaire was valuable in understanding the behaviour of people at home, collecting information about barriers against environmental friendly behaviour and examining how people perceive service providers communication as well as understanding their motivation on saving energy.

About 70-80% of respondents answered that they always or usually act according to energy saving instructions such as turning off lights and appliances or setting their washing machine to max 30 °C. When buying new appliances 42% of the respondents considered the brand important, 58% the environmental performance and 68% the energy efficiency. Many of the respondents apply water saving tips but only around 1/5 of them turn off the water while soaping their body or washing their hair and 1/6 adjust the pressure of the power shower. 91.2% of the target group collect the waste selectively and 66% of them collect 3, 4 and 5 or more types of the waste.

81% of the respondents are motivated to save more energy. However, about 80% of people stated that they would be more motivated to save water, electricity or gas if it was more expensive above a certain amount of consumption.

Contingency tables were developed to summarize the relationship between two variables depicting the number of times each of the possible category combinations occurred in the sample data. For example, 34 respondents, who are motivated and try to do what they can to save energy, also declared that they do some energy saving actions and they believe they can make a difference. This means most of the people who are motivated to save energy do also some energy saving actions but they haven't reported that they are really active so they could do more.

The strongest barriers against energy saving were lack of feedbacks (quantity of energy saved over a given period of time) and lack of energy saving tips, which may come from service providers.

54.9% of respondents answered that they get practical suggestions from their service providers on how to use less energy. According to the questionnaire, the main forms of these information and vehicles are leaflets and mails. Nevertheless, for the question "From which source(s) do you get information on environmental questions and saving energy?" (Any number of answers could be selected), the internet and websites were selected the most often, the articles, newspapers, magazines and television after that.

In other words, there exists a contradiction between the communication channel applied by the service providers and the communication channels, which act as information sources for people. So the service providers have to change their communication channels to their customers in order to effectively provide information regarding energy saving tips.

Moreover, the respondents answered in the highest number that they trust service providers, local council and environmental groups the most, in terms of providing information on environmental issues and energy saving tips.

The results of the depth interviews strengthen the consequences of the questionnaires. The

interviews supported the research with additional information. To sum up, it was found that people are motivated to change their behaviour and save energy, service providers are among the most trusted sources but they have to change their communication channel to reach people and providing them the right message to encourage behaviour change and energy saving.

Discussion

The communication strategy for encouraging people to save energy and live more environmental friendly life style has a strong principle which was well defined in the report of FUTERRA Sustainability Communications Ltd. (2005, p. 2): "Changing attitudes towards climate change is not like selling a particular brand of soap – it's like convincing someone to use soap in the first place".

Information alone is probably not important enough to change environmental behaviour (Foxall, 2002). This is disappointing as most of the environmental campaigns are built on giving information about environmental issues and energy consumption. The same results were pointed out by Seaver and Patterson (1976): "educational campaigns" are more likely to influence environmental attitudes of people than their behaviour, which in fact would have significant positive impact on the environment. Although it was mentioned and proved at the beginning of the study that changes in attitude are not sufficient to reach decrease in energy consumption because of attitude-behaviour gap. Moreover, the awareness-information-decision-action logic was also questioned by Barr (2007) as he argued that the environmental values and awareness are in the centre of environmental conscious behaviour.

Seligman and Darley (1976) and later Foxall (2002) have also reinforced the effect of feedback as it is an important energy-control technique. Additionally, it was emphasized in several studies that the feedback could positively influence the environmental behaviour. This statement was also confirmed by the questionnaire and during depth interviews as well. 29.13 and 30.10% of respondents stated that they would apply more water and energy saving tips if they knew how much energy or money they could save.

Conclusion

This study sought to explore how environmental behaviour and energy saving habits could be changed in order to decrease energy consumption in UK households and the share of residential energy consumption. Studies showed that relevant amount of energy could be saved via changing people behaviour. Nevertheless, it is proved that increasing environmental awareness and changing people's attitude is not enough to achieve significant decrease in energy consumption. So narrowing attitude-behaviour gap in environmental behaviour of people is crucial for the success. As service providers are in close relationship with people, the aim of the paper was to emphasize the importance of an adequate communication strategy for them. Its target group were women

between ages of 30-45, as they might have the strongest influence on families' energy consumption and environmental behaviour of future generations. Behaviour models help to identify the behaviour factors and barriers of pro-environmental behaviour and energy saving. Attitudes towards energy saving and environment are not only changing slowly, but in reality do not turn into effective energy consumption and behaviour in homes due to attitude-behaviour gap. Encouraging energy saving is unimaginable without involving companies and the service sector into the process as they are in contact regularly with people, so their communication strategy is fundamental in order to achieve changes. Communication strategies are nearly the same for every company, however communication plans have to be tailor made on a company level, based on its services and customers. The results of questionnaires and interviews also showed that continuous feedback and information from trusted sources could be the drive of energy saving and changes. It should be obvious that involving every company that has a significant effect on the behaviour of consumer society into changing people's energy saving behaviour is inevitable in order to achieve relevant decrease in energy consumption. Moreover, it should be considered which tools could support achieving a more energy saving and more conscious environmental behaviour beside applying smart meters, energy performance certificates, communication strategy. Applying differentiating tariffs, personal carbon allowances, grant schemes should be examined.

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