

Engaging Homeowners in Energy Efficient Home Improvement

Volume 1

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Abstract

The UK housing stock suffers from one of the lowest energy efficiency levels in Europe. This results in high annual carbon dioxide emissions and the grave problem of fuel poverty. While new dwellings achieve a certain level of energy efficiency through the standards enforced by the Building Regulations, the rate of replacement of the existing inefficient stock is extremely low. Significant improvements are possible through refurbishment, providing appropriate resources are available. But in a society where homeownership accounts for 70% of the total number of households, the future of most UK housing depends upon the will of private homeowners. While the political climate does not support the introduction of legislation to enforce retrospective energy standards in dwellings, the only realistic means to achieve the goal of an energy efficient homeowner-stock is to engage homeowners in the process, through energy efficient home-improvement. This is the challenge that drives this study.

The thesis draws on interviews with relevant domestic energy efficiency programme providers and previous research within a variety of disciplines, in order to build an integrated conceptual framework for the design of domestic energy efficiency information and advice programmes for owner-occupiers. The thesis argues that an everyday householder-centred approach be taken by experts in the development of programmes, in order to increase the likelihood of engaging householders.

The study focuses on the use of the Home Energy Report as a vehicle for providing information and advice. The proposed conceptual framework is compared with the views of homeowner-occupiers who have received such reports from their mortgage lenders in order to find support for and to further refine the framework themes. The study concludes with a series of recommendations for the development of the Government's proposed seller's pack home energy report programme based on the everyday householder-centred approach.

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1. Introduction

1.1 Research motivation

It is widely accepted that carbon dioxide (CO₂) emissions resulting from human activity are the most significant factor in the warming of the earth's atmosphere above acceptable levels (IPCC 2001). The Royal Commission on Environmental Pollution, in proposing recommendations for achieving a long-term reduction in world CO₂ emissions, suggests that for the UK this could mean a reduction of 60% from 2000 annual carbon dioxide emissions by 2050 and perhaps of 80% by 2100 (RCEP 2000). Since the domestic sector contributes 28% of total UK CO₂ emissions (year 2000 Housing Energy Efficiency Best Practice Programme 2002) this is a significant area to tackle.

The UK housing stock suffers from one of the lowest energy efficiency levels in Europe, with an average SAP rating¹ approaching 43² (Source BRE domestic energy fact file, DTI 2003:83). This results, on the one hand, in high annual CO₂ emissions of 0.71 tonnes of carbon per capita³ and, on the other, the grave problem of fuel poverty, officially recognised to affect around 3 million households (DEFRA and DETR 2003:19). While new dwellings achieve a certain level of energy efficiency through the standards enforced by Part L of the Building Regulations, the rate of replacement of the existing inefficient housing stock is extremely low. In fact, less than one tenth of 1% of the UK stock is demolished each year⁴. Action is clearly needed if both social and environmental sustainability are to be achieved.

The UK Home Energy Conservation Act 1995 set a target of 30% improvement in domestic energy efficiency to be achieved by 2010. Much time and effort has gone into researching how to refurbish dwellings for increased energy efficiency. The Government's Housing Energy Efficiency Best Practice Programme produces numerous relevant guides testifying to the fact that we know how to do it (see for example BRECSU and ESTU 1999a; BRECSU and ESTU 1999b; BRECSU and ESTU 1999c). Significant improvements are, therefore, possible in the public sector housing,

¹ Standard Assessment Procedure – this national energy efficiency rating method gives the dwelling a rating between 0 (minimum energy efficiency) and 100. SAP 60 is generally considered the minimum rating for a reasonable level of energy efficiency.

² Figure for 2000.

³ Figure based on the mid 2000 UK population (source: Office for National Statistics) and projected domestic greenhouse gas emissions for 2000 (source: DETR 2000c).

⁴ Estimate based on The English House Condition Survey, 1996 (DETR 1998).

providing appropriate resources are made available to Local Authorities and Registered Social Landlords. But in a society where homeownership is highly desirable and therefore accounts for 70% of the total number of households (DTLR 2001c), the future of most UK housing depends upon the will of private homeowners. While the political climate does not support the introduction of legislation to enforce retrospective energy standards in dwellings, the only realistic means to achieve the goal of an energy efficient homeowner-stock is to engage homeowners in the process, through energy efficient home-improvement. This is the challenge that drives this study.

The author takes the position that research cannot be value-free. Rather than choosing to carry out consciously value-laden research determined by a specific theoretical position, the author aims instead to be self-reflective. In this way the author seeks to acknowledge the potential influence of her values, biases and assumptions, on the research process and on the subsequent findings. At this point the basic principles held by the author, which permeate all of the work, should be made explicit. First it is worth explaining the relevant experience of the researcher in the research field and reflecting on how this might have influenced her perspective as the work has evolved.

The author began this study as a private renter of property – a room in a shared house. Having recently completed a Postgraduate Diploma in Architecture she had access to limited financial resources. The idea of carrying out home improvements that increased energy efficiency was therefore an abstract idea and something about which she had only second-hand experience. She had pursued ideas concerned with eco-design and sustainability in her previous studies and had specialised in this area for the Diploma in Architecture. It would be reasonable to describe the author as idealistic with regard to these issues at that time.

The author's experience and position were to change over time, as changes in personal circumstances meant that she became a homeowner during the second year of study, although still one with limited financial means. Of course, she was keen to implement some of her own energy efficient home improvements. However, she was also forced to confront all of the potential barriers which appear in the context of the real world and which accompany the human condition. At this point idealism was tempered by reality. Her empathy for other homeowners undoubtedly increased. As time went on her household income increased, bringing further insight into the research question.

Overall the author's idealism has reduced greatly since day one of this study. Her own experience of being a homeowner has undoubtedly influenced her perspective on the research question and has hence influenced the data collection methods themselves. However, the author believes that this has predominantly helped rather than hindered the study, giving a more balanced perspective which has perhaps overcome the potentially blinkered view of the idealist. This she believes will result in a conceptual framework which is more in touch with the empirical findings and ultimately more practical and realistic in its implications.

Though idealism has waned, that is not to say that the author does not hold certain beliefs that exert an influence on the way in which she interprets data and the findings. The following basic principles, therefore, permeate this study:

- Energy efficient home improvement is a positive action, potentially reducing domestic CO₂ emissions and hence contributing to a reduction in the negative impact of human activity on the earth;
- Energy efficient home improvement has the potential to improve the health and well-being of individual householders.

In parallel with study for this thesis, the author has been an architecture design tutor and gained a Postgraduate Certificate in Higher Education. She has therefore developed individual basic principles related to education. Some of these principles become relevant in the light of this thesis when one draws parallels between the teacher-learner relationship and the energy advisor-householder relationship; both of which could be characterised as an expert-layperson relationship. These principles are rooted in a fundamental belief in democratic education and in collaborative and learner-centred modes of teaching and learning. They are as follows:

- existing lay knowledge and experience are valuable and should be built upon;
- experts should both facilitate and inform;
- lay people should be involved in the identification of needs, setting of goals and planning of relevant activities.

The broad question driving the research is:

How can the homeowner-occupiers of England be engaged in energy efficient home improvement?

This research attempts to answer this question using a theory-building approach to propose a conceptual basis for the design of a domestic energy efficiency programme, considering the principles cited above. On the basis of this conceptual framework, specific recommendations are made for the improved effectiveness of the Government's proposed seller's pack home energy report programme (explained in chapter 6). It is important to emphasise that the aim of this work is not the implementation of the home energy report, but the proposal of a conceptual framework, which could guide further development of this and other relevant programmes.

1.2 Terminology

Homeowner-occupiers of England: people who own a dwelling in England, whether out-right or through mortgage payment and who also live in that dwelling. Also included are those people who are in the process of obtaining a mortgage for a dwelling in England and who intend to live in the dwelling.

Home improvement: an alteration or addition to a dwelling, which is considered by the homeowner to improve the existing condition.

Energy efficient home improvement: a home improvement which will reduce the amount of energy consumed as a result of operating a dwelling (heating, cooling and lighting) if the intensity and pattern of operation for the dwelling remain constant.

Domestic energy efficiency programme: a programme of activity which aims to increase the energy efficiency of dwellings (i.e. reduce the amount of energy consumed as a result of operating each dwelling if the intensity and pattern of operation remain constant).

1.3 Thesis structure

Following this introduction, *Chapter Two* begins with an investigation into the English housing stock and domestic energy efficiency, discussing these issues in the context of: global warming; international and national targets relating to reduce greenhouse gas emissions; and the health and well-being of householders. The chapter focuses

attention on the owner-occupied stock and the particular challenge, as well as the opportunity, which is presented by this sector. **Chapter Three** describes the methodological approach taken in carrying out the empirical study and its relationship to the literature, and explains the reasons for the adopted theory building, multi-strategy approach. **Chapter Four** focuses on phase 1 of the empirical research: semi-structured interviews with domestic energy efficiency programme providers. The data collection method for this case study is described in detail and findings reported and discussed, ending with the presentation of an outline conceptual framework which informs the literature review and further empirical research.

Chapter Five presents the literature review, in which human energy-use behaviour and the role of information in modifying this behaviour are explored. The findings of this review further inform the developing conceptual framework for the development of an effective programme to engage homeowners in energy efficient home improvement. The proposed seller's information pack home energy report is introduced in **Chapter Six**. The potential of the programme to provide owner-occupiers with domestic energy efficiency information and advice is described along with relevant preliminary findings from a previous pilot study. The chapter concludes by highlighting the opportunity for further empirical research into the householder responses to the home energy report (phase 2), which might inform both the development of the conceptual framework and also the development of the programme itself.

Chapter Seven explains the methods used to carry out phases 2 and 3 of the empirical study, focusing on the home energy report in use. The chapter introduces the research collaborators and the specific home energy report programme being studied. Then the aims are identified, the data collection and analysis methods are detailed and the limitations of the study are made clear. **Chapters Eight, Nine and Ten**, present the findings of each phase of the study. The first set of findings relates to the take-up of home improvements and perceived motivation factors and barriers. The second set focuses on data from the follow-up interviews and relates to the householders' experiences of pursuing energy efficient home improvements and the reasons why some intentions had not been fulfilled. Finally, the third set focuses on the householders' views of the report itself and their direct and indirect suggestions for its improvement. Each set of findings is discussed in relation to the themes of the conceptual framework and their implications for the validity of the framework are described.

Chapter Eleven draws together the findings from each phase of the research in discussion. The implications of the findings for the developed conceptual framework are discussed and the final version of the framework is presented. On this basis, conclusions are drawn in **Chapter Twelve**. The chapter presents a series of recommendations for the improved effectiveness of the Government's proposed seller's pack HER programme, based on the conceptual framework - an everyday householder-centred approach to programme design. Suggestions for further research are made.

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2. Background

2.1 Chapter outline

This chapter examines current levels of energy efficiency in the English housing stock and explores the two primary factors that drive policy efforts to improve domestic energy efficiency in the UK: climate change and well-being. The owner-occupied housing sector is described in more detail with regard to energy efficiency and the particular challenge, as well as the opportunity, that is presented by this sector is outlined.

2.2 English housing quality and energy efficiency

The English housing stock has one of the lowest levels of energy efficiency to be found in Western Europe. While there is no official definition of 'reasonable' energy efficiency, a rating in the region of SAP¹ 70 is generally accepted as the recommended minimum (NEA 2002a:3). Current levels in the English stock are, however, far from reasonable, approaching just SAP 43 (Source BRE domestic energy fact file, DTI 2003:83).

Poor levels of energy efficiency inevitably lead to two major problems. First, those householders who can afford to achieve warmth in their inefficient homes do so by consuming large amounts of energy. The domestic sector in fact accounts for 30% of final energy use in the UK; second only to transport (see figure 2-1). Since less than 1% of primary energy in the UK is generated using renewable resources (DTI 2002a:9), the majority of energy consumed in the home results in the emission of the greenhouse gas, carbon dioxide (CO₂).

Second, those householders who cannot afford to pay the disproportionately high energy bills due to their inefficient homes are simply unable to keep warm. This situation leads to a state termed 'fuel poverty', which is officially recognised to affect around 3 million households in the UK (DEFRA and DETR 2003:19).

¹ The Standard Assessment Procedure (SAP) is the official government system for measuring the energy efficiency of dwellings in the UK. There are three other accredited systems: the National Home Energy Rating (NHER) profile, the Building Energy Performance Index (BEPI) Profile and the Carbon Dioxide Profile. The SAP rating system provides a measure of energy efficiency by estimating the annual fuel costs for space heating and hot water. This calculation is based on the estimated heat loss resulting from the form of the dwelling, the thermal properties of its fabric, potential for solar gain and the level of ventilation.

Although the building regulations impose relatively high standards of energy efficiency in new-build dwellings², it is estimated that less than one tenth of 1% of the existing stock is demolished each year (DETR 1998). While the rate of replacement remains low, it is evident that new dwellings will have little impact on the energy efficiency level of the stock as a whole. The only available course of action to significantly improve domestic sector energy efficiency is, therefore, to make improvements to the existing stock.

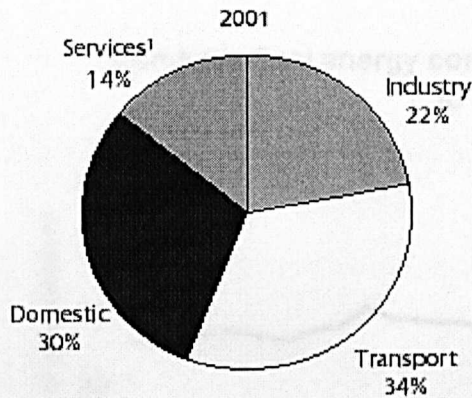


Figure 2-1: Percentage sector shares in total energy consumption, 2001.

Source: (DTI 2002a:11)

On average, 82% of energy used in the English home is consumed for space and water heating (DTI 2002a:11) (see figure 2-2). A household's total energy consumption is, therefore, largely related to the efficiency of its heating system and levels of insulation and draughtproofing (see Shorrock and Walters 1998). It follows then, that the effective refurbishment of dwellings for energy efficiency relies on improvements in these key areas. Numerous publications testify to the fact that the technical know-how exists to make these improvements (See for example, BRECSU and ESTU 1999a; BRECSU and ESTU 1999b; BRECSU and ESTU 1999c). In fact, energy efficiency improvements in the domestic stock have made a positive impact on energy consumption since 1970 (see figure 2-3): it has been calculated that without these improvements, consumption would have been 59% higher by 2000. However, opportunities to make much greater improvements to energy efficiency remain. In the year 2000:

² And since 2002 energy efficiency standards also apply for replacement windows and boilers in existing properties (see Part L of the building regulations)

- only 11% of potential households had full insulation (DTI 2001a) (see figure 2-4);
- only 28% of dwellings with cavity walls had some form of cavity wall insulation (DTI 2002b:57);
- 9% of homes with lofts had no loft insulation;
- and 61% of all homes had less than 80% of their windows double-glazed, despite the apparent popularity of double-glazing (DTI 2002a:28).

Domestic final energy consumption by end use, 1970 to 2000

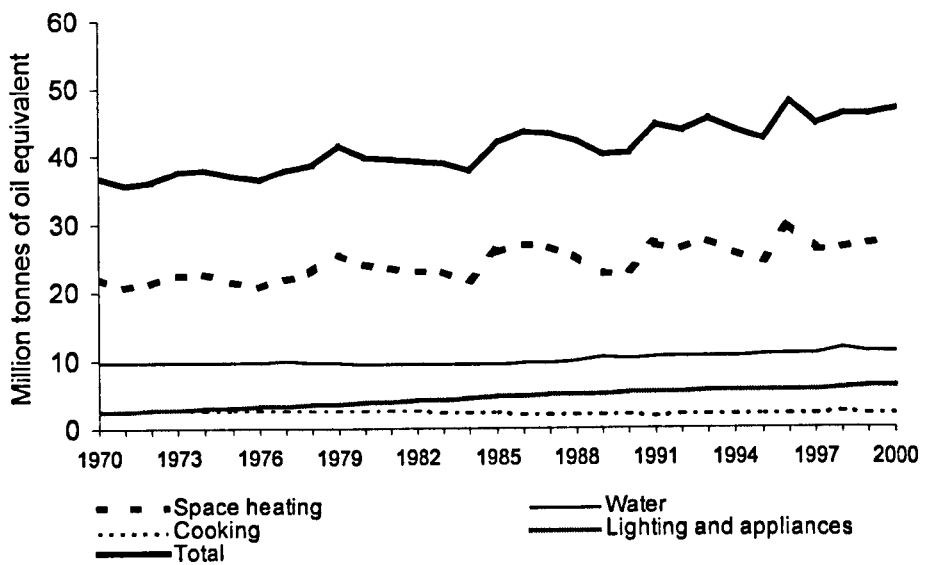


Figure 2-2: Domestic final energy consumption by end use, 1970-2000

Savings due to better insulation and heating efficiency

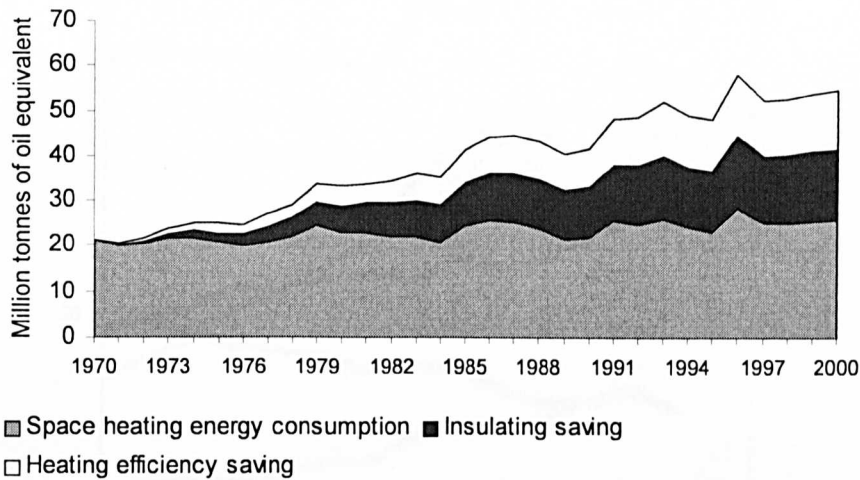


Figure 2-3: Savings due to better insulation and heating efficiency

Consultants to the Royal Commission on Environmental Pollution³ reviewed three studies into the potential for saving energy in the UK's existing housing stock (cited in RCEP 2000:6.65). The studies estimated possible reductions in energy consumption of between 25 and 34%, to be achieved through available energy saving equipment and techniques. Improved wall insulation and high efficiency central heating boilers would account for most of the reduction. Smaller savings would result from efficient electrical appliances, insulation of lofts and hot water cylinders, compact fluorescent lighting, double glazing with low emissivity glass, improved heating controls and draught proofing. What is more, these energy efficiency improvements were estimated to offer the householder economic savings, ranging from 17% of current consumption (in the short term) to 34% (over 20 to 30 years), as a result of reduced fuel bills.

³ Jonathan Fisher Environmental Economics (1998)

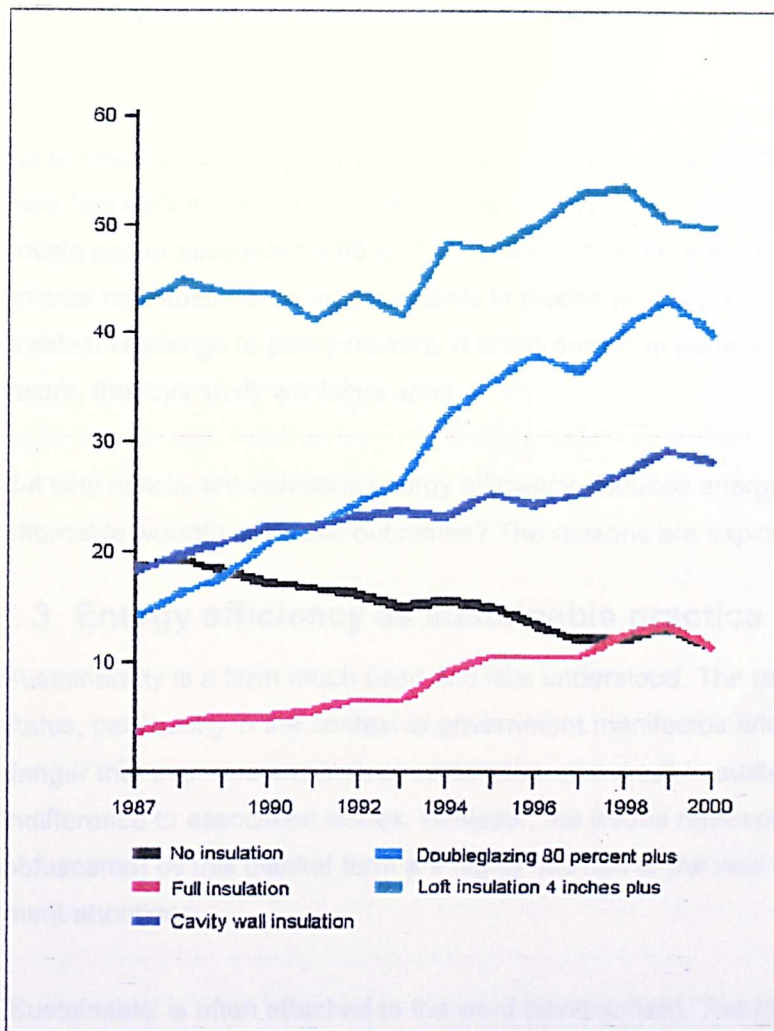


Figure 2-4: Thermal efficiency of the housing stock, 1987 to 2000.

These studies show that there is potential to significantly improve energy efficiency levels in the UK housing stock, thus increasing the average UK SAP rating; potentially reducing domestic energy consumption and increasing the capacity of low-income households to afford warmth. The technical expertise exists to enable these improvements to be carried out and there exists an additional opportunity for householders to make economic savings. However, success rests on more than technical know-how; it also demands political support. Under the Home Energy Conservation Act (HECA) 1995, Energy Conservation Authorities (in effect Local Authorities) were expected to make a 30% improvement in energy efficiency in homes by 2010. However, progress has been slow, with just one in four Authorities in England achieving the rate of improvement required by the end of March 2002 to be on track to

achieve the targets nationally⁴ (ODPM 2003a). Those improvements that have been made have largely occurred within the public stock where certain Local Authorities have had both the will and the resources to carry out necessary works. However, the private sector accounts for 80% of the stock. While there exists no legislation to enforce retrospective energy standards in dwellings, it is this sector that presents the greatest challenge to policy makers. It is this sector, in particular, the owner-occupied sector, that this study will focus upon.

But why exactly are domestic energy efficiency, reduced energy consumption and affordable warmth desirable outcomes? The reasons are explored below.

2.3 Energy efficiency as sustainable practice

Sustainability is a term much used and little understood. The term has 'buzzword' status, particularly in the context of government manifestos and policy and there is a danger that over-use and lack of explanation can result in sustainability fatigue and indifference to associated issues. However, the issues represented (and potentially obfuscated) by this blanket term are highly relevant to the way we live and certainly merit attention.

'Sustainable' is often attached to the word development. The term sustainable development was popularised by the Brundtland Commission in 1987 in the report, *Our Common Future* (World Commission on Environment and Development 1987). According to the commission, sustainable development is that which 'meets the needs of the present without compromising the ability of future generations to meet their own needs.' (Ibid:43) Putting aside the question of what exactly constitutes 'needs', this hardly seems a controversial basis for future development. However, the commission also made the assumption that in order to achieve this goal, more rapid economic growth was required in both industrial and developing countries (cited in Orr 1992:23). The latter assumption is a reflection of what commentator David Orr calls a 'technological sustainability': the view that established practices can essentially continue in their current form, any problems being solved along the way by advances in technology or market solutions (Ibid:24). The alternative sustainability, as defined by Orr, is the ecological version. The quest of ecological sustainability is, rather, to find

⁴ Reported figures showed that 99 of the 354 energy conservation authorities had achieved at least a 12% improvement by 2002, as required to be on track to reach the 30% reduction target.

alternatives to the practices that generated the problems in the first place. According to Orr, by including the word sustainability and supporting economic growth, the Brundtland Commission fell between the two versions of sustainability, politely appeasing both sides of the debate (Ibid: 23).

The author of this study ultimately advocates the ecological version of sustainability. However, she believes that elements of the technological view must be embraced in order to make the first steps in UK society's transition to the ecological worldview. As Orr puts it:

'...I consider both to be necessary parts of a sustainable world. To use a medical analogy, the vital signs of the heart attack victim must be stabilized first or all else is moot. Afterward comes the longer-term process of dealing with the causes of the trauma which have to do with diet and lifestyle. If these are not corrected, however, the patient's long-term prospects are bleak.' (Orr 1992: 24)

The current UK Government appears to have taken a similarly middle-of-the-road view. In the annual report, *Achieving a better quality of life: Review of progress towards sustainable development*, the Department of Environment Food and Rural Affairs (DEFRA) adapts the Brundtland definition, saying that, at the heart of sustainable development is the simple idea of 'ensuring a better quality of life for everyone, now and for generations to come.' (DEFRA 2002a) According to DEFRA, four objectives must be met to achieve sustainable development:

- 'social progress which recognises the needs of everyone;
- effective protection of the environment;
- prudent use of natural resources; and
- maintenance of high and stable levels of economic growth and employment.'

(Ibid:13)

Energy efficiency has been described by the Performance Innovation Unit (PIU) as having the closest match with all the major sustainable development objectives (PIU 2002). It can assist the economy as well as help to achieve social and environmental goals. The following paragraphs give an outline explanation for this view in the specific context of domestic energy efficiency.

The first objective of sustainable development suggests the need for good quality environments for all. In particular, DEFRA specifies a need to '...reduce the harm to health caused by poverty, poor housing, unemployment and pollution'. A low level of energy efficiency is one of the key factors to contribute to poor housing which can in turn contribute to ill-health (see section 2.5). An efficient domestic stock therefore becomes desirable in this light.

Of key concern to the second objective is the issue of climate change. According to DEFRA we must act to limit the global threat presented by climate change. The predictions of the Intergovernmental Panel on Climate Change (IPCC), outlined below (see section 2.4), indicate that, in order to limit this threat, there is a need to reduce the consumption of energy produced as a result of burning fossil fuels. Since domestic energy efficiency offers a means to reduce the energy consumed for the operation of dwellings, it is highly relevant to the objective of limiting climate change and hence protecting the environment.

Clearly domestic energy efficiency is not in itself a means to encourage prudent use of the non-renewable resources used in building products and materials. However, in relation to this third objective, it is highlighted that fossil fuels are themselves natural resources and hence 'prudent use' should be considered in this context.

The fourth objective relates to economic growth and employment. The energy efficient refurbishment of dwellings nationally along with the initiatives associated with these efforts, offer an opportunity to create jobs (see for example EST 2001a:12). A study by the National Audit Office has shown that existing initiatives do in fact benefit the national economy (National Audit Office 1998). Similarly, there is industrial potential in the development of alternative energy efficient technologies.

This preliminary examination makes clear that domestic energy efficiency can indeed play a role in meeting the social, environmental and economic goals set out by DEFRA's vision of sustainable development. However, it is primarily the areas of social progress and environmental protection that drive current efforts to improve domestic energy efficiency in the UK. Of particular concern are the implications of energy inefficiency in the areas of climate change and the health and well-being of

householders. In sections 2.4 and 2.5 these issues are explained in more detail and the potential to alleviate associated problems, through domestic energy efficiency, is examined.

2.4 Climate change

2.4.1 The greenhouse effect and human energy use

The earth's climate has been in a constant state of flux during its history, warming up and cooling down in succession. Analysis of ice cores in the 1980s enabled scientists to identify a significant association between these temperature changes and fluctuations in the prevalence of atmospheric CO₂ over a 160,000 year period (Barnola, Raynaus et al. 1987) (see figure 2-5). As one of the most important naturally occurring greenhouse gases⁵, the relationship between CO₂ and the earth's temperature is well-known (see IPCC 2001). In fact, many natural events can cause the kind of changeability in levels of CO₂ and in temperature that was mapped by the scientists (see Smith 2001:5,6). However, the discovery that contemporary concentrations of CO₂ were higher than ever before in the 160,000-year period suggested that the causes were no longer natural.

Although water vapour is the *most* significant of the naturally occurring greenhouse gases, direct human impact on associated atmospheric levels are negligible. Human activity does, however, directly contribute to levels of CO₂ and methane. A great deal of further research has been carried out since the work of Barnola, Raynaus et al. was published and global CO₂ emissions have continued to rise⁶. Some scientists continue to argue that the present trend towards warming is simply part of a natural climate cycle. Indeed, the Earth's current orbital configuration does suggest that we may be somewhere near the beginning of a warm interglacial period similar to that experienced 400,000 years ago (Smith, Opcit :5). However, the unprecedented level of CO₂ in the atmosphere along with an increasing occurrence of unusual climatic events has led to widespread consensus among high profile researchers that human activity is the cause of these phenomena (IPCC 2001b). CO₂ is estimated, on a global basis, to be responsible for 83% of the current enhancement in the greenhouse effect by

⁵ The United Nations Framework Convention on Climate Change defines greenhouse gases as 'those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and re-emit infrared radiation'. (UN 1992)

⁶ in 2000 growing by 0.4% a year on average (RCEP 2000).

anthropogenic greenhouse gas emissions (Ibid), with approximately four-fifths of the extra CO₂ entering the atmosphere since 1750 estimated to have come from burning fossil fuels (Rotty and Marland 1986).

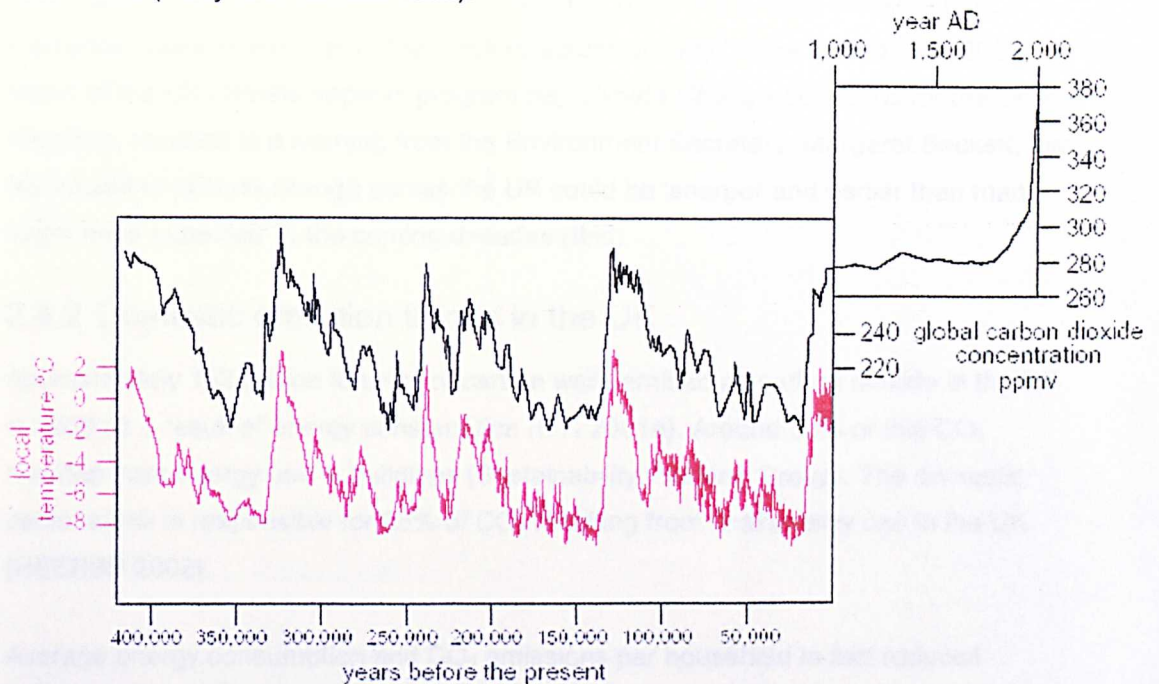


Figure 2-5: Carbon dioxide concentration and temperature: evidence from ice cores

(Source: RCEP 2000:2.14)

The Royal Commission on Environmental Pollution concludes:

'Human use of energy has grown enormously, based overwhelmingly on burning fossil fuels. This is causing a significant change in the composition of the atmosphere which, unless halted, is likely to have very serious consequences.'
(RCEP Op cit:13)

According to the IPCC, the potential impacts of climate change on key resources such as land, ecosystems, and particularly water will be significant: 'Even in prosperous Europe, adverse climate change impacts may aggravate equity issues.' (IPCC 2001:13.4.1) In the UK, a rise in sea levels and storm surges is predicted to threaten 50% of the country's grade 1 agricultural land (Smith, Op cit:11). Seasonal malaria is predicted to spread to southern Britain and 3000 deaths are expected annually from heatstroke (Department of Health 2001 cited in Smith op cit).-By the 2080s the average temperature across the UK could rise between 2 and 3.5 degrees, with a possible 5

degree increase predicted in the south east during the summer (UK Climate Impacts Programme 2002:2). There will be increased risk of droughts, heavy rainfall and floods, with major consequences for 'land use, planning, water resources, infrastructure, insurance, tourism and many other sectors across society.' (NEA 2002b) The 2002 report of the UK Climate impacts programme, *Climate Change Scenarios for the United Kingdom*, resulted in a warning from the Environment Secretary, Margaret Beckett, that the impact of climate change across the UK could be 'sharper and earlier than many might have expected' in the coming decades (Ibid).

2.4.2 Domestic emission trends in the UK

Approximately 152 million tonnes⁷ of carbon were emitted as carbon dioxide in the UK in 2000 as a result of energy consumption (DTI 2001a). Around 50% of this CO₂ resulted from energy use in buildings (Sustainability Working Group). The domestic sector alone is responsible for 28% of CO₂ resulting from final energy use in the UK (HEEBBP 2002).

Average energy consumption and CO₂ emissions per household in fact reduced between 1990 and 2001. The latter can be partly attributed to the reduction in the average number of people in each household and partly to increases in energy efficiency levels in the stock as a whole (see figure 2-6). However, this reduction was outweighed by an increase in household numbers (10% since 1990), resulting in an overall increase in emissions of 11% and a 16.5% increase in energy consumption (Winther, Mangat et al. 2002). In England, the trend for increased numbers of households is projected to continue, reaching 24 million households in 2021 (DETR 2000a). On this basis, domestic energy consumption is set to also continue to rise.

While CO₂ emissions have thus far managed not to rise at the same rate as energy consumption, this has been largely due to primary fuel changes in the electricity supply sector and an increase in use of gas in preference to other less efficient fuels in the dwellings themselves. Once the opportunity for these kinds of fuel changes has been saturated, CO₂ emissions might be expected to rise more rapidly.

⁷ This is on an IPPC basis. The DTI also quotes 148 million, calculated on a UNECE basis.

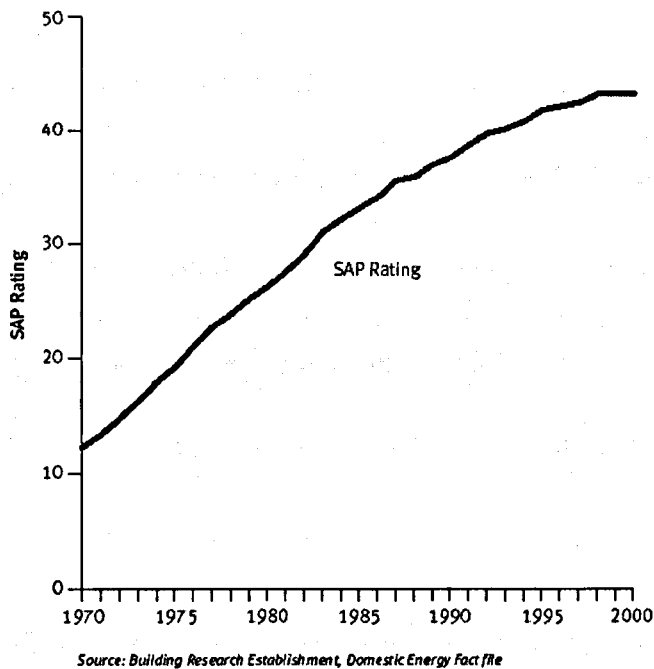


Figure 2-6: SAP rating of housing stock 1970 - 2000

2.4.3 Agreements and recommendations

Global climate change has been the catalyst for two international agreements to reduce emissions of CO₂ and other greenhouse gases. In 1992 at the Rio De Janeiro Earth Summit, the UN Framework Convention on Climate Change set a target to cut greenhouse gas emissions to 1990 levels by 2000. The UK is one of the few OECD countries to have met this target. In 1998, as a result of the Kyoto Protocol (1997), it was agreed that the UK's next target should be to cut greenhouse gas emissions⁸ by 12.5% below 1990 levels by 2008 - 2012. It was intended that, for the first time, the emissions targets would be legally binding, however, no such agreement was reached at the 2002 Johannesburg World Summit on Sustainable Development.⁹

⁸ In 1999 CO₂ accounted for 84% of total UK greenhouse emissions with methane and nitrous oxide contributing around 8% and 7% respectively (Energy sector indicators, DTI). Of the three remaining, HFC contributed about 1% and PFC and SF₆ a total of 0.3%.

⁹ The United States – the largest polluter by absolute volume - has withdrawn its support of the agreement, and there are concerns that Australia - the largest per capita polluter in terms of carbon dioxide emissions - will follow suit, following the announcement of the Australia/US Climate Action Partnership in February 2002 (People and Planet 2002).

Research suggests that far more challenging targets are in fact needed if climate change trends are to be stabilised. Both the IPCC and the Royal Commission on Environmental Pollution (RCEP) have concluded that CO₂ emissions in the atmosphere must ultimately be limited to 550 parts per million by volume (RCEP 2000; IPCC 2001). The RCEP, reviewing energy prospects for the 21st century and their environmental implications, suggests that for the UK this implies a 60% reduction in 2000 level emissions by 2050 and an 80% reduction by 2100. The 'effective adaptation and policy development' is clearly required on a global scale to ensure that consequences such as those outlined above are avoided.

2.5 Health, well-being and energy efficiency

2.5.1 Introduction

Links between health and housing quality have long been presumed and there exists a large body of research investigating the nature of these links. Ambrose, Barlow et al, (1996) provide a comprehensive review of relevant literature. They discovered that many studies 'showed clear patterns of association between poor conditions – for example cold, damp, infestation, noise, poor air quality and overcrowding – and an increased incidence of ill-health.' (Ambrose 2002:2) However, the complexity of the health/housing relationship and an inevitable omission of control groups for relevant studies, has resulted in a lack of convincing evidence for a causal relationship (Phibbs 2000; Ambrose 2002).

The English House Condition Survey, 1996 energy report (DETR 2000b) similarly acknowledges a strong correlation between mould growth and a variety of respiratory ailments (including asthma, allergic rhinitis and eczema), but points out that this does not necessarily prove a direct causal link. This report does, however, make the broad acknowledgement that cold homes represent the primary health risk associated directly with the condition of the housing stock. This association between cold homes and health is the main factor driving efforts by campaigners, and more recently the Government, to eliminate fuel poverty.

2.5.2 Fuel poverty

Fuel poverty indicates an inability to afford sufficient warmth for comfort and for good health. It results from a combination of factors including: low household income; poor

quality housing (including low levels of insulation); inefficient and expensive heating systems; and in the case of many vulnerable households, it is also associated with the increased demand for warmth (Source: NEA).

Cold conditions are related to a number of illnesses including respiratory disease. It is these cold-related illnesses and their effect on winter mortality statistics that National Energy Action¹⁰ (NEA) consider to lie at the heart of the fuel poverty problem. While death rates in the UK resulting directly from hypothermia are relatively low, many more householders are put at risk from the other illnesses caused by cold conditions.

Winter mortality figures reflect clearly the threat. Table 2-1 shows the number of excess deaths over the winter months (December, January, February, March) as compared with the average number over the preceding and succeeding four months. This excess mortality rate is positively correlated with the severity of the winter. Research suggests that for every 1°C that the temperature drops below the winter average there will be an associated increase of 8000 excess winter deaths (Curwen and Devis 1988).

While there is no direct evidence that poor housing is the cause of cold-related illness and excess mortality rates, NEA points to the fact that other countries with similarly cold winters do not experience such high rates of excess winter deaths (see table 2-2). This, they propose, suggests that poor housing standards and comparatively low incomes are the crucial factors (NEA 2002c).

¹⁰ The primary national charity which works to alleviate fuel poverty

| Excess Winter Deaths (England) | |
|--------------------------------|---------------|
| Year | Excess Deaths |
| 1992-93 | 24,190 |
| 1993-94 | 25,030 |
| 1994-95 | 25,760 |
| 1995-96 | 37,810 |
| 1996-97 | 44,850 |
| 1997-98 | 23,220 |
| 1998-99 | 45,240 |

Table 2-1: Excess winter deaths (England)

| Excess Winter Deaths - %Winter over Summer | | | |
|--|--------|--------|---------|
| Great Britain | Sweden | Norway | Germany |
| 31% | 14% | 10% | 12% |

Table 2-2: Excess winter deaths - % winter over summer

A fuel poor household is officially defined as one that needs to spend more than 10% of its income on fuel to maintain a satisfactory heating regime. Two different heating standards are used in assessing the energy needs of a home, the higher standard seeking to achieve full thermal comfort the lower standard seeking to maintain health. For a living room these are 18°C & 21°C; for other heated rooms, 16° & 18°C¹¹. The definition of 'income' currently depends upon the context in which it is read, with some parties including and others excluding Housing Benefit and Income Support for rent and mortgage interest payments. Including the latter in its definition, the Government modelled the effects of reduced fuel prices to arrive at a figure of 3.3 million fuel poor households in England in 1998 (DTI 2001a:58). This represents more than 1 in 6 households, with over 1 in 30 households classed as being in severe fuel poverty¹². More recently, the Government estimated that the number of fuel poor in England fell

¹¹ Source: NEA

¹² i.e. households which need to spend over 20% of total expenditure on fuel to keep warm (DTI 2001b:58)

by half 1.5 million households between 1998 and 2001 when changes in income, fuel prices and energy efficiency improvements were considered. (See figure 2-7)

| Fuel poor households in England (millions) – Income including housing benefit and ISMI (Income not including Housing Benefit and ISMI) | | | | |
|---|-----------|-----------|---------------------|---------------------|
| | 1996 | 1998 | 2001 ⁽¹⁾ | 2001 ⁽²⁾ |
| Total Fuel Poor | 4.3 (5.3) | 3.3 (4.5) | 1.8 (2.4) | 1.7 (2.3) |
| Vulnerable | 3.0 (3.7) | 2.7 (3.7) | 1.5 (2.0) | 1.4 (2.0) |
| Non-Vulnerable | 1.3 (1.5) | 0.5 (0.8) | 0.3 (0.4) | 0.3 (0.3) |
| Social housing | 1.4 (2.2) | 1.0 (1.7) | 0.3 (0.8) | 0.3 (0.8) |
| Private housing | 2.9 (3.1) | 2.3 (2.7) | 1.4 (1.6) | 1.3 (1.5) |

Figure 2-7 Number of vulnerable fuel poor households in England (millions) (From DEFRA and DETR 2003:21)

- (1) Estimates based on previous method for estimating income of total household and non-heating use of fuels (1996 BREDEM).
- (2) Provisional estimates based on actual data collected in EHCS for total household income, and updated method for non-heating use of fuels (2001 BREDEM). These do not yet take account of Council Tax Benefit.

Unsurprisingly, the average SAP rating of dwellings decreases as the severity of fuel poverty increases. This indicates that, not only are fuel poor households likely to have a low level of income, but they also tend to live in houses with inadequate insulation and/or less efficient heating systems than others (DTI 2001a: fuel poverty). In fact, the poorest fifth of households are twice as likely to live in the least efficient housing as the richest fifth (DETR 2000b). Those households with homes of SAP 20 or less, tend to:

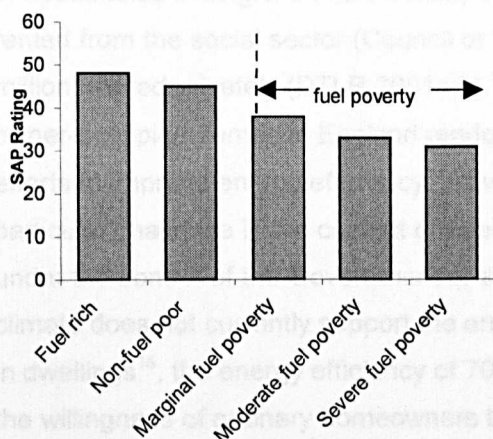
- live alone (38% do so);
- be elderly and vulnerable to illness (15% are aged 75 years or more);
- be elderly and dependent on heating all-day (35% are so);
- be long-term residents (30% have been resident 20 years or more);
- have low-incomes (27% are in the bottom fifth of incomes);
- be unemployed if younger (13% of the heads of household are); and
- suffer ill health (54% report health problems).

(DETR 2000b)

A reliance on raising fuel prices is clearly an unsustainable strategy for the eradication of fuel poverty, especially in the light of long-term progress for non-renewable fossil fuels. Only by increasing a household's disposable income and by reducing the need to

Figure 2-8 relates to 1998 and shows that the average SAP rating for all households in England was 45 compared to 31 for those in severe fuel poverty (DTI 2001a: fuel poverty).

Figure 2-8: Energy efficiency by fuel poverty group (1), measured using the SAP (2), 1998, England



Fuel rich groups are defined as follows:

| Fuel poverty group | Required fuel expenditure as a percentage of total |
|-----------------------|--|
| Fuel rich | <5 |
| Non-fuel poor | 5-10 |
| Marginal fuel poverty | 10-15 |
| Moderate fuel poverty | 15-20 |
| Severe fuel poverty | >20 |

(2) The Standard Assessment Procedure (SAP) is an energy efficiency measure

Source: DEFRA

Even meeting the minimum accepted heating standard is beyond many households and yet, many people (such as the elderly) require the higher standard to ensure health and comfort. Elderly households in fact account for over half of the fuel poor (DETR 2000b). The number of homes failing to reach a minimum level to safeguard health was 38% in 1996.

A reliance on falling fuel prices is clearly an unsustainable strategy for the eradication of fuel poverty, especially in the light of long-term prospects for non-renewable fossil fuels. Only by increasing a household's *disposable* income and by reducing the need to

spend money on fuel, will fuel poverty be beaten. The only realistic means to achieve the latter is to increase the energy efficiency of the homes in which the fuel poor households live¹³.

2.6 The owner-occupied housing stock

The UK's housing stock is unusual in its high level of homeownership. In 2000/01 70% of households in England (14.4 million) owned their own home, while 20% (4.2 million) rented from the social sector (Council or Registered Social Landlord) and 10% (2.0 million) rented privately (DTLR 2001c:9).¹⁴ (See figure 2-9) The sheer number of owner-occupied homes in England renders this an important area on which to focus efforts to improve energy efficiency. However, private sector homes present a particular challenge in the context of energy efficiency, simply because they are not under the control of the Government or a social housing provider. Since the political climate does not currently support the enforcement of retrospective energy standards in dwellings¹⁵, the energy efficiency of 70% of the housing stock inevitably depends on the willingness of ordinary homeowners to engage in energy efficient home improvement.

Owner-occupied homes tend to use more energy than rented homes. In 1998, the average owner-occupied home in Great Britain used 86.7 GJ compared to 62.6 GJ, 58.5 GJ and 53.6 GJ used in Local Authority, private rented and registered social landlord homes respectively (Utley, Shorrock et al. 2001). 75% of the CO₂ emitted from the housing stock comes from the owner-occupied stock.¹⁶ (DETR 2000b). It has been estimated that it would cost £39 billion to achieve a 20% saving in domestic CO₂ emissions in England through the installation of energy efficiency measures¹⁷, most of which (£30.6 billion) would be required in the owner-occupied sector, at an average cost of £2,265 per dwelling (DETR 2000b). The owner-occupied sector clearly offers the greatest potential to achieve domestic CO₂ savings through increased energy efficiency. On grounds of climate change, this is good reason to focus attention on this sector.

¹³ and in certain cases to tackle under occupancy

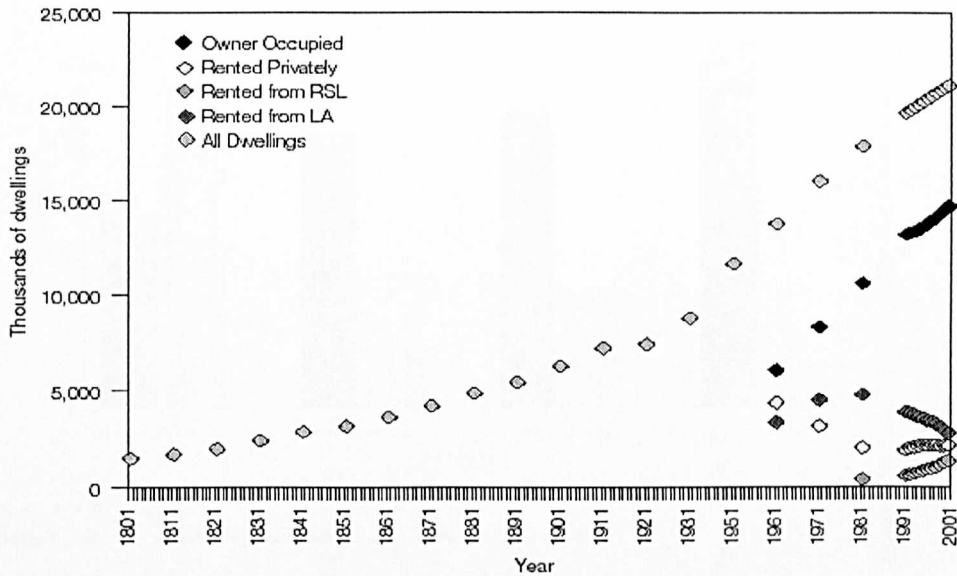
¹⁴ In 1996 homeownership levels in Germany and the USA were 38% and 64% respectively.

¹⁵ Since 2002, Part L has, however, set standards for replacement windows and central heating/ hot water boilers.

¹⁶ despite the fact that the average SAP rating is slightly higher than that for other sectors -SAP 44.6 as compared with 43.8 for all households in 1996.

¹⁷ On the basis of 1996 figures

1b Stock of dwellings by tenure:
England 1801 – 2001



Source: Table 1.6b

Figure 2-9: Stock of dwellings by tenure, England 1801-2001.

Health and well-being are also of key concern within the owner-occupied stock. Over half the homes found to be suffering mould growth in the 1996 English House Condition Survey were owner-occupied¹⁸. Although the highest concentration of fuel poverty is to be found in the Registered Social Landlord sector (RSL), in terms of overall numbers, most fuel poor households (60%) are owner-occupiers¹⁹ (DETR 2001a). (See figure 2-10.)

¹⁸ although severe outbreaks are still more frequent in the private rented stock
¹⁹ Figures based on data from the 1998 Energy Follow Up Survey (EFUS)

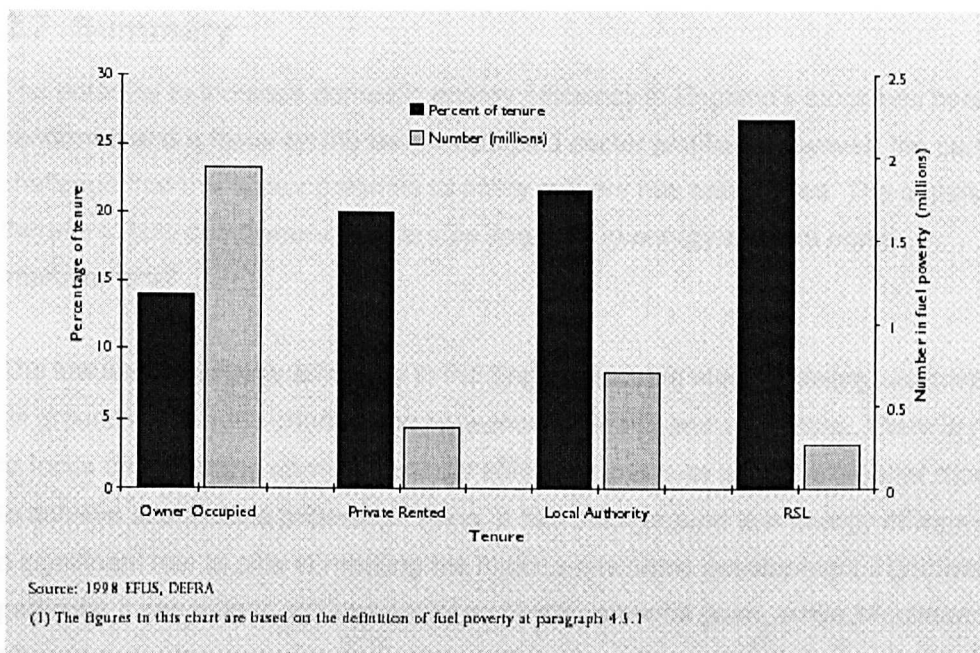


Figure 2-10: Number and percentages in fuel poverty by tenure in England, 1998.

Between 1991 and 1996, of all tenure types, least progress was made in terms of energy rating among owner-occupiers. Despite energy-related work, to a value of £5.5 billion (DETR 2000b), the most common improvements tended to be installing double-glazing, servicing heaters or boilers and work on open or electric fires, rather than the installation of more energy efficient insulation and heating measures. This once again reflects the challenge presented by this sector, while at the same time underlining the potential that remains to achieve significant improvements. Those households least likely to carry out energy related work included those households living in the oldest, most poorly heated and least efficient homes (See table 2-3).

| Most likely to carry out energy work | Least likely to carry out energy work |
|--|---|
| Couples under 60 years without dependent children (44.7%) | Households composed of one person, irrespective of age (27.3%) |
| Households resident for 2 to 4 years (42.9%) | Households resident less than 1 year (27.4%) |
| Households with incomes above the median for owner occupiers (approximately £15,000) (41.9%) | Households from ethnic minorities (30.5%) |
| Households resident 20-29 years (41.4%) | Households with incomes in the bottom quartile for owner occupiers (approximately £9,000) (30.7%) |
| Households with heads aged from 45 to 64 (41.1%) | Lone parents (30.9%) |

Table 2-3: Type of household most and least likely to carry out energy work

Source: 1999/00 Survey of English Housing: preliminary results (DTLR 2001a)

2.7 Summary

The potential to increase domestic energy efficiency in England's stock has been confirmed and a focus on the owner-occupied sector justified. However, the particular challenge that this sector presents to policy makers has been noted. The question is, therefore: *how* can owner-occupiers be engaged in energy efficient home improvement?

The low level of energy efficiency in the English housing stock is clearly unacceptable on grounds of climate change and householder health and well-being. There is a need to focus on improving domestic energy efficiency levels as part of a broader movement to achieve sustainable patterns of living. It has been argued that energy efficiency has a significant role to play in meeting the major sustainable development objectives. In particular it can help to achieve social and environmental goals, while simultaneously offering economic opportunities. While both energy demand and energy supply issues are key, it is emphasised that 'minimising demand for energy must be the first principle of a sustainable energy policy.'(EST 2001a:1)

It has been shown that the domestic sector offers great potential for improved energy-efficiency (RCEP 2000 for a review of relevant studies; Select Committee on Environment 2000). In fact, the Parliamentary Select Committee on Environmental Affairs suggested that this sector should have been made more of a focus in the UK climate change strategy, since this potential for improvement risks being under-exploited (Select Committee on Environment Transport and Regional Affairs 2000). In particular, this chapter has argued that a focus on the owner-occupied stock is justified. The need to improve energy efficiency is particularly acute in this area due to the relative volume of CO₂ emitted and due to the relative number of fuel poor households who are owner-occupiers.

Perhaps more important is the identification of the particular challenge for policy makers presented by the owner-occupied sector. Since there exist no grounds for compelling homeowners to engage in energy efficient home improvement, initiatives that seek to improve energy efficiency levels in the owner-occupied sector must rely on householder support. This calls for initiatives which not only have the capability to increase energy efficiency levels through physical improvements, but which can also

attract this support. The question therefore remains: How can owner-occupiers be engaged in energy efficient home improvement?

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3. Methodology

3.1 Chapter summary

The following pages describe the methodological approach taken in carrying out the empirical study and its relationship to the literature. Each stage in the research is outlined, with a focus on the three principal data gathering phases.

3.2 Research development

For the purpose of this study, the methodology is 'a way of thinking about and studying social reality' and ultimately, 'a way of gathering knowledge about the social world' (Strauss and Corbin 1998:4). The views and expectations of the involved actors – energy advisors and homeowners– are considered to be highly relevant to the research question. The study attempts to create a meaningful picture of the investigated scenario from the perspective of the actors. The emphasis therefore lies on *understanding* human behaviour (rather than providing an explanation) and hence this research builds on the interpretivist tradition (and its intellectual influences, hermeneutics and phenomenology) rather than the positivist. Where the research does attempt to provide causal explanations, this is done with reference to *interpretive* understanding.

Underlying this position is a belief in constructionism, that is, that 'social entities... can and should be considered social constructions built up from the perceptions and actions of social actors.' (Bryman 2001:16) However, the author also acknowledges that, while individuals have an active role in the construction of their social reality, there also exist orders, such as culture and organisations, which can influence those social actors by acting as a point of reference for their behaviour.

The stated epistemological and ontological position of the researcher might suggest a qualitative approach to the research. However, the researcher takes the technical rather than the epistemological view and hence she perceives the research *methods* as being autonomous. The epistemological and ontological assumptions of the quantitative and qualitative approaches are recognised, however, the researcher places greater emphasis on the strengths of the data analysis and collection techniques with which each is associated. On this basis, the qualitative and quantitative methods can, where appropriate, be usefully combined, as they are here, in a multi-strategy research plan (term borrowed from Layder 1993 - cited in Bryman 2001:444)

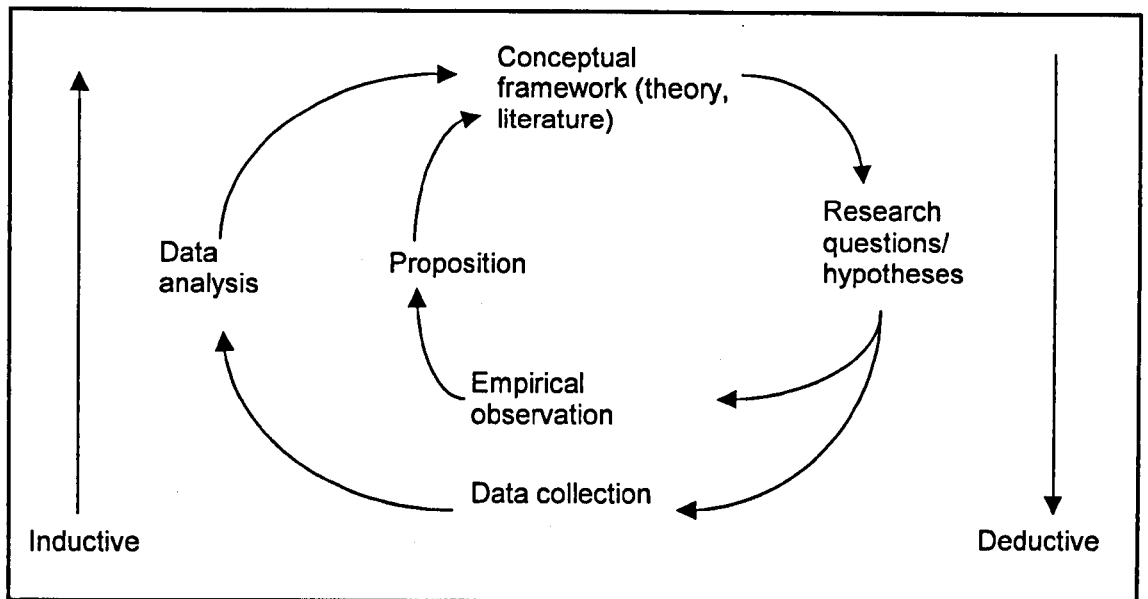


Figure 3-1: The Research Wheel

(Source: Rudestam & Newton, 1992)

Being both qualitative and quantitative, this study is both inductive and deductive. It is both guided by and also aims for middle range theories in as much as these theories attempt 'to understand and explain a limited aspect of social life' (cited in Bryman 2001:6). These theories operate in a limited domain, falling between grand theories and empirical findings. The research process adopted is therefore iterative, i.e. the data collection and analysis proceed in tandem, repeatedly referring back to each other (Ibid:390). To further explain this process the author draws on The Research Wheel model proposed by Rudestam and Newton (1992) (see figure 3-1). Rather than being linear, this process involves 'a recursive cycle of steps that are repeated over time' (Ibid).

The research strategy draws some inspiration and techniques from 'grounded-theory' as set out by Strauss and Corbin (1998), however this approach is not followed rigidly. Strauss and Corbin's methodology allows flexibility and creativity in the application of both qualitative and quantitative procedures and techniques, based on an understanding of the underlying principles. However, the authors acknowledge that researchers will also blend the techniques they describe with their own.

Where grounded theory aims to avoid testing hypotheses altogether, the approach taken in this thesis does allow for this kind of testing within the iterative process.

However, it is qualitative data that suggest which hypotheses should be tested by quantitative means. Much of the data generated in this study are qualitative since a great number of open-ended questions have been included in the surveying techniques, allowing people to respond freely. However, the research has in addition generated quantitative data through the use of closed questions.

Many researchers view quantitative and qualitative data collection and analysis methods as complementary (see e.g. Greene, Caracelli & Graham 1989, for a discussion on this topic - cited in Strauss and Corbin 1998:28); the former offering a representative and generalisable picture, the latter adding depth and richness. The combination of the two methods is, therefore, believed to allow the researcher a greater possibility of reaching the 'essence' of a situation. Strauss and Corbin believe that they take this position a step further in the grounded-theory approach, encouraging interplay between qualitative and quantitative techniques and procedures, which can potentially be usefully combined at every research phase:

'The qualitative should direct the quantitative and the quantitative feedback into the qualitative in a circular, but at the same time evolving, process with each method contributing to the theory in ways that only each can.' (Ibid:34)

In this way, theory is allowed to emerge. The researcher does not base the study on pre-established concepts and does not design the study in line with these. Instead, a field of study is chosen and qualitative or quantitative analysis used to allow concepts to 'emerge' from the data. These findings are then fed back into the process and allowed to inform the next stage of data collection and analysis, as shown in the Research Wheel (see figure 3-1). This can be repeated as many times as is necessary to build a theory grounded in the data. The research question, within this methodology, needs to be framed in such a way as to allow for flexibility and freedom in exploration. The question is therefore broad and open at the outset and becomes progressively narrowed and focussed in response to the emerging concepts and discovered relationships (Strauss and Corbin, 1998:41).

While many writers support multi-strategy research, it is acknowledged that this approach is not automatically better than a mono-method approach. A multi-strategy must be appropriate to the research area and its adoption should be justified. This strategy has been taken in this study for reasons of facilitation and complementarity (Hammersley 1996 – cited in Bryman Op cit:445). The decision to pursue a multi-

strategy is based on the following assumptions (see Bryman, 2001:449 for review of possible reasons to adopt and multi-strategy approach):

It allows both the researcher's and the participants' perspectives to be explored

A qualitative strategy allows the researcher to focus attention on meanings as experienced and perceived by the participants. The quantitative strategy, on the other hand, allows the researcher to explore a specific set of issues.

It can overcome the problem of generality

Qualitative research has been criticised for giving little sense of the relative importance of identified themes (Ibid:451). Therefore, in some instances there has been some quantification of the qualitative research findings in order to help identify the generality of the phenomena described. In every case, this quantification aims to reflect the participants' understanding and perspective.

Qualitative research may facilitate the interpretation of the relationship between variables

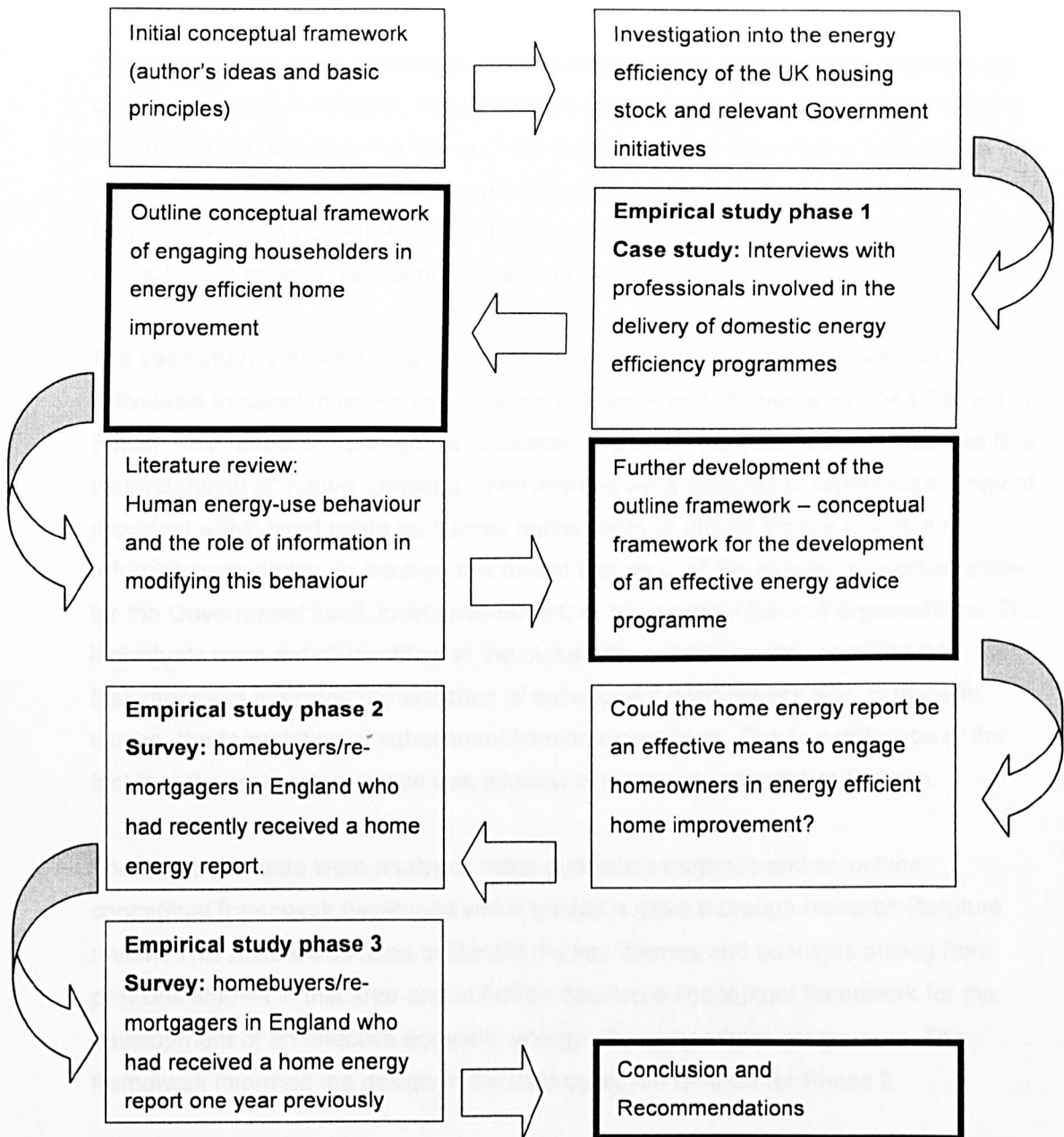
Where a quantitative study might uncover significant relationships between variables, qualitative research allows the researcher to ask why this might be so. Hence qualitative follow-up research can help to identify possible factors influencing the relationship between various variables.

Just as with grounded theory, the approach taken demands critical and creative thinking, in that the researcher needs to be able to 'aptly name categories, ask stimulating questions, make comparisons, and extract an innovative, integrated, realistic scheme from masses of unorganised raw data.' (Strauss and Corbin, Opcit:13)

3.3 Principal phases in the research process

There are three traditional types of research (Robson 1993:40): experimental, survey and case study. This study combines the survey and the case study. The survey is generally used to collect information in a standardised form from groups of people and the case study is used in the development of detailed, intensive knowledge about a single case or a small number of related cases. In this study, both the survey and the case study are used to collect quantitative and qualitative data, although the survey is the primary source of the quantitative and the case study the primary source of the qualitative. The survey, in this case, essentially provides a cross-sectional study, although the follow-up survey uses a small number of the same subjects, and in this sense permits longitudinal study.

The empirical study was carried out in three key phases, including three data collection exercises; one case study and two surveys. The adopted methods are explained in detail in chapters 4 & 7. Figure 3-2 shows the main steps taken in the research process and the primary outputs.



3.3.2 Phase 2

Phase 2 focuses on the home energy report developed by the Government and

allows the gathering of data to answer the research question: How can owner-occupiers in England be engaged in energy efficient home improvement?

3.3.1 Phase 1

Phase one of the empirical study was guided by the initial broad research question for this study:

How can owner-occupiers in England be engaged in energy efficient home improvement?

How can owner-occupiers in England be engaged in energy efficient home improvement?

The researcher's basic knowledge and experience of the research area informed the questions for the first phase. Though there was no thorough literature review prior to the case study, a preliminary survey of literature revealed a scarcity of information on the owner-occupier response to current domestic energy efficiency initiatives in England. Since the broad research question relates specifically to the owner-occupiers of England, it seemed appropriate to explore the latter area.

The case study gathered data by means of 14 semi-structured interviews with individuals involved in delivering domestic refurbishment or energy advice schemes in Britain. This research approach is recommended when the interviewer initially has little understanding of 'native' concepts. Interviewees were selected to represent a range of providers within what might be termed mainstream or official energy advice and refurbishment circles. In practice this meant that most of the individuals worked either for the Government itself, local government, or government-backed organisations. The individuals were not all identified at the outset: the qualitative data resulting from the first interviews informed the selection of subsequent interviewees and, in the later stages, the formulation of subsequent interview questions. This is a reflection of the fact that the research question was allowed to narrow in response to findings.

The qualitative data were analysed using qualitative methods and an outline conceptual framework developed which guided a more thorough research literature review. This review was used to identify the key themes and concepts arising from previous studies in this area and to further develop a conceptual framework for the development of an effective domestic energy efficiency advice programme. This framework informed the design of the data collection method for Phase 2.

3.3.2 Phase 2

Phase 2 focuses on the home energy report initiative proposed by the Government and used in a similar form by certain high street mortgage lenders. English homeowner-occupiers were surveyed by means of a postal questionnaire in order to gather data relating to owner-occupiers and the home energy report. The choice of data collection method was in part pragmatic and in part dictated by circumstances, which would not allow the researcher direct access to participants. However, the postal questionnaire allowed the gathering of both quantitative and qualitative data using techniques such as tick boxes and open-ended questions, respectively. These data were also analysed both quantitatively and qualitatively – each method informing the use of the other at

various stages in the analysis. The findings of this phase were used to design the final phase of data collection.

3.3.3 Phase 3

The final phase involved structured interviews/surveys over the telephone with a selection of the homeowners from Phase 2. Again, both quantitative and qualitative data were gathered and were in turn analysed both quantitatively and qualitatively. These cases provided information about whether or not homeowner intentions had been turned into action, which in turn allowed a more accurate interpretation of Phase 2 results. Further topics and concepts that had emerged from qualitative data in Phases 1 and 2 were also studied in more detail through these cases. In particular, possible ways of making domestic energy efficiency more attractive and accessible to the homeowner were explored.

3.3.4 The use of literature

Professional and disciplinary literature has played a role, not just between phases 1 and 2, but also throughout the process. The approach taken has been primarily theory building – building a theory about the relationship between the English homeowner-occupier and domestic energy efficiency programmes. For this reason, it was not possible (or necessary) to carry out an exhaustive literature review prior to commencing the field research: the research itself identifies the relevant problems and concepts, which then provide the direction for literary investigation along the way¹.

In the course of the iterative data collection and analysis process, literature has been used to aid identification of significant emerging themes and concepts. It has also been used to stimulate questions during analysis, particularly where there are discrepancies between the study findings and the findings in the literature. In the reporting of results and discussion of their meaning, literature is used to support the findings. Conversely, where relevant, the findings are used to illustrate where literature might be questioned.

3.3.5 Outcome

This study is primarily exploratory. The findings of the research have been used to develop a theory about the relationship between the English homeowner-occupier and domestic energy efficiency programmes. This theory, grounded in the data, is used as

¹ It is acknowledged, however, that this is just one methodological approach and is not necessarily better or worse than other approaches in which it is considered more appropriate to carry out a thorough literature review prior to empirical study.

the basis for suggestions about ways in which domestic energy efficiency programmes might be evaluated and also to make suggestions for ways in which programmes of domestic energy efficiency advice, in particular the home energy report, might be made more effective.

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4. Interviews: a provider perspective

4.1 Chapter outline

In this chapter the first phase of the empirical research, a case study, is described. The methods used to collect and analyse the data are described and results are discussed according to the themes that emerged. The chapter ends by presenting an outline conceptual framework of engaging homeowner-occupiers in energy efficient home improvement - 'Getting the message across'.

4.2 Phase 1 method

4.2.1 Background and aim

The researcher's basic knowledge and experience of the research area informed a series of qualitative interviews which were to provide data for a case study. This approach is recommended when the interviewer initially has little understanding of 'native' concepts (Kempton 1991:184). Though there was no thorough literature review prior to the case study, a preliminary survey of literature revealed a scarcity of information on the homeowner response to current domestic energy efficiency initiatives in England. Since the broad research question, as posed in the Introduction (see 1.1), relates specifically to the homeowner-occupiers of England, it seemed appropriate to explore the latter area. This was achieved by selecting interviewees who were at the time involved in the provision of domestic energy efficiency initiatives in England (from here on termed 'providers').

The aim of this case study is to develop an outline theory of engaging homeowner-occupiers in energy efficient home improvement. Further investigation will be guided by this outline theory.

4.2.2 Data collection method

Semi-structured interviews were used to explore the research question. A broad set of concerns was identified, centring on the design and delivery of domestic energy efficiency programmes for the private sector and associated owner-occupier response. These concerns guided the formulation of a series of open-ended questions which formed the interview guide (see appendix A). Questions could be modified to ensure that they were appropriate to each provider's situation and experience and their

sequence could be varied. The flexibility of the guide also allowed the interview to go in the direction that the interviewee wanted to take it. In practice this meant that individuals were encouraged to pursue anecdotes, trains of thought or anything else that might appear to be tangential to the posed questions, in order to provide insight into what the provider might see as relevant and important. Follow-up questions were devised during the interviews, allowing the researcher to clarify understanding and to probe more deeply into raised issues that were perceived to be significant. The interview guide was divided into four subject areas:

- the scope of the energy efficiency programme;
- householder response and levels of motivation;
- methods of implementation; and
- the future.

The first area provided the context for the interview and the fourth area provided the interviewees' own views on what was required to improve the success of the domestic energy efficiency programmes. The second and third subject areas highlighted the factors relevant to the success of these programmes and for this reason the discussion presented in this chapter draws on data relating to these two areas.

The open-ended, discursive nature of the interviews permitted an iterative process of refinement, in which concepts raised by earlier interviewees could be raised with those interviewed later (Beardsworth and Keil 1992:261-2, cited in Bryman 2001:315). This refinement process reflects the fact that the research question was allowed to narrow in response to findings. In practice, the interview questions remained broadly similar, following the same flexible guide, until the final three interviews with representatives from the Department of Environment Transport and the Regions (DETR). These interviews narrowed to focus on relevant government policy, focusing finally on one specific initiative: the home energy report in the seller's pack. All of the interviews were taped and then typed-up verbatim. Data relating to the home energy report is reported in chapter 6.

Participants and sampling

The first five interviewees were independently selected by the researcher and thereafter a snowball sampling technique was employed (Strauss and Corbin 1998:280), whereby the interviewees either directly recommended further interviewees

or the data suggested a direction to take. This theoretical sampling approach is a technique summarised as being concerned with the refinement of ideas rather than boosting sample size (Charmaz 2000:519, cited in Bryman 2001:302). It clearly does not result in a sample that is representative of the population. However, since this stage of the research was qualitative and intended as a means to outline key relevant issues which might inform further research, issues of external validity and an ability to generalise are not of core concern. Strauss & Corbin (Ibid) suggest that 10 good interviews can provide the skeleton of a theoretical structure (following analysis and interpretation). A total of 14 interviews were carried out for this phase of the study, although one interview was not used in its entirety (see note at table 13-1, appendix A).

Each of the participants was involved in the provision of domestic energy advice programmes for England, whether at a hands-on or a more strategic level. The programmes themselves varied, some involving direct domestic energy efficient refurbishment, others focusing entirely on raising awareness and the provision of advice. The providers were selected to represent a range of organisations within what might be termed mainstream or official energy advice and refurbishment circles. Table 13-1 (see appendix A) shows the specific organisations and organisation types represented as well as the types of programmes covered. Organisations were also chosen for their variety in terms of their own size and size of client body, client-type, geographical coverage and in terms of their primary motivation of the programme. The latter variety in the sample was intended to increase the likelihood that there would be differences in the properties of emerging concepts, which, according to Strauss and Corbin (Ibid) enables the researcher to build-in variation to the emerging theory, increasing its explanatory power. The 14 interviews involved 16 individual 'providers' who represented 10 different organisations.

Reliability and validity

The researcher occupies a 'middle-ground' position with regard to the reliability and validity of qualitative research. The accounts gained through the interviews are recognised as one of a number of possible representations rather than as definitive versions of social reality (Bryman opcit:276). The direct application of quantitative notions of reliability and validity to this stage of the research is therefore rejected. Instead the notions of credibility and transferability, as described by Lincoln and Guba (1985, cited in Bryman, 2001:272) are important. These criteria for trustworthiness have been facilitated through a process of interview recording and subsequent

verbatim transcription. The researcher has also strived for dependable and confirmable research (Ibid) and has thus been explicitly self-reflective with regard to personal values (see section 4.2.6).

The fact that all of the interviewees were practitioners in the research field could potentially mean that the individuals have a vested interest in the research question and the subsequent findings. The researcher aims to take this into account when analysing and drawing conclusions from the findings.

4.2.3 Data analysis method

The generated qualitative data have been analysed qualitatively. Hence the emphasis is on words, and their meaning from the perspective of the speaker, rather than on quantification. A post-coding process had been used, based on that used in grounded theory. In the first stage (open coding) the transcribed interview texts are read and re-read by the researcher who labels key words and phrases. In this way the researcher analyses and interprets the content of the interviewee's words, identifying concepts, and relationships between concepts, which evolve into categories. The various properties or characteristics of the categories are identified as more and more data is analysed and reanalysed. During the next stage (axial-coding), connections are made between categories, for example, by making links between their contexts, consequences and causes. Patterns and their variations can then be formulated and anomalies identified. Finally, a core category is selected (selective coding) which is systematically related to all other categories. The core category acts as the central issue around which all other categories can be integrated (Bryman, opcit:392). The categories are further refined in light of their relationship to the core category.

An outline, or skeleton, conceptual framework has been developed from the analysis of data relating to the second and third subject areas in the interview guide: householder response and levels of motivation; and methods of implementation. Conclusions will provide the structure for analysis and critical discussion of literature in chapter 5 which will inform the design of the data collection instrument for phase 2 of the empirical research.

4.2.4 Potential impact of personal biases and assumptions

The introduction to this thesis explained that a self-reflective approach would be taken to the research so as to recognise the potential impact of the author's values on the

subsequent findings and their interpretation. While this has been tackled in a broad sense, it is necessary to reflect on the potential impact that values might have in each phase of the research.

Like the providers themselves, the researcher is in a position of duality, having both an expert perspective¹ and being a homeowner. While experiencing the everyday factors that can conflict with making energy efficient home-improvements, the expert perspective can cause the researcher to feel guilty for not taking more positive action. This state has perhaps caused the researcher, in effect, to be biased in favour of the 'everyday householder' and could in turn have affected the interpretation of the data and thus the themes that have emerged as significant. With a belief in the value of lay knowledge (see 1.1), it is perhaps also unsurprising that the author has arrived at the conclusion that a householder-centred approach should be taken in developing domestic energy efficiency programmes.

In summary, the researcher feels that though she has a dual perspective on the research question, there is greater bias toward the perspective of the 'everyday householder' than that of the 'expert'. This perspective has influenced the critical framework for the interpretation of the provider accounts which in most cases appear to be more greatly influenced by the expert view². It is important that this bias is made explicit, as the interpretation and results are a function of this critical framework and should be read in this light.

4.3 Results: programme implementation and householder response

4.3.1 Introduction

The results of this case study represent provider perceptions of energy efficiency programmes for owner-occupiers³ in England. Each of the posed interview questions reflects the researcher's underlying interest in how homeowners can be engaged in energy efficient home improvement. However, the researcher has focused on trying to

¹ if not, at this point, having an expert knowledge of the field, she does take the expert view that energy efficiency is fundamentally a positive thing

² perhaps a function of the work environment and being accustomed to the organisation's official perspective on 'the problem'

³ The NEA data relates to public as well as private sector, however, there is no indication that the advice approach differs according to the public/private status. This data is, therefore, assumed to relate to owner-occupiers for purposes of analysis.

reveal meaning from the perspective of the providers. Hence there is some discussion of the inference of specific words and phrases used by the interviewees as well as the reporting of more clear-cut facts and experience. Each sub-section of this results section chapter focuses on one of the emergent categories, each of which represents a group of concepts raised by the providers.⁴

4.3.2 Getting the message across

Following open and axial coding of the interview transcripts, a core category emerged around which the researcher felt that all of the other categories could be integrated: **'getting the message across'**. This core category represents the central issue that will determine what Strauss and Corbin (opcit.) call 'the storyline' that will frame the following account of the interviews. Figure 4-1 is a visual representation of the way in which the themes have been integrated. The diagram is offered at this stage only as a reference for the reader, to clarify the understanding of the following account and will be further explained at 4.4.

⁴ The quotations extracted for this chapter are word-for-word transcriptions from tapes, except that redundant er's, repetitions and false starts have been removed. The abbreviated name of an organisation is shown after each quote to indicate the quote's source (see appendix A, table 13-1 for translation). Interviewer questions and statements are given in bold to distinguish them from interviewee responses. (see appendix A for full interview guides)

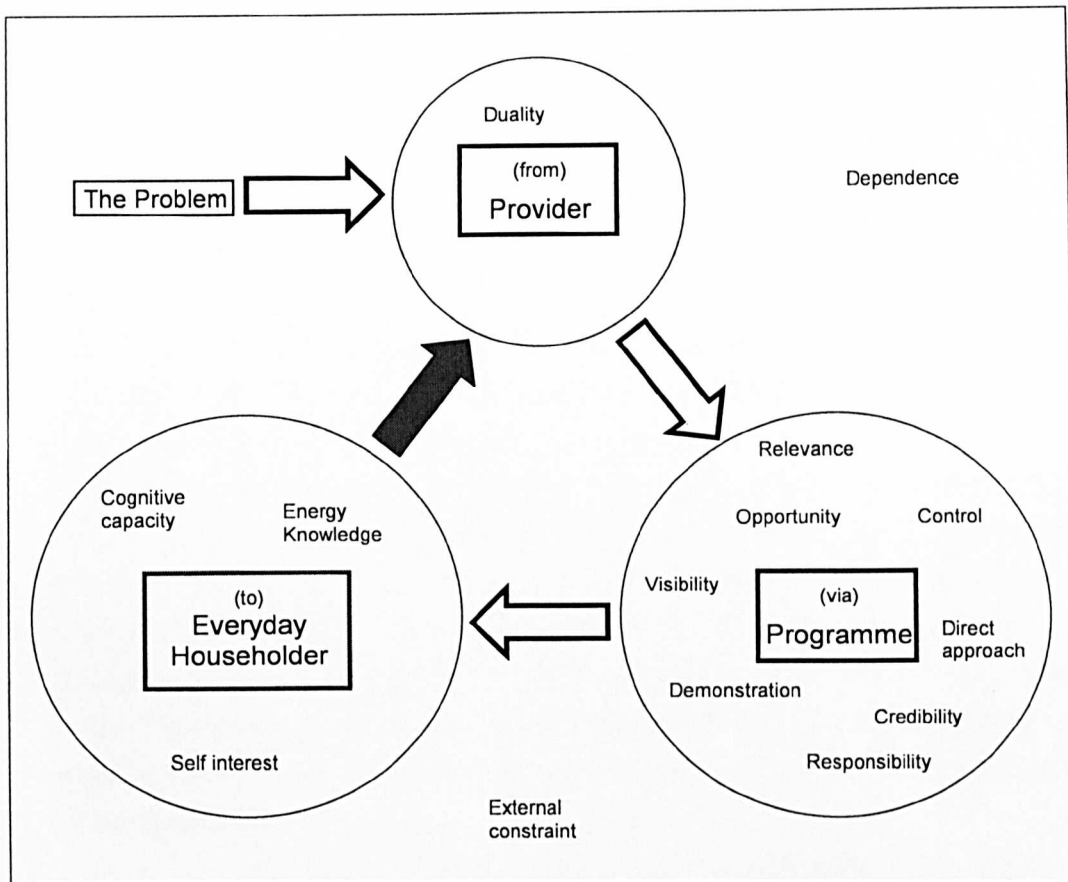


Figure 4-1: A representation of the outline conceptual framework: 'Getting the message across'

The label used to represent the core category emerged initially as an 'in vivo' concept:

'...it's getting the message across that if they use the heating system in the right way they will be much warmer and they will in be a much better position to save money.' (EAC)

Another participant uses variations on this phrase, for example:

'...you need to get across to them the message that they are entitled to this and that if they are sitting in cold homes they don't need to be.' (SP)

The idea of getting the message across is reflected in other related concepts, each of which revolves around communication, e.g.: selling (an idea), persuading, instilling,

explaining and showing. Each of the concepts within this category infers something more than mere delivery of information; they infer that as a result of the information a change occurs in the receiver. In the context of this research, the change is intended to result in an increased likelihood that the householder will engage in energy efficient home improvement.

Key to understanding the core category is an understanding of the relative positions of the householder and the provider. It is always the provider who aims to get the message across to the householder via a programme (see figure 4-1). Everything that the providers do with the aim of motivating householders to act is with reference to their own conceptualisation of the householder and their own conceptualisation of 'the problem' that they aim to solve through the householder action. The significance of the providers' conceptualisations of the householder lies in the fact that the success of the programmes depends on the householders' compliance: householders cannot be forced to act on advice or take-up incentives, hence, their perspective must be considered. Three initial themes, therefore, emerge in relation to 'getting the message across': 'dependence,' 'the problem' and 'householder identity'. These themes are explored further below along with other key themes which will arise during the course of the discussion.

4.3.3 Dependence

Currently no legislation exists to require owner-occupiers to take action to improve the energy efficiency of their homes. Providers are therefore dependent on these householders for success, since they themselves are rarely able to take direct action. Instead they are limited to 'persuading' and 'encouraging' by offering advice and providing incentives for action. This dependence is also reflected in the word 'try,' which is commonly used by providers in relation to their activity:

'We try to get there in as many ways as we can.' (NEA)

'I think because what we are trying to do is get people to act, just telling them what they can do isn't really enough.' (EST)

Providers cannot guarantee the outcome of their efforts. Ultimately they can only 'try' to do things since the delivery of the energy programmes is not the aim itself; it is the results that determine the level of success. There is a sense of frustration among the

providers due to their dependence on the householders. Some appear to see their position as ultimately helpless despite all their efforts:

'But at the end of the day, all you can do is persuade somebody to do it, either by pointing out to them that this is what the Government wants, or that this is best for their grandchildren, but at the end of the day you can't do anything about it.' (GT)

The latter quote highlights two factors that might potentially motivate householders to act: 'pointing out to them that this is what the Government wants, or that this is best for their grandchildren...' These examples can be seen to represent two alternative perspectives on 'the problem'⁵; the first being the government perspective and the second being the householder perspective. In the first instance the householder is effectively being asked to tackle the problem as conceived by the Government; in the second instance, the householder is being asked to tackle the problem as they themselves might conceive it. While there is scope for difference in each party's conceptualisation, surely there remains potential difficulty in conceiving a message that will elicit a positive householder response? On this basis, it is important to examine 'the problem' on which the provider constructs the message.

4.3.4 The problem or the opportunity

'The problem' essentially refers to that which ultimately drives domestic energy efficiency programmes. As explained, programme providers are confined to 'trying' to work through owner-occupiers. Though these parties must work together for programmes to be effective, it is important to note that each party's perspective on the 'the problem' is likely to differ as a function of the professional and lay roles of the provider and householder respectively. It is suggested that this condition of conflict lies at the heart of the difficulty in engaging owner-occupiers in energy efficient home improvement. For example, most of the providers interviewed are driven either by a need to reduce emissions of CO₂ for reasons of climate change or by a need to alleviate fuel poverty. In the former case, however, there is a clear sense that householders are rarely motivated to act for the same end:

'...my view is that consumers are unlikely to be motivated at the current time by carbon savings. It's a very noble thing, but most people if they came across a ton

⁵ i.e. the problem that will be solved by increasing domestic energy efficiency

of carbon dioxide, they wouldn't know that they'd bumped into it. What's more likely to motivate is either comfort or reduced running costs.' (DETR 3)

'They [the local authority] can also look at things globally ...and they can prove that that will reduce CO₂ emissions ... But you can't say that to a private householder, because they are not really into it. So it does boil down to some sort of incentive, whether it's a cash saving over the years, or whether you can give them something... ' (GT)

The providers think that householders are driven primarily by the promise of personal benefits rather than the thought of saving the environment for the 'greater good'. On this basis, 'the problem' is translated into an opportunity to be viewed from the householder perspective, e.g. reduced fuel bills or increased comfort. The message that most providers are trying to get across is, therefore, currently conceived on the basis of their own perspective of what householders conceive as an 'opportunity'. There is some disagreement in the data over the issue of saving money, with some providers having found that this is not necessarily highly motivating. This issue appears to be linked to income level, although no reliable pattern emerges in the data with one person concluding that middle to upper income households are more likely be motivated by money-saving and another inferring the opposite:

'People with money will often be more conscious about saving money than the people who don't, because people who don't haven't got that choice. They've really got to live from day to day.' (SP)

'The amounts of money that you can save people are so small compared to their [household] expenditure, that that's not a sufficient motivator...' (EAC)

Another provider supports the notion that income level determines whether or not you can make the energy efficiency 'choice'. He goes further, linking notions of standard of living, self-protection and education with the idea of a person's 'culture':

'People who have a decent standard of living, I think they protect themselves better. They've got the means and they're educated to saving things as well, it's part of their culture, whereas a lot of people they just haven't got the means - they're thinking about food on the table.' (SCC 1)

The provider appears to see culture as a product of education and, in turn, of income. Among those with a 'decent standard of living' he seems to say that there is an inherent culture of self-protection and of saving things- traits which might be lacking in those who have a lower standard of living. While it is easy to see the link between energy efficiency and 'saving things', the link between energy efficiency and 'self-protection' becomes tenuous in the context of middle to upper income households. If self-protection is about ensuring warmth, the most accessible route to self-protection for middle to upper income households is surely to increase the use of heating, rather than to install insulation, hence increasing rather than reducing energy consumption. However, this insight perhaps suggests that there might be potential to tap into and work with the traits of a person's culture in order to increase motivation.

While the environmental problem and need to reduce CO₂ emissions drives many of the programmes represented, this area is not seen as something that can drive householders in the way that it drives the programmes themselves. However, it is seen as something sometimes 'worth mentioning' (EAC) and is an area perhaps gaining in motivational potential:

"When we first launched the programme, people said "even if you show us that it is green we will not be interested." So now that they have opened up, what they are saying is, "well money doesn't motivate me necessarily, but environment might do." (EST)

A number of providers suggest combining the environmental problem and the personal gains in the message:

'...if you can get the message across about CO₂ emissions and global warming, that it doesn't mean doing without, but spending money more wisely and saving money as a result, I think that's probably the way that you would try and market it.' (EAC)

Despite attempts to construct 'the message' from the householder perspective, this message clearly suffers from low motivational power on occasion. Perhaps this is because the householder does not, in fact, see 'the opportunity' on which the message is founded? First, convincing someone that they can save money by reducing fuel bills

relies largely on a perception that bills are currently high. If people do not feel that their bills are unduly high, then they are unlikely to think that it is worth trying to reduce them. Unfortunately, the billing system in the UK does not encourage homeowners to link their lifestyle to their bills:

'One of the biggest things we are trying to do is battle against the utilities in the way they have manipulated the market ... what comes through the door is a bill based on you paying x amount of money and you are either in credit or in debit basically. Sometimes somebody will be in credit by a lot, and they will look at that and they will get this feel-good factor straight away, that means that their next bill is going to be nothing you see, is their attitude...and they are able to look at that and say, well that's okay, I am efficient.' (LEAC)

Second, the message about saving energy presumably relies on a perception of energy inefficiency. But as the latter quote indicates, many homeowners in fact perceive themselves as efficient; hence there is no problem of inefficiency to be solved.

Third, the message about increasing comfort is founded on a perception of existing discomfort. While middle to upper income homeowners are able to afford to keep their heating on and increase the temperature in their homes, they will be comfortable (despite poorly insulated homes). Lower income homeowners will not necessarily be able to maintain comfort, however, this is unlikely to motivate anything other than installation of low- and no-cost measures, for obvious reasons. Clearly, in terms of the 'environmental problem', low-income households do not offer the greatest 'potential' in any case, since they use relatively little energy in the first place.

Finally, where the message focuses on the environment, the opportunity presented relates to reducing global warming and the destruction of environment for future generations. As explained, this issue appears to be attracting increasing interest among householders and gaining motivational weight, but it is not yet a prime mover. The complex nature of the environmental problem is perhaps one reason why people do not 'see' it:

'...the environment is very hard to explain, you can't explain it in a 30 second advert, whereas you can through PR. You can do features on it, you can really

talk about climate change issues and explain to people what it means. It won't mean that there will be wine growing and all this kind of thing...' (EST)

The success of the message here relies on an explanation of the problem of global warming and, critically, it requires an explanation of how domestic energy efficiency can help to reduce the problem. The first task will prove difficult while myths exist; the second is made difficult due to the relatively intangible nature of the problem, which, unlike discomfort and high fuel bills, apparently has no direct affect on the householder's everyday life. If householders do see the problem, they are, therefore, unlikely to see it as one which offers an opportunity for individual response. The task of the message is therefore to both dispel myths and also to *re-educate*.

Those programmes that focus on low-income households might see environmental opportunities as an additional benefit, but they are driven primarily by concerns such as the eradication of fuel poverty and enabling vulnerable people to remain in a healthy and secure state in their own homes. Providers again tend to translate the problem into an opportunity to be viewed from the householder perspective. However, here, the problem and the opportunity appear to be more likely to coincide. For example, fuel poverty, whether seen as a problem to solve or an opportunity for personal gain is one which relates to affordable warmth. The aims of the provider and the householder are hence the same.

It is suggested that health and well-being-driven programmes are more likely to result in messages that coincide with the householder's perspective and everyday experience than those driven by climate change. Where the message and householder perspective coincide it appears that the message is more likely to get across.

4.3.5 Responsibility

Responsibility emerges as another major theme in relation to getting the message across. Some providers see their task as one of getting the householders to take responsibility for their own actions:

'What the research showed was that if we made it personal to them and kind of ridicule them a little bit... Say, you know you're wasting energy, it's not just your child. Take responsibility for it.' (EST)

The emphasis here is on getting people to recognise their *individual* responsibility. Linked to this idea is a sense of duty or obligation that comes across when providers speak of what the householders 'ought' to be doing and what they 'should' do. But the providers do not think that householders necessarily take the same view:

'What we realised was that the prevailing culture was, give me a grant. I'm saying to these people, just driven up in their BMW's, "why should the State give a grant for something that has a three year payback?" "If the Government wants us to reduce energy it should give us a grant." I thought, gimme-a-grant culture.'

(NSEA)

The 'gimme-a-grant' culture is a reflection of the view that saving energy is something that the Government wants us to do: it should therefore be the Government's responsibility. The environmental problem is therefore conceived as belonging to the Government rather than to a nation of individuals. Perhaps then, identifying environmental issues and energy efficiency with the Government should be avoided, since this could ultimately act as a barrier to possible action? Some providers take the opposite view, feeling that government backing can improve the success of programmes, as this provider explains when talking about a previous insulation grant programme:

'...it was a signal to ordinary people that that activity is worth doing because the Government has supported it. If it [the message] came from a government department rather than the EST which people might not know is funded by the Government, it would have a lot more weight...' (EAC)

The relationship between the Government and the energy efficiency organisations is potentially a difficult one, especially in the case of the EST:

'It's quite a difficult relationship I think, because on the one hand, they [EST] are a private company but on the other hand this is public money, and I think it is difficult for them, you are almost extra constricted because you have to be answerable to tax payers.' (DETR 1)

Where some might feel that they need government backing to gain 'weight' and credibility, others need to break free of the public sector in order to be eligible to seek

private funding. The experience above suggests that where organisations do have government backing they are in danger of being seen as messengers for the Government and hence running into the potential problem of the environment as 'the Government's problem'. The advantage of retaining independence in the eyes of householders is perhaps that the organisation can instead be seen as being there to 'help' or provide a 'service', rather than to take full responsibility. This is the view that providers themselves take and the view they would prefer householders to assume.

Providers tend to talk of either helping or providing a service, rarely using both terms. The word 'helping' tends to be associated with those organisations whose activity focuses on 'vulnerable' households, whereas middle to upper income households are primarily provided with 'a service'. While being closely related, the two terms have different properties and characteristics. One scheme, in 'helping' vulnerable householders, offered a grant for energy efficiency work, but left the cost of associated redecoration to the householder. In taking responsibility for the 'serious' energy efficiency measures, but leaving the 'non-serious' decorating to the householder, it is inferred that the authority feels it was doing the householders a favour and hence shouldn't have to pay for the decorating. The fundamental reason for the different attitudes, it is suggested, is money; where people are helped they tend to be directed to and offered financial help to improve energy efficiency, whereas those who are provided with a service are more likely to be expected to spend their own money on measures. The latter group are clearly in the better position to expect good service. In particular, each term seems to demand a different response in the householder; the former perhaps inferring that the householder ought to be grateful, the latter inferring that the householder has a right to expect high standards.

4.3.6 Control

The notion of control is associated with the concepts of helping and providing a service. Where people are 'helped' it seems that some providers take control on the basis that they are 'the expert' and hold the knowledge necessary to make the 'right' decision. It is inferred that power essentially resides, or ought to reside, with knowledge. Some providers appear to acknowledge only 'expert' knowledge - i.e. that relating to the technical side of domestic energy efficiency:

'Because we deal with it day in day out we should be telling them and informing them because we've got the best knowledge, I think. And it stops any time wasting etc.' (SCC 1)

'I made it quite plain that I was in charge and I decided. I wasn't having any messing about.' (SCC 1)

There is a sense that expert knowledge needs to overwhelm the desires and aspirations of the householders. 'What people want' is a concept that one provider specifically sees as conflicting with the 'best' solution to the problem. 'What people want' therefore becomes a barrier to alleviating climate change and health and well-being problems; i.e. a barrier to what the provider believes is best for the planet and the householder.

Other providers acknowledge the value of the more holistic knowledge held by each individual about their life. This is reflected in the practice of giving householders the space to control their own decision-making process:

'Once they've discussed the work with someone they feel comfortable about it and they can actually make decisions. Because it's their house.' (SP)

Some more senior clients appear to dislike the idea of being given a grant, seeing this as charity. However, if they can make a financial contribution to the work, then a sense of control is re-established, enabling them to proceed with necessary work:

'They were happy because they were contributing and then it's not seen as charity you see. Even if [they can only contribute] a relatively small amount, they then sort of take control.' (SP)

One provider clearly recognises how important is a sense of control to the householder when he talks of passing on 'conceptual ownership' of a project to local people. Finally, one organisation acknowledges the importance of householder knowledge by designing its energy advice training programme on the basis of householder enquiries:

'It's initially come from research, from the type of enquires that you get from speaking to housing officers and the fuel utilities, from what they are telling us the

people in their homes are asking. So you know where the problems are and that's where these key issues come from.' (NEA)

The notion of 'people in their homes' is clearly important to this particular person, and one which is repeatedly used. The phrase reflects an awareness of the individuality of each household's experience and associated needs. The delivery of specific, tailored advice through home visits is promoted by this organisation: could this be a result of the organisation's conceptualisation of the householder? An examination of the language used by providers to refer to householders could prove fruitful in establishing the perceived householder identity on which the message is founded.

4.3.7 Householder identity

Many providers, when talking about householders, use blanket terms. Concepts such as Customer, Consumer, Homeowner, Market(s), Audience and Client, all deny the householders their individuality, citing them as a mass. Such concepts infer that householder characteristics and needs are defined by the group identity. For some providers the use of these terms is perhaps simply for convenience and it is clear that they do also recognise individuality. Individuals, Individual households, People in their homes, Real people: each of these terms infers recognition that in order to achieve success in getting the message across, the needs of individuals must be considered. In particular, 'People in their homes', cited above, seems to create a new entity, integrating the home with the user, inferring that there is a need not just to consider the needs of the individual, but also to relate them to their individual contexts.

The providers also talk of many different factors and properties relating to householder identity. For example, there is mention of the householders' worries, concerns and fears; their awareness, receptiveness, interest and recognition; their desires and aspirations; education, cleverness and knowledge; their upbringing and what they are accustomed to; how they feel about themselves; pride; complacency; and many other factors besides. This array of factors represents the potentially complex nature of the householder identity in relation to energy efficiency. Since each of these traits or householder qualities can potentially affect the householder's ability to hear and respond to the message, an understanding of these factors might inform the provider's approach to getting the message across. It is noticeable that some providers are, however, primarily concerned with understanding the individual dwelling rather than its individual occupants:

'What you need to do is very individual to a person's home.' (EST)

'... what we were trying to do was make the best package possible for that property. It can include everything. It could be, cavity wall...etc. it could be all of them. But I just tried to do a complete package of everything in that particular house...' (SCC 1)

This perspective does not appear to include the individual occupants in the energy efficiency equation. The prescribed solution is determined entirely by the characteristics of the home. It is noticeable that the two organisations which focus on 'helping' people, talk more about the needs of individuals than the factors which might contribute to an optimal energy solution:

'So then as an organisation we then started focusing on the individual. The first thing we try and do is maximise their income...Often the client isn't articulate enough and doesn't understand enough and still see it as charity. So we visit everybody in their home... and then we can advise them.' (SP)

The exception is the provider who talks of helping vulnerable people with the aim of getting people 'out' of fuel poverty. The solutions he prescribes appear to be based solely on technical information about the home and hence he feels that homeowners do not know what is best for them. His own use of the word help is in the context of financial help:

'...a lot of people they just haven't got the means - they're thinking about food on the table. I suppose education would help but I don't think it's the B all and end all. You've got to help people. And I think there's worse things that the Government could put their money into, I think. Simple as that.' (SCC 1)

The reference to 'vulnerable' people by the above provider is one example of a householder sub-group. These groups can be seen to lie somewhere between the two ends of a notional individuality scale. The providers define these groups by many factors: income level and ability to afford, age and associated lifestyle, household type (eg single parent, families with young children), culture, ability, level of education and level of deprivation. The providers tend to imbue the members of these sub-groups with

certain characteristics relating to home energy efficiency. To take a straightforward example, low-income households tend to favour low- and no-cost energy efficiency measures. Also, older householders tend to be more likely to be driven by the idea of not wasting things – a factor which is attributed to having experienced the ‘wartime spirit’.

Another householder classification system arises from observing the householders’ approaches to seeking energy efficiency measures. Five types of customer are cited: passing trade, the pound in the pocket brigade, the reactive customer, the proactive customer and the revisiter. By knowing which type of customer group the householder falls into the provider could in theory tailor the advice approach for increased effectiveness.

4.3.8 The Everyday Householder

Whatever the degree of individuality the provider affords the householders, one particular theme appears to hold overriding significance:

‘...it’s that the normal householder doesn’t give enough thought to the subject [of energy efficiency and the environment].’ (GT)

The notion of the ‘normal householder’ is indicated in other similar phrases such as ‘the ordinary person on the street’ and ‘the man on the street’. This theme infers that the providers are very aware of the difference in perspective between themselves, the experts, and most householders. On reflection it was felt that the in vivo term ‘the normal householder’ might infer ‘normalcy’, i.e. a tendency to a standard, when read out of context. Therefore, the term adopted to represent this theme is instead ‘the everyday⁶ householder’. This difference between the expert and the everyday householder essentially lies in their knowledge of and level of interest in energy efficiency:

‘...it’s very esoteric, the sort of thing that you and I write books about and is not of interest to the man on the street.’ (GT)

⁶ ‘Everyday’ is used in the Le Febvrian sense, summarised by Wigglesworth and Till as ‘the residue that is left over when all the specialised activities have been removed’ (Wigglesworth and Till, 1998:7)

This is where the real challenge lies: providers do not simply have to get the message across, but they have to get the message across to the everyday householder. For some, the idea of dealing with the everyday householder has implications for what one should expect to achieve:

'It's not reasonable to expect people to do that. All I'm interested in is getting people up to that reasonable level.' (GT)

It is as though the householders' 'everyday' status demands that expectations remain reasonable and do not ask too much. Similarly, future initiatives need to be 'realistic':

'There should be 2 SAPs set; a SAP for cavity-filled houses and a SAP for non cavity-filled houses [solid wall]. I would go a bit further, but we've got to be realistic.' (NSEA)

Some providers seem to feel that it is unrealistic to expect anything from the 'everyday householder': getting householders to change is described as a 'pain in the neck'. The most realistic approach, therefore, is to by-pass the householder altogether, choosing solutions that avoid the inefficient approach. One provider chose renewable energy as the means to achieve his targets, seeing this as the only way to guarantee results for his efforts:

'...if I'm going to spend time on something, what effort do I put in, what CO₂ do I get back? It's more complicated than that. But I could see us putting a huge amount of effort in for private householders to do bugger all. But I could see putting effort in and getting a 7 megawatt [renewable energy] power plant with CO₂ savings.' (NSEA)

This concept begs the questions as to whether or not the reasonable and the realistic should determine the framework for the design of domestic energy efficiency programmes. Are the current programmes reasonable and realistic enough? Or is there even a danger that they could be too 'reasonable', deferring to the uninterested 'everyday householder' and thus falling short of the mark?

4.3.9 Duality

While the providers speak as if they have a different perspective on and conceptualisation of 'the problem' there are signs that this perspective is essentially a product of their professional role. The providers are all experts in this context and this perhaps distorts their view:

'It is always difficult to give a view of what the general public think because working here you are overly aware of everything anyway, so you are a bit more green than everyday.' (DETR 1)

But providers are also householders and, in many cases, homeowners. This affords them with a dual perspective which most permit to surface at some point in their interview:

'...you'd do it yourself wouldn't you? If you were given a list like that you'd pick out the most expensive items and sometimes that isn't the best way of saving energy...' (SCC 1)

'I'm one of them in a way, probably more from a point of apathy and, just thinking about my own house, it's awful, it's do as I do, not as I say...It's so much easier to stay as you are.' (SCC 2)

'The problem that we have, that you can recognise on a personal level, is anything that requires having builders and people coming into your home is not always overly popular.' (DETR 1)

These passages show the providers' capacity for empathy with homeowners. While they regularly show signs of frustration with the challenge posed by the 'everyday householder' they are able to understand exactly why the task they face is so difficult since at times they too slip into the role of the 'everyday householder'. Since providers are dependent on householder compliance, it is essential that expert 'solutions' are compatible with the householder perspective. The dual perspective clearly offers opportunities to inform programme design, however, it is not clear that this step is being taken, despite insights such as this:

'I don't like buying things over the phone - I like to do things myself and decide myself if I'm going to make changes and I think that is critical...'(SCC 2)

Ironically this comment comes from the same organisation that prefers to make it plain that it is 'in charge'. The notions of 'informing' and 'telling' people do not speak of giving householders decision-making control. These terms allow no space for dialogue suggesting that the provider's role is simply to deliver the message. Even the notion of 'getting the message across' infers that the message is correct and hence, the message would be effective if only the householders would listen. If the message is not getting across then one might take one of two views as to why: either the message is indeed correct but the householders' perspectives do not allow them to hear (i.e. it is the householders' fault), or the providers' expert perspective has not allowed them to construct an intelligible message (i.e. it is the provider's fault). Both views suggest that failure might have been avoided had the providers drawn on their dual perspective.

While the provider believes the message to be correct, the means to comprehension would appear to lie in changing the householder perspective i.e. enabling the householders to speak the expert's language. This is perhaps the reasoning for those campaigns, such as that run by the Energy Saving Trust, which aim to change attitudes to energy efficiency. This approach would allow the message to remain the same, and the householder to eventually see things from the same perspective as the provider, hence resulting in comprehension of the message.

Interviewees from the Energy Saving Trust talk of the idea of trying 'to make energy efficiency mainstream' and 'mak[ing] people accept it as being everyday'. This they aim to achieve through the promotion of an energy efficiency brand through advertising and PR via 'the everyday routes' such as television. The interviewees recognise that the attitude shift they are working towards will take a long time to achieve, drawing parallels between this and the Drink Drive campaign, which apparently took 20 years to succeed.

The alternative way the expert might try to get the message across would be to construct a message that is understandable from the *current* householder perspective i.e. using the householder's language. This idea is allured to by some of the providers:

'Somebody said to me, the advice has got to be personal to them, and I suppose...giving out a low energy light-bulb which we used to do...it allows us to talk about insulation and conservation, but it also allows us to talk about better lighting on the stairs, because it allows you to leave the light on and reduces the risk of falling. Because that then registers with them. But if I say this is going to save you so much a month, they just shrug their shoulders...it won't register.'
(SP)

Whether trying to change or to work with current attitudes, one might expect that an understanding of householders would render the approach more effective. This understanding demands that the provider draws on the dual perspective, to recognise the key traits and qualities which might affect the householder response. In the latter quote, the message has been constructed with reference to the low level of interest of the 'everyday householder' in energy efficiency. Rather than focusing on saving money and the environment, the provider recognises and makes links to those issues perceived as relevant by the householder. This relevance permits the message to be heard and understood.

4.3.10 Relevance

'Relevance' emerges as a key theme, its importance being indicated by a number of other related phrases. The providers talk of the householder's ability to 'connect with' and 'associate with' campaigns; they talk of the information that is 'relevant' to the householders, advice that is appropriate and features that are 'of benefit' and 'attractive'. In the previous quote it is the 'personal' message which 'registers with' the householders. It is the relevance of the message which enables the message to 'get across'.

Closely related to the idea of relevance is the notion of what is 'foremost in their minds':

'You'd probably find single parents are more alert to the problems because they have the responsibility of the children, so they are more likely to come to you than maybe a pensioner would be because they have the needs of the children foremost in their minds.' (NEA)

This quote suggests that whatever is foremost in the minds of householders has the potential to influence their response to energy advice. There is also a suggestion that

sub-groups of householders might share key items that are 'foremost in the mind' due to the shared characteristics of their situation. This idea is supported by an earlier reference to low income households 'thinking about food on the table', which is seen as a barrier to thinking about energy efficiency. Should providers, therefore, be aiming to influence what is 'foremost in their minds' or should they instead accept these issues as they currently exist and try to work with them to their advantage? The EST appears to aim for the former:

'They are still saying, it's still not an issue for me and there is still a hell of a lot of work to be done, but it's beginning to get into people's minds.' (EST)

One provider conceptualises energy efficiency measures themselves as 'a consideration'. This word acknowledges the process that the householder must go through before making a decision as to whether or not to pursue the measure. It infers a thought process involving the weighing-up of the event's pros and cons in relation to its context. The householder's own perspective on the pros and cons will clearly inform the final decision and perhaps it is those issues that are foremost in the mind that will have greatest influence on this consideration:

'...once it's about £15 or over it becomes painful and it's more of a large investment type consideration.' (EST)

The provider here infers that there are different types of consideration, each one being defined by the size of the investment that is demanded. Perhaps then the factors that the householder brings into the consideration are determined by the cost bracket that the energy efficiency measure falls into, as well as those issues foremost in the mind?

Another interesting, if infrequently arising, theme that could perhaps shed light on the householder's thought process is the notion of 'a good idea'. This theme, also indicated in the concepts 'it makes sense' and 'sensible' apparently appeals to householders:

'People did it themselves; they did it by and large because it was a good idea.'(EAC)

'We do a lot of work with utilities because as far as consumers are concerned it's where they get their energy from so it makes sense to go back to them for advice.' (EST)

Perhaps above all, the notion of a good idea holds the key to gaining householder interest and motivating action? The defining characteristics of a good idea appear to include a perception of relevance. The idea (or message) needs to make sense in relation to the individual's circumstances. Here the provider refers to his elderly clients:

'...what they spend their money on has to be sensible to them and not somebody 15, 20 years in the future, because they're not going to be here...' (SP)

Persuading people that something is a good idea is part of the challenge for providers. Integrating this idea within this category, one might come to the conclusion that providers stand the best chance of getting the message across where the good idea is both relevant and coincides with those issues that are already foremost in the minds of householders.

4.3.11 Visibility

One provider's insight reveals yet another aspect of the householder's thought process when considering energy efficiency measures: the idea of investing in 'experience':

'...if you find the money to give them a roof, they'll find the money for the heating, because that's something they'll experience.' (SP)

As he continues, the provider reveals that people perceive their experience to be determined largely by what they can actually see:

'You get them to spend money on the roof, they don't even see it... All they'll see is that there's no more water coming in and if the water wasn't that bad, they'll have spent a lot of money on a new roof and they don't know. If they put central heating in they do...' (SP)

Householders clearly like to feel that their investment has been 'worth it'. The most obvious way to feel assured in this respect is to have something to show for it: this idea relies on actually being able to see the improvement. This suggests potential difficulties

with trying to persuade people to invest in 'invisible' energy efficiency measures such as cavity wall insulation, whose benefits are also invisible.

Perhaps the answer lies in making links between the measure and those things that are more visible. The example of the 'light bulb on the stairs' cited above (section 4.3.9) reveals the potential to connect energy efficiency to those issues that are foremost in the mind and thus more 'visible'. Could the idea of energy efficiency as an 'add-on' to foremost issues offer a route to visibility and hence to motivating action? The notion of energy efficiency as a linking 'add-on' issue is one which recurs in the interview transcripts.

It is apparently the 'all-encompassing' nature of energy efficiency that renders it able to link to so many other areas. According to one DETR policy advisor, 'The whole idea with energy efficiency is to link with what other areas are doing' (DETR 1). Non-government organisations have taken a similar view, reflected in some of their initiatives:

'We have an education officer here on the training section and we try to build domestic energy efficiency into the national curriculum, not as a stand-alone subject, but it can be brought in through other schemes.' (NEA)

While the benefits of 'adding-on' and integration are apparent, others have highlighted the strength of the 'stand-alone' position. The Energy and Environmental Audit Committee (EEAC) recommended that an energy efficiency agency be established, but this idea was dismissed:

'...it links in with so many other things; it's impossible to draw a boundary around it.' (DETR 1)

But perhaps the EEAC recommendations point to a potential weakness in the 'all-encompassing' nature of energy efficiency: perhaps treating energy efficiency as an add-on issue dilutes its identity, thus reducing its visibility. There appear to be arguments both for integration and for distinction, neither providing the obviously superior route.

4.3.12 Demonstration

It is possible that the desire to experience a measure visually might be satisfied by a 'dummy' visual, which instead provides the necessary assurance. Providers frequently speak of 'showing' householders what they can save, or what they can do. This can be achieved by a number of means:

'...[It's good] to actually show them what can be done. We do actually have in the shop a lot of interactive displays where you can actually demonstrate - the meters are there and you can see the difference. If people can actually have the concrete action in front of them and see it really works.' (LEAC)

'What we're trying to do there is to actually show people through a self-survey of their own house...' (LEAC)

The householder is ultimately looking for proof, or a demonstration that their investment will be worth it and for some this can be provided by an authoritative piece of paper:

'So if you can say to people that you can make a saving and we can prove it by doing an NHER survey and printing it out for them on paper, what the effects are likely to be in terms of cost and CO₂ emissions and those things, they take notice of it... You might say it's an incentive, like giving away a light-bulb, giving a piece of paper that they are prepared to accept proof that they will save £50 a year.'
(GT)

The potential barrier presented by a lack of proof persists on another level, as revealed by one provider's insight:

'There are the two areas: the fuel poor who can't afford it and then the likes of me... The pain of it isn't being felt by the people who can afford it and I think somehow we've got to do that...' (SCC 2)

Here it is being suggested that if middle to upper income households could 'feel the pain' then they would be motivated to react. The proof potentially lies in directly experiencing the effects of inaction. How one might get householders to feel the pain is a tricky and potentially controversial area. One approach might be to introduce domestic carbon taxing, however, this is unlikely to be considered politically viable.

What is clear is that while the effects of inefficiency are intangible in day-to-day life, the chance of a positive householder reaction to ameliorate 'the problem', as conceived by the providers, is diminished.

4.3.13 Credibility

The providers describe energy efficiency programmes in terms of numerous properties and characteristics, e.g.: flexibility, scale and proactivity; enthusiasm (of individuals) and sensitivity of the workforce. It is not difficult to see how these kinds of properties might potentially affect the householder response to programmes.

One recurring property that appears to have an important impact on getting the message across is 'credibility'. The theme links back to the idea of householders seeking proof that their investments will be worth it: the proof will only be trusted if the source is credible. Where commerciality comes into the equation, credibility is called into question. Organisations that are perceived to be independent, such as local councils, tend to lend credibility to schemes, however, even council-backing can sometimes have an undesirable effect if the reputation is not sound. The credibility of the message itself not only depends on the credibility of the source, but also on consistency. The providers cite the problem of 'mixed messages' which apparently confuse householders:

'...if you're trying to sell that message, it's cool to be energy efficient, to have running along side it, do your bit by turning your thermostat down, sitting in the dark and freezing, then it's not sensible at all, because people get mixed messages which are very confusing.'(EAC)

Also potentially problematic is the practice of giving generic advice in the form of estimated savings and payback times for energy efficiency measures based on the so-called 'average' home. This can prove misleading for those householders who base their decisions on such figures. Following a misleading experience, it could prove difficult to regain the trust of a householder who might question the credibility of all energy efficiency advice from there on.

The confusing messages concept is indicated by other providers who talk of there being too many schemes available, too much use of inaccessible technical language and also a lack of visible activity by Local Authorities and the Government. Where

Local Authorities have been active in improving the energy efficiency of their own housing stock, providers have noted an increased receptiveness to energy efficiency by private sector householders. Some believe that the Government should take note of this experience and set their own good example by demonstrating their commitment to energy efficiency:

'There is a limit to what I am going to do if the Government hasn't done it's bit...and in my opinion the Government still has not done its bit.' (NSEA)

This suggests that while the Government is not seen to be actively committed to improving energy efficiency it is undermining the credibility of its own message: why should householders believe the message and act on it if the Government itself does not appear to believe in it?

4.3.14 A direct approach

When providers speak of what they try to do through their energy efficiency programmes they use many different terms and phrases. They speak of reaching the audience, directing people, educating, overcoming the problem, making it work, making it happen and many, many other aims and purposes. The variety in the terms used is a reflection of the array of factors which contribute to the process of getting the message across. Despite its apparent complexity, providers infer that the process can be simplified into a number of stages. Though never strictly defined, four different stages can be identified: awareness-raising and interest generation; provision of information about 'solutions'; provision of information about taking action; the action itself. But a problem seems to occur early in the process, between stages one and two:

'...some of them had a feeling that there was somebody out there that could provide them with more information, but they weren't terribly aware of exactly who and how. When you did show them the leaflets or talk about what we did they really liked the idea and felt that was exactly what they wanted, but it's a problem, you know, here's the water, here's the horse, how do you get the two together.'
(EST)

Perhaps having an isolated 'provision of information' stage represents an unnecessary diversion. This appears to be avoided where a 'direct' approach is taken:

'... the other tack of saying to people, here's a condensing boiler we can give you a plumber and you can get a grant, is so direct that they don't have sit there and show interest, wait for a pack to come through; send it back, get an advisory pack, they've lost interest by then. But because you've hit them, got their interest and you can fulfil it, then it generates action.' (EST)

By combining the necessary information with an accessible route to action, the momentum generated by initial interest carries the householder through to action. Similarly, it is suggested that 'ideally' installers would be advising, since householders aren't always sufficiently aware in the first place to seek further information. Installers could potentially raise awareness and offer information at a point where the route to action has already been embarked upon by the householder. One could see a parallel situation with DIY home improvement where the DIY store advisors (or even the products themselves) could instead raise awareness and offer information. This all-in-one type of solution potentially offers the 'no hassle' approach apparently favoured by most householders.

The notion of taking people through the stages in a process could perhaps prove to be a red herring if the timescale causes people to lose interest, as suggested above. The direct approach highlights the key roles played by accessibility and opportunity in motivating householders to act. Where some programmes rely on an attitude change to motivate action, it appears that others are placing an increasing emphasis on providing opportunity. However, providers do not appear to favour one route to the detriment of the other. In fact, there is consensus that in order to be as effective as possible programmes need to combine awareness raising and advisory activity with things like financial incentives and 'signposting'⁷.

4.3.15 External constraint

Finally, the providers clearly communicate their belief that they could do more if only they were not constrained by external factors. Most providers refer to financial constraints and believe that they could improve their success rate and raise targets if they only had bigger budgets. Some organisations feel constrained by their association with the Local Authority, since this prevents them from being eligible for some pots of

⁷ a term used where householders are referred to other organisations or individuals who can provide further help, often of a practical nature.

funding which might otherwise be available. Similarly, some organisations, particularly the Local Authorities, feel under-resourced in terms of staff.

On another level, trade and industry can potentially constrain providers, for example where an installer might contradict the advice of a provider due to his or her own lack of awareness and understanding of energy efficiency. It is also the case that some energy efficiency measures are difficult to source and have installed because the industry has not yet been convinced of the market for the products. On the other hand, once one company has recognised the market for a product, other companies tend to follow its example and the products can become more readily available and prices more competitive.

Providers therefore, construct their message within the constraints imposed by external factors and the outcome of the process is similarly constrained by factors beyond their control.

4.4 Discussion

4.4.1 Structural themes

Having identified the key themes, the chapter now turns to discussion of their significance and their inter-relationships. It is proposed that there are a number of structural themes, namely: the problem, householder identity, dependence and external constraint. An understanding of the relationship between these themes will permit interpretation of the significance of the remaining themes.

The domestic energy efficiency programme is driven by a particular problem which it aims ultimately to alleviate. The provider of the programme holds an expert view of this particular problem and of domestic energy efficiency, as a function of his or her professional position. The provider, therefore, either holds or has access to the energy efficiency expertise which would, in theory, permit the delivery of an optimal technical solution to the problem⁸. External factors, such as available funding and market constraints, provide the framework within which any solution can be implemented and potentially limit the solution to something less than optimal. In addition, the fact that the programmes being studied here focus on owner-occupiers limits the solution further.

⁸ i.e. one which achieves the maximum domestic energy efficiency for the particular dwelling in question, for a given budget.

This particular focus results in a condition of dependence i.e. the success of the programme is dependent on the householders themselves, since the implementation of a solution demands the compliance of the owner-occupier. Hence, while the expert view might yield an optimal solution in technical terms, this solution will not necessarily prove to be compatible with the householder. Getting the message across therefore relies on the construction of a message that is both compatible with the expert and the householder perspective. In this way the problem driving the programme can be solved through householder compliance.

In order to strive for householder compliance, the provider attempts to integrate the householder perspective with that of the expert. The provider achieves this by drawing on his or her own conceptualisation of the householder identity. This conceptualisation might in part be informed by the provider's own experience, since the provider is both an expert and (in most cases) also an owner-occupier. This duality has the potential to aid the provider's ability to see and understand the householder perspective. The discussion now turns to the remaining themes.

4.4.2 The Everyday Householder

It is proposed that the provider should focus on building an understanding of the 'everyday householder' perspective in order to construct a message that is both compatible with the expert view and also that of the everyday householder, within the given limits of the external constraints. The notion of the 'everyday householder' infers that the providers ought to have 'reasonable' and 'realistic' expectations and that the approaches they take through programmes are similarly 'reasonable' and 'realistic'. There is a need for more research into what constitutes the 'reasonable' and 'realistic' from the everyday householder's viewpoint. Many of the themes that have emerged from the data reflect those issues associated with the householder which will affect his or her response to the programme. These themes, in turn, suggest those issues which need to be addressed by the programmes in order to ensure a positive response. It is these themes that begin to define the limits of the 'reasonable' and 'realistic'.

As explained, the outline conceptual framework resulting from this analysis is intended to provide the structure for analysis and critical discussion of literature. The body of literature that might potentially be reviewed is extremely wide ranging due to the multi-disciplinary nature of the subject. Therefore, as part of the adopted iterative research process, and in order to make this review of literature more manageable, the author

has identified three key areas in the literature which she believes are reflected in the remaining themes. The terms for these areas have been borrowed from the literature and are as follows: self-interest; energy knowledge; cognitive capacity. These areas represent key traits of the everyday householder.

Self-interest, in this context, relates to the idea of taking care of one's self and maintaining one's ability to function effectively in a challenging world (after De Young 2000:515). Energy knowledge refers to the householder's conceptualisation of energy consumption and conservation (after Shove 1997:2). It is based on the notion that what counts as energy is determined by how it is known and experienced, hence the householder's lay conceptualisation of energy is likely to differ significantly from that of the expert. Parallels are found in the term 'environmental knowledge' used by anthropologists to distinguish traditional [lay] epistemologies from those of modern [expert] science (Spaargaren and Van Vliet 2000:80). Finally, cognitive capacity represents the ability of the householder to process information and the householder's associated tendencies. It is acknowledged that these three traits overlap to some extent and therefore some of the emergent concepts might also represent more than one trait in some aspects. However, to simplify explanation and to clarify the reader's understanding, each of the emergent concepts is discussed in terms of its influence on one of these areas only.

Self-interest

Self-interest is reflected in the themes 'opportunity', 'control' and 'responsibility'. The everyday householder looks for opportunities to fulfil self-interest, such as saving money through reduced fuel bills, increasing comfort, or increasing safety and convenience (through measures such as energy saving light bulbs on stairs). Where some kind of opportunity to fulfil self-interest exists, the householder is motivated to take responsibility for energy efficiency action. Responsibility, however, commonly becomes a barrier to action driven by climate change, as the responsibility for the global environment is seen to lie with government, rather than the individual. Where programmes offer the householder a degree of householder control, there is opportunity for the everyday householder's self-interest to be incorporated into the message. Householders can therefore potentially pursue genuine self-interest while also improving energy efficiency. Some providers, however, see householder control as a problem, as it provides opportunity for self-interest to result in a 'non-optimal' solution.

Energy knowledge

Energy knowledge is reflected in the themes 'visibility' and 'relevance'. The intangible nature of energy efficiency renders the concept difficult to comprehend by householders in the context of day-to-day life. Both the effects of energy efficiency (and inefficiency) and the energy efficiency measures themselves tend to be invisible. Those measures that are visible (such as double-glazing) are therefore more likely to be perceived by the everyday householder and related to the energy efficiency concept. Also, those facets of energy efficiency that are more tangible (such as associated safety and convenience) are more likely to be perceived than efficient use of energy itself. The householder's knowledge of energy efficiency might therefore be accessed more easily by treating energy efficiency as an add-on issue to other more tangible, known issues related to energy use. These are the issues that tend to be foremost in the minds of the householders and are thus perceived by the householders to be relevant to their everyday lives. The relevance of the message also depends on it making sense within the householder's particular circumstances (for example, the sense of an energy efficiency investment depends on the length of time the householder intends to live in the dwelling). This notion of making sense can contribute to the concept of a good idea, which in turn appeals to the lay perspective.

Cognitive capacity

Cognitive capacity is reflected in the themes 'direct approach', 'demonstration' and 'credibility'. Getting the message across potentially involves four stages: awareness-raising and interest generation; provision of information about 'solutions'; provision of information about taking action; the action itself. The extent to which the householder engages with these stages is limited by the householder's cognitive capacity, i.e. the everyday householder's ability (or tendency) to digest, comprehend and trust presented information. A direct approach refers to one which responds to the limitations of cognitive capacity (e.g. a tendency to lose interest) by focusing on providing access and opportunity to information and/or action. Having gained the householder's interest with information, this approach might facilitate action through the provision of a grant or an installer. Alternatively, it might seek to provide energy efficiency information at a time when relevant action is already being contemplated and might not otherwise incorporate energy efficiency. The everyday householder also seeks proof that presented information is valid and trusts only that which is delivered from a credible source. Credibility also depends on the perceived consistency of the message. Where

messages become mixed the householder will inevitably become confused and will tend to dismiss the presented information.

It is suggested that an understanding of these three characteristics of the everyday householder might hold the key to the design of a successful domestic energy efficiency programme for owner-occupiers, within a given set of external constraints.

4.5 Summary

4.5.1 An outline conceptual framework

Interpretation of the case study data has resulted in the development of a theoretical structure relating to engaging homeowner-occupiers in England in energy efficient home improvement. The core category 'getting the message across' was selected as the focus for the framework and has been chosen as the label itself. For the purposes of this framework, 'getting the message across' has come to represent the notion of a provider succeeding in engaging a householder in energy efficient home improvement, through a domestic energy efficiency programme. The provider might successfully send 'the message' via the programme, but from the perspective of the provider, it will only have 'got across' if the householder responds positively and acts on that message.

A number of major themes arose from the data and were refined in relation to the core category. The model represented in figure 4-2 summarises the theoretical structure, indicating a relationship between the provider, the energy efficiency programme and everyday householder and each party's relationship to particular themes. The apparently finite and inflexible format of the representation is not intended to signal that the framework is also finite and inflexible. As explained above, the researcher recognises the accounts gained through the interviews as one of a number of possible representations rather than as definitive versions of social reality. The outline framework developed from these accounts is not, therefore, a definitive structure of the condition that is being explored. This representation is intended only as a tool to simplify explanation of the framework and to clarify the reader's understanding. At this stage the framework is an outline only and the provisional definitions of and relationships between themes will be developed through the literature review and in empirical research phases 2 and 3. The reader is therefore asked to note that the condition that is being explored is more complex than figure 4.2 might suggest.

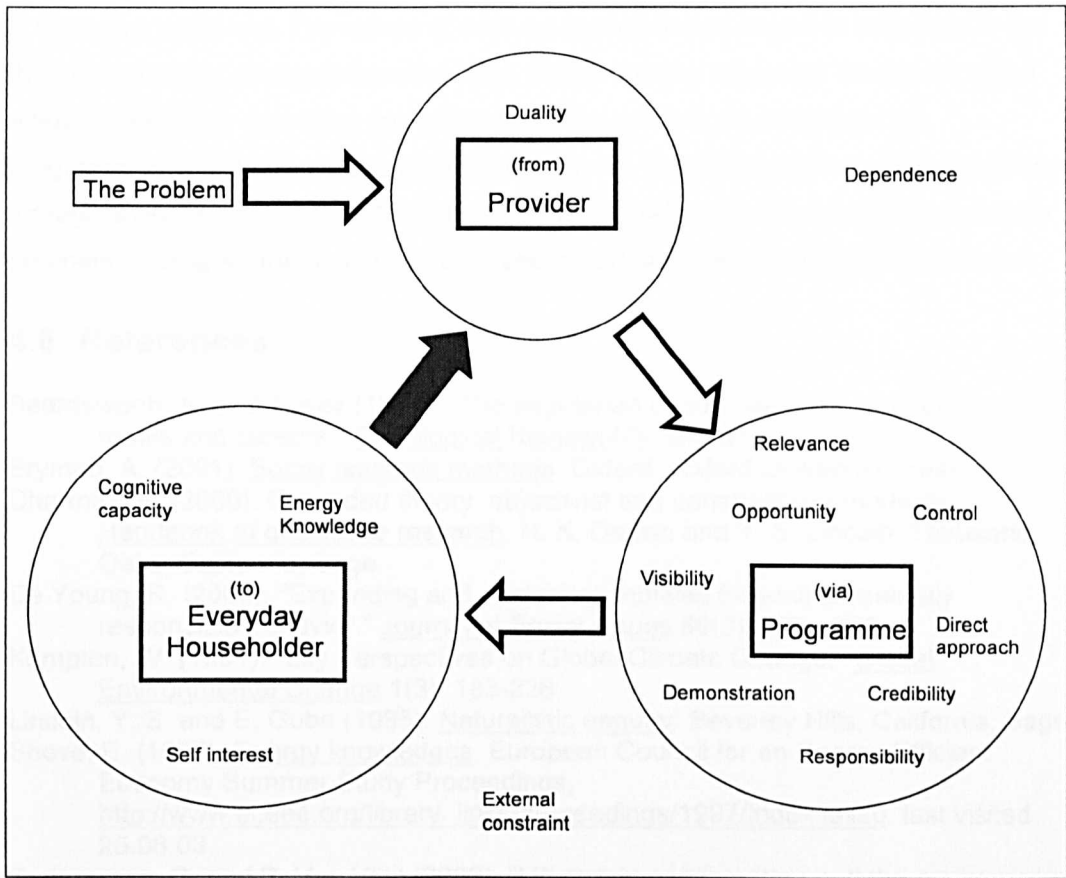


Figure 4-2: A representation of the outline conceptual framework: 'Getting the message across'

'Getting the message across' lies at the heart of the provider's view of the task they face in improving the energy efficiency of the owner-occupied housing stock. The message is conceived by the provider and delivered via a programme to 'the everyday householder'. This notion of the everyday householder reflects the providers' acknowledgement that their challenge is to get the message across to people who currently give little thought to energy efficiency and who have a different conceptualisation of energy efficiency. While no compulsion exists, the success of the message is dependent on the householder's compliance. The providers themselves and the programmes they drive are, therefore, limited by a condition of dependence.

In order to get the message across more effectively, this outline framework (see figure 4-2) highlights a need to focus on building an understanding of the everyday householder - her self-interests, energy knowledge and cognitive capacity - in order to ensure that the expert's message is compatible with the householder perspective. A householder-centred approach to domestic energy efficiency programme development

is therefore proposed. The nature of such an approach has begun to take form in the themes that have emerged from the data. These themes represent the issues which affect householder response and which therefore need to be addressed by programmes in order to ensure a positive outcome. The themes will be further explored through a review of literature. In particular, the key traits of the 'everyday householder', pertinent to programme design will be investigated and their implications discussed.

4.6 References

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5. Literature review: a conceptual framework for programme development

5.1 Chapter outline

In this chapter, relevant literature is reviewed in order to further develop the outline framework that emerged from case study data in chapter 4 (see figure 4-2). The review provides the theoretical underpinning of the thesis and a basis for further empirical study. The reviewed literature relates to the broad areas of energy use behaviour and the role of information in modifying this behaviour. Findings will be related, through discussion, to the specific context of energy efficient home improvement.

The outline framework, 'getting the message across' is used to guide the literature review, providing the critical framework for analysis and discussion of the findings (see figure 4-2). As proposed in chapter 4, the review focuses on exploring the notion of a householder-centred approach to the development of domestic energy efficiency programmes. In particular, the review aims to build an understanding of the 'everyday householder' within the areas of self-interest, energy knowledge and cognitive capacity, building on the themes that emerged in chapter 4. The theme 'external constraint' is recognised as important, however, further exploration is beyond the scope of this thesis¹. Suffice to say that the theme provides the context for the conceptual framework which is here being built and represents an acknowledgement that the choices and options available to the individual householder are in fact socially structured and hence limited (see for example, Cowan 1987; Shove and Guy 2000).

This review aims to:

- ensure that the developing theory is made more robust by accommodating the work of others;
- provide a conceptual framework for an effective information/advice programme to engage homeowners in energy efficient home improvement;
- identify themes that might inform the design and analysis of the empirical research to come.

¹ Further research would be warranted in this area and would merit another or even several PhD theses.

5.2 Energy behaviour research: towards a multidisciplinary research paradigm

This review draws on literature relating to energy use (the energy-related action of persons living in technology-rich environments, Lutzenhiser 1990:101) and relevant behaviour change techniques, primarily from the social and behavioural sciences, marketing research and more general evaluative research. The sources are rarely directly comparable², however, it is possible to identify general trends and discrepancies.

Since the mid-1970s a succession of established disciplines has sought to tackle the energy and behaviour 'problem', developing theoretical models of human energy-related behaviour grounded in the perspective of each particular discipline. The primary research perspective has shifted over time, beginning with voluntary conservation efforts, moving to physical aspects of energy efficiency and the engineering perspective, through to the economic, psychological and finally the social science perspective (see Lutzenhiser 1990).

Social-psychologists began work in this area as an attempt to enrich the rational-economic model of human behaviour. While the latter can predict behaviour in some situations, social researchers argue that it is inherently limited due to the conception of the human actor upon which the model is founded: a rational decision-maker, who always acts according to perception of self-interest. Social-psychologists instead argue that human behaviour is best understood as 'a coherent expression of personal desire' (Yates and Aronson 1983:435). This demands acknowledgement of the cognitive, social and personal forces that define a situation, in addition to the economic realities:

'...failure to reach conservation goals can no longer be viewed as a purely technical or economic problem. It is a people problem.' (Yates and Aronson 1983:436)

Drawing on social-, cognitive- and environmental-psychology, social-psychologists have developed alternative models of human energy-use behaviour rooted in theories of value, identity, attitude-behaviour, reasoned action and learning.

² For example, some studies explore factors relating to energy conservation behaviour, others focus on pro-environmental consumer behaviour and other sources specifically explore factors relating to the installation of domestic energy efficiency measures. There is also research that focuses on broader areas such as environmentally responsible behaviour.

While the social-psychologists have claimed to challenge the rational-economic view, their focus on individual attitudes and motivations reflects the fact that energy-saving action is still viewed as the consequence of informed rational action on the part of individual decision-makers (Shove and Guy 2000:64). In fact, it has been argued that these shifts in disciplinary focus represent no more than a successive refinement of the same techno-economic paradigm, since each remains founded on the same individualistic theory of choice and technical change (Ibid). This paradigm infers a linear model of technical diffusion, in which the technical expert defines the solution through a process of research and demonstration. This is then disseminated to the non-expert who is expected to apply the solution, i.e. take energy saving action. This model is founded on two assumptions: first, the well-established notion that technical representations provide a more complex and accurate picture of what is really going on; second, that translation of the expert's message is conceptually possible. On this basis, the only obstacle to the transfer of energy efficient technology (providing the expert has defined the 'correct' solution) is the 'irrational' behaviour of non-expert individuals. Informational campaigns are therefore supported in order to eliminate irrational behaviour. Energy research and policy has been dominated by this techno-economic model which has provided a 'mutually reinforcing package of beliefs' which Shove and Guy recognise has been 'strong enough to encapsulate technical researchers and policy makers, and elastic enough to span countries and continents.' (Ibid:63).

The dominance of this model has marginalised other models of technology transfer. However, some social scientists have drawn on alternative theories, which promote a conception of the individual as a 'member' of a social group (Lutzenhiser 1990:106). Drawing on fields such as sociology and anthropology, they have offered models of human energy-use rooted in theories of culture, evolution, social choice and lifestyle. Guy and Shove (2000:68) promote this theoretical reorientation towards a non-linear sociological model of technology transfer in the context of energy efficiency. This approach recognises science as a socio-cultural phenomenon and asks what role society plays in the type of technologies that are produced. Energy is described as the outcome of theoretical and methodological conventions, whether they be of the expert or non-expert realm (Ibid:48). Guy and Shove suggest that technical researchers (experts) inhabit an epistemological domain of their own making which is necessarily and deliberately cut off from the non-expert domain. Each domain therefore has its own rules of description, and hence there can be no simple process of translation from one to the other. This suggests that the techno-economic model of technology transfer is

fundamentally flawed. Instead, the adoption of a non-linear model founded on alternative sociological theory permits one to 'leap the barriers': no longer is there an assumption that translation is necessary; no longer is the non-expert individual viewed as the barrier to success.

It has been argued that in fact of the 'physical', 'rational' and 'psychological' conceptions of human action none has produced a model of human energy-use which accurately predicts observed behaviour or level of energy consumption (e.g. Lutzenhiser 1990:106). The rational-economic view of the energy user has been described, not only as a 'poor fit' to reality, but also as misleading, since it creates conceptual 'blind spots' in analysis (Stern 1986). In addition to existing in a 'social vacuum' (Spaargaren and Van Vliet 2000), psychological research has been criticised for not linking conservation attitudes with energy consumption and for all but ignoring the role of money, cost and calculation in human action (Lutzenhiser, opcit:106). Neither have the social sciences escaped negativity, being criticised for the 'poor job' that has been done in incorporating the physical and economic worlds (Ibid:107).

Reflecting on the failings of each disciplinary approach, Lutzenhiser envisions an integrated theoretical model that acknowledges the contributions that can be made by theories of lifestyle and culture, by physics and engineering, social scientists and psychologists. More recent literature reflects a clear trend towards such a multidisciplinary approach to energy-use behaviour, as part of the wider study of environmentally responsible behaviour (ERB). A number of researchers have begun to synthesise the primary research perspectives identified above in order to advance new conceptual and theoretical frameworks (see e.g. Cook and Berrenberg 1981; Dwyer, Leeming et al. 1993; Geller 1995a; Shove 1995a; Stern 2000; Zelezny and Schultz 2000; Wilk 2002).

It is proposed that this trend towards a multi-disciplinary view of energy-use behaviour represents a paradigm shift in which the everyday person, alongside the expert, is granted a role in determining investigation. In the case of the expert-centred techno-economic paradigm, the energy user is conceptualised as the primary barrier to implementation of the expert solution. By contrast, the emerging paradigm conceptualises the everyday energy-user as an integral part of the solution. The techno-economic paradigm and its associated linear model of technology transfer are therefore challenged and a non-linear model is proposed.

Lutzenhiser's vision of a new research paradigm supports this proposal. Rather than assuming normalcy, need and rationality, this paradigm would ask questions about 'how persons actually value objects and outcomes in the energy arena, how they behave in real markets, and how they interact with real machines.' (Ibid:107) At the heart of this research paradigm, therefore, is the notion of a 'real' person in a 'real' context. This notion echoes the concept of the 'everyday householder' introduced in chapter 4.

The following literature review summarises the primary perspectives of earlier expert-centred disciplinary research where appropriate, but explores in more detail key issues that have emerged from relevant multi-disciplinary research frameworks as they relate to the everyday householder. The literature is synthesised through further development of the themes presented in the outline framework, ultimately focusing on the point at which the everyday householder and the behaviour change programme interact, in order to develop recommendations for an effective information/advice programme for domestic energy efficiency.

5.3 Self-interest

5.3.1 Introduction

This section explores the everyday householder's self-interest as a potential source of motivation for energy efficient home improvement. De Young (2000:509) points out that the majority of work relating to the motives for ERB has been confined to the study of two motivation-types: material incentives (and disincentives); and altruism. The focus on these two motivation areas reflects the view that environmental protection is a social dilemma: i.e. collectively we are better off if the environment is protected, but rational self-interest often dictates environmental exploitation (Gutierrez Karp 1996). On this basis, environmental concern and related behaviour have traditionally been associated with social-altruism (Schwartz 1970; Schwartz 1977), while self-interest has generally been seen as a source of environmental problems (Hardin & Baden 1977, Mansbridge 1990 cited in De Young 2000:514). However, where the individual benefits of environmental behaviour are expected to outweigh the costs, self-interest can also generate concern (Stern, Dietz et al. 1993:326) and might potentially motivate action.

Within the social dilemma perspective, self-interest clearly focuses on short-term individual or familial gain to the exclusion of long-term societal or environmental

benefits (Low and Heinen 1993: cited in De Young 2000:514). Where the expected costs outweigh expected benefits of ERB, self-interest, therefore, becomes a barrier to overcome. This can be achieved either by appealing to the individual's altruistic commitment to the collective goal (inferring individual sacrifice) or by manipulating self-interest motives by introducing material reward. However, each of these motivational approaches has inherent drawbacks, as will be discussed below. A more positive perspective sees self-interest not as a selfish desire to enjoy more, but rather an innate tendency to protect and further one's self. It has been argued that the intrinsic satisfaction gained from pursuing this conception of self-interest is far more durable than any extrinsic satisfaction from material incentive (see De Young 2000:515). In addition, there is no need to equate ERB with sacrifice.

The potential to motivate householders to pursue self-interest, as a means to engage householders in ERB, is explored. Each of the two alternative conceptions of self-interest outlined above is addressed. The implications of each conception are discussed in as far as they might inform the focus of the message content to be delivered by programme providers and thus aid the process of getting the message across.

5.3.2 Opportunity: personal gain

Many UK domestic energy efficiency programmes are driven primarily by the problem of climate change and associated environmental degradation (see appendix B). However, informational programmes rarely rely on altruistic environmental commitment to motivate a positive reaction. Most in fact promote rational self-interest, either instead of or alongside the goal of environmental protection. In the light of the social dilemma identified above, this juxtaposition perhaps appears to create a conflict. However, a number of domestic energy efficiency outcomes can be perceived to be in the interest of individual households.

Three main personal gain outcomes emerge from the reviewed programmes: saving money, saving energy (closely related to saving money according to BJM 1999) and improving comfort. According to UK householders themselves, saving money is one of the main factors to motivate domestic energy conservation and installation of energy efficiency measures (e.g. Olsen 1981; Hedges 1991; Green, Darby et al. 1998; Sadler and Hamlyn 1998). While some people actually aim to reduce spending, others just want to stop it 'running away' (Hedges 1991). One study, however, revealed saving money to be the most popular *secondary* reason to install measures and among

primary reasons, 'keep heat in', 'save energy' and 'needed replacing' were more important (BJM 1999).

'Keeping the heat in' is perhaps a concept closely related to comfort - also frequently cited by householders as one of the most important motivating factors (DoE 1994; DoE 1996a; Green, Darby et al. 1998; Sadler and Hamlyn 1998). Insulation installers found that this had far more attraction to householders than the science of energy efficiency, payback period, or the size of the fuel bill (Shove 1991). In a study for the EST, almost everyone who had adopted energy efficiency measures stated comfort along with low fuels bills and convenience as a reason for their action (BJM 1999). Pensioners generally gave priority to comfort, presumably because they spend a great part of their time at home. Convenience here referred to things such as ensuring that there was always enough hot water and that facilities were responsive and controllable. Few other surveys have found this factor to be a high priority, as perceived by householders. Probably the next most common reason to install energy efficiency measures after money/energy saving and increased comfort, across the UK surveys, was the fact that something needed replacing. This is closely related to the also popular factor of timing. Where major home improvement work is already being carried out, it is often the case that energy efficiency measures can be incorporated with little further inconvenience.

Other (much less popular) personal gain factors mentioned by householders include the following: the fact that there was an associated grant; the work was free or on offer; and the measures added value to or improved the home. Finally, one researcher suggested that health could potentially be a more powerful motivator, although at the time it was uncommon for respondents to raise the issue in this context (Hedges 1991). Research suggests that personal consequences relating to one's health can be a critical factor in predicting actual reductions in household energy consumption (Olsen 1981) and hence it is suggested that this area warrants further investigation.

Personal gain outcomes can be seen to represent a type of incentive for householders to engage in energy efficient home improvement (EEHI). Alternatively, additional incentives, such as cash-back schemes, may be offered. Although monetary incentive has been shown to be effective in initiating ERB, many studies have found that behaviour returns to pre-incentive levels once this reinforcement ends (see e.g. Katzev and Johnson 1987; Dwyer, Leeming et al. 1993). Domestic energy efficiency, however, provides the advantage that once a measure is installed, the energy efficiency level of

the dwelling is increased indefinitely and the potential to achieve associated energy, environment and personal benefits remains constant. Thus it is proposed that incentives might prove to be more effective in the context of domestic energy efficiency as compared to other so-called environmentally responsible behaviours.

5.3.3 Altruism

Both self-interest and altruism have been related to value-orientation. Schwartz (1992) arrays values on two principle dimensions. First, self-enhancement - self-transcendence; this dimension reflects the distinction between values orientated toward the pursuit of self-interest and values related to a concern for the welfare of others (Gutierrez Karp 1996:113). Second, openness to change – conservatism; this dimension indicates the degree to which individuals are motivated to independent action and willing to challenge themselves for both intellectual and emotional realisation (Ibid:114). On this basis, Schwartz derives ten motivational value types, building a model which assumes that people act on social-altruistic values, judging phenomena on the basis of costs or benefits for the human group (Stern and Dietz 1994:70). (See also Schwartz 1970; Schwartz 1977).

Recent research has identified an ecocentric form of altruism in addition to the sociocentric, indicating a tendency to be concerned about the plight of the earth and non-human species (Stern, Dietz et al. 1993; Stern and Dietz 1994). Both socio- and eco-centric values have been shown to exert a positive influence on environmental behaviour (Eckersley 1992; Gutierrez Karp 1996; Schultz 2000). However, since value orientations are thought to flow from human socialisation (Stern and Dietz 1994:67), their manipulation via information is unlikely to offer a means to motivate ERB. It has been suggested that social structure must change first (Banks 1999a).

Even if value manipulation were possible, it has been suggested that altruism may be 'a fatal remedy' (Sieber 1981, cited in De Young 2000:510). Central to the definition of altruism traditionally used in the context of ERB is the idea of sacrifice and behaving *counter* to one's self-interest (see Schwartz's first value dimension above). Kaplan suggests that the 'negative pay-off' focus of this definition creates serious motivational issues that bring into question the strategic usefulness of the altruism concept (Kaplan 2000:494). While ERB is perceived to be associated with sacrifice it communicates a powerful message (if unintended) that ERB inherently leads to a reduction in quality of life (Ibid). This conflicts with the human characteristic to hope for a better future, common across a wide range of cultures (Cantrill 1966, cited in Kaplan 2000:495). It is

suggested, therefore, that any programme which appeals to altruism in the traditional sense, effectively asking householders to sacrifice their quality of life, will struggle to succeed.

5.3.4 Opportunity: intrinsic satisfaction

The traditional definition of altruism relies on an understanding of self-interest to be a selfish pursuit of relatively short-term individual or familial gain. This notion of self-interest plays a key role in the definition, in that it represents everything that altruism is not:

'Altruism is defined as feeling or acting on behalf of the welfare of others in cases where self-interest could not be involved' (Jencks 1990, cited in Kaplan 2000:494)

Some, however, acknowledge the possibility that self-interest and altruism might work together. Mansbridge (1990:133, cited in Kaplan 2000:496), for example, writes that 'altruism must coincide with self-interest sufficiently to prevent the extinction of either the altruistic motivation or the altruist.' Kaplan takes this notion further in an attempt to remove the dichotomy altogether, citing examples where those who exhibit altruism with regard to the environment in fact experience personal benefits from nature (Kaplan and Kaplan 1982 cited in Kaplan 2000:496). In the UK it has been shown that some householders are motivated by both the altruistic outcome *as well as* personal gain outcomes (See Stern, Dietz et al. 1993; Stern and Dietz 1994; BJM 1999; Fusco 1991, cited in De Young 2000). Since coincidence between self-interest and altruism is impossible according to traditional definitions, it is necessary to adopt an alternative conception of each of these terms.

First, self-interest. Although self-interest is commonly recognised as a powerful force underlying human behaviour, Perloff (1987) highlights the fact that it is often mistakenly equated with mean-spirited selfishness. Thus 'its influence on performance in and adjustment to all aspects of life are frequently underestimated and discredited.' (Perloff 1987:3) On the basis of Perloff's argument it is both possible and also profitable to distinguish self-interest from selfishness:

'...selfishly consuming resources or creating waste without concern for others is quite different from taking care of yourself and maintaining your ability to function effectively in a challenging and frequently chaotic world.' (De Young 2000:515)

Neither is self-interest about attaining personal happiness at the expense of others; in fact individual happiness can depend on what happens to those about whom we care (Wallach and Wallach 1983, cited in De Young 2000:515). In summary, happiness, or a sense of satisfaction, can be derived from any outcome we care about. As such, self-interest can be tied to a vast number of concerns, many directly relevant to the promotion of ERB (De Young 2000:515). Second, altruism. If self-interest is no longer equated with 'mean-spirited selfishness', then the traditional definition of altruism is rendered invalid. Instead, altruism is seen to involve getting pleasure from helping behaviour (Ibid:516). In this way, it is conceptually possible for one's self-interest to support 'altruistic' behaviour.

These alternative conceptions of self-interest and altruism offer a number of benefits. First, there is no requirement to ask householders to make sacrifices for the environment— an approach which inherently conflicts with the human motivation to forge a better life. Second, there is no need to rely on either a 'selfish' personal gain outcome from ERB, or a pro-environmental attitude. Reliance on the latter has, in any case, been shown to be flawed in the many instances where only a weak correlation (or even a discrepancy) between environmental attitude and associated behaviour has been found (see Olsen 1981; Ritchie, McDougall et al. 1981; Scott and Willits 1994). Instead, potential exists to promote EEHI (as a form of ERB) via the sense of satisfaction to be gained from engaging in such helping behaviour.

The form of self-interest focused upon here is intrinsic satisfaction (De Young 2000) i.e. personal internal contentment derived from engaging in particular behaviours. Four categories of intrinsic satisfaction relevant to ERB emerged from nine studies by De Young (De Young 2000:516): satisfaction derived from behavioural competence; participation in maintaining a community and making a difference; frugality; and pleasure derived from luxury. These categories are explored further below.

5.3.5 Competence (or efficacy)

Competence (also referred to as efficacy) is cited as a basic human concern (White 1959, cited in De Young 2000:517; Kaplan 2000) and there is evidence to suggest that this is a primary source of motivation (see Leff Gordon et al. 1974, cited in De Young 2000). Humans strive to increase their effectiveness in their interactions with the environment and enjoy being able to solve problems and complete tasks (Ibid). This has implications in the context of ERB, which have been explored by a number of authors (Geller 1995a; Geller 1995b; De Young 2000; Kaplan 2000). It has been shown

that enjoyment can result from a sense of competence, specifically in the context of ERB (De Young 2000:517). De Young found that competence was generally the most highly endorsed of all intrinsic satisfactions (ibid). However, it is important to note that context plays a key role in whether or not one can use or further one's competence. People will avoid situations where this is not possible; for example, where there is a lack of procedural knowledge, where the individual simply does not know what to ask or even where there is too much information (Kaplan and Kaplan 1982; De Young 2000:521). When this occurs, people tend to feel incompetent or helpless – both being states which people hate and which have strong behavioural and motivational implications (Kaplan 2000:498). In fact, it has been shown that those who feel a sense of helplessness are less likely to participate in ERB than those who feel their action will benefit the environment.

Studies confirm that those who lack procedural knowledge or access to a behaviour (e.g. via curbside recycling schemes etc.) are less likely to take pro-environmental action (De Young 1989; Vining and Ebreo 1990; Humphrey et al. 1977, Jacobs et al. 1984, Luyben & Bailey 1979, Reid et al. 1976, Witmer & Geller 1976 all cited in Oskamp, Harrington et al. 1991; Derksen and Gartrell 1993). The level of inhibition or facilitation that householders perceive to result from such situational factors has been shown to override the effects of personal dispositions such as general environmental attitudes (De Young 1989; Guagnano, Stern et al. 1995; Corraliza and Berenguer 2000). Even in cases where householders have a negative attitude to a particular behaviour, some will engage in that behaviour if procedures are made clear through provision of access and opportunity (De Young 1989; Corraliza and Berenguer 2000)³. Therefore, while general environmental attitudes are rarely able to predict ERB, competence (Corral-Verdugo 1997), and the situational factors supportive of competence, can successfully do so.

5.3.6 Participation (or control)

Participation can provide a motivation for human behaviour and offer a means to counter the potentially negative effects of perceived helplessness and incompetence. Kaplan (2000) sees participation as being different to the notion of control: while people dislike feeling helpless, the opposite of helplessness is not necessarily control. People may want things to be *under* control, but they do not necessarily like the idea of the associated effort and responsibility necessary in *taking* control (Kaplan 2000:503). However, genuine participation (as opposed to a token activity) is felt by many to be

³ The possibility of social pressure in contributing to positive action is also noted.

satisfying and empowering (Kaplan and Kaplan 1989, Wandersman, 1979, cited in *Ibid*:503). Kaplan draws on cognitive science and human evolution to identify the innate tendency of people to want to play a role in what is going on around them. Therefore, central to the attraction of participation is a sense of being needed and being able to make a difference (Kaplan 1990; De Young 2000; Kaplan 2000).

Research shows that energy programmes are more effective where householders are allowed to play an active participatory role, e.g. by setting their own goals voluntarily (Constanzo, Archer et al. 1986). Yates and Aronson (1983:442) highlight the importance of choice and what they choose to call control, in their recommendations to improve the effectiveness of a particular home energy audit programme. Drawing on social psychological research, they note that feelings of choice and control are important determinants of happiness and behaviour; allowing people to make choices in simple situations can thus have powerful results. Even where the outcome of the choice is relatively inconsequential, the process of decision-making can have a powerful impact on people. They therefore recommended that the audit programme be structured to allow the customer as much decision control as possible (*Ibid*). If the customer is more interested in solar technology than weather stripping, they say, this should not be discouraged – the initial focus of interest can act as the ‘foot-in-the-door’. Festinger’s theory of cognitive dissonance suggests that larger, ongoing commitments can be obtained from people by first soliciting a smaller commitment – the foot-in-the-door technique (Freedman & Fraser, 1966, cited in Yates and Aronson 1983). This principle is highly relevant to domestic energy efficiency and there has been evidence of its success in this context (e.g. Palmer 1997:9)

In summary, there is evidence that permitting the active participation of the householder in the energy efficiency advice process, e.g. in setting targets and making choices, will make the programme itself more effective.

5.3.7 Frugality and luxury

De Young found that frugality was perceived by participants to be a satisfying activity worth pursuing in its own right. This, he concludes, shows that frugality can bring personal satisfaction (De Young 2000:520). This type of intrinsic satisfaction could explain the motivational power of waste avoidance, identified in many studies (e.g. Hedges 1991). Many people seem to have a strong aversion to waste and even feel guilty about it, suggesting that waste avoidance does not offer the attraction of personal gain. Hedges suggests that the issue is more moral than practical. In general, older

people are more likely to be bothered by waste, since consumption rather than thrift is the prevailing ethos (Hedges 1991; BJM 1999). However, a more widespread related trend has been noted where householders are inclined to be more motivated to avoid loss (especially financial) than to make savings (see Kahneman & Tversky 1979, Yates 1982, cited in Stern 1992:1227). This suggests that programmes promoting domestic energy efficiency should seek to frame potential savings as avoided waste wherever possible.

Luxury perhaps infers the opposite to frugality. De Young defines this category as 'the satisfaction gained from having both the conveniences of our modern society and access to new and novel products.' (De Young 2000:520) A notion of ERB which relies on the idea of personal sacrifice (for example, sitting in the cold in the dark), would clearly be incongruent with luxury. However, energy efficiency, in contrast to other behaviours to conserve domestic energy, is associated with the adoption of new products. Energy efficient products therefore potentially offer the opportunity to gain satisfaction from luxury. This potential rests on the householder's perception of energy efficiency and associated products. De Young found that not only did householders derive satisfaction from luxury in the context of ERB, but they perceived no inherent conflict between ERB and enjoying a modest level of well-being (De Young 2000:520). This suggests that domestic energy efficient products might similarly be attractive to householders on grounds of the novelty and the convenience they offer. Since neither of these traits inherently conflicts with the notion of frugality, it is suggested that the pursuit of EEHI might potentially support the satisfaction derived from both frugality and luxury. Luxury is explored further in section 5.4.4.

5.3.8 Responsibility

Where an energy-related behaviour change programme is driven primarily by a need to alleviate climate change, it is ultimately inferred that this, at least in part, is the responsibility of the householder since he or she is expected to take action in response to the message. Among UK householders, however, there is a general belief that energy efficiency, as a means to reduce environmental impact, is first and foremost the responsibility of central government (Hedges 1991; BJM 1999), local government and business (MacNaughton 1997).

Though one study found that most people accept some responsibility for improving the environment and quality of life, this tended to be only related to action at a local level (MacNaughton 1997). People feel that, in the context of the quantity of energy

consumed by large-scale industry and business, their own consumption is negligible. Inevitably, this leads to a belief that any efforts on their part will also result in minor and insignificant reductions in consumption (Hedges 1991; MacNaughton 1997; BJM 1999). This lack of perceived personal efficacy, in effect, means that householders feel helpless and unable to exhibit competence. Hence people generally feel either unable or unwilling to take personal responsibility for addressing the associated problems (Harrison 1996:225). There is evidence to suggest that perception of individual responsibility and of the effectiveness of individual action are indeed significant factors when it comes to taking pro-environmental action (Ristic 1999).

A general lack of faith in government is found in Britain, with the 'political system' being perceived as the problem (MacNaughton 1997). This lack of trust relations between citizens and government has been identified as a major constraint inhibiting the acceptance of personal environmental responsibility (Harrison 1996). Banks (1999b) suggests that the stratified society and the remoteness of government might be at the root of the problem. He points out that in countries such as Scandinavia, Holland and Germany, where power is devolved to lower levels, the people seem more willing to comply with government objectives and are thus more prone to heed pleas to save energy than the British. This proposal is in part supported by a study in Sweden which found that the most common solution to global warming offered by the public concerned individual action (Lofstedt 1992:170) and another in Austria where most people offered a combination of individual and collective actions (Lofstedt 1993).

The two versions of self-interest that have been outlined in this section take different approaches to responsibility. First, the tactic of motivating householders with the promise of a personal gain outcome bypasses the environmental problem altogether. In this way, householders are effectively only asked to take responsibility for their own selfish self-interests, thus avoiding any potential barriers associated with perceived environmental responsibility. The second approach, rather than avoiding the issue of environmental responsibility, sees this as a means to pursue self-interested needs. In taking responsibility for alleviating the environmental problem, the householder is able to derive satisfaction from taking care of herself and maintaining her ability to function effectively. Thus, personal responsibility becomes an inherent part of intrinsic satisfaction, and hence of self-interest.

5.4 Energy knowledge

5.4.1 Introduction

'Getting the message across' requires not only that the content of the message is motivating, but also that the message is framed in such a way that it is perceived to be relevant by the everyday householder. Part of the difficulty in achieving this lies in the fact that the expert provider (who conceives the message) and the everyday householder (who receives) have different knowledges of energy, energy use and energy efficiency.

Although energy is a fundamental part of all of our lives, what counts as energy is not clear-cut. Energy knowledge is a concept which rests on the idea that what counts is that which is known and experienced (Shove 1997:2). However, the intangibility of energy itself renders it difficult to know, since it is never experienced directly. By extension, it also becomes difficult to know energy consumption and energy efficiency. The expert is able to draw on an understanding of invisible processes and appropriate terminology to conceptualise energy, its use and its conservation. Everyday householders, on the other hand, while it is possible that they too will understand expert vocabulary, will not necessarily find meaning in these concepts *within the context of their everyday lives*.

In chapter 4 it was observed that there were essentially two approaches to enabling comprehension of the message: either changing the householders' perspective by attempting to teach them to speak the experts' language; or drawing on the householder perspective to construct a message using the language that they already understand.

Taking the latter approach as the point of departure, this section explores the meaning that the everyday householder finds in energy, energy consumption and energy efficiency through experience and accumulated knowledge. Also explored are the effects of lifestyle and culture on the meaning perceived by the householder to be imbued in energy-related behaviour and products. The implications of the disparity between the expert and the lay view are discussed in the context of the development of future programmes. In particular, the discussion focuses on implications for the *framing* of the message in order to render it understandable and meaningful from the everyday householder perspective.

5.4.2 Visibility

The invisible nature of energy means that the closest the householder comes to actually seeing energy consumption is through bills and energy meters. These abstract representations are a poor substitutes for actual experience: in the end, belief in the reality of energy consumption essentially requires an act of faith (Shove 1997:1). With an increasing number of people relying on a direct debit payment system and few actually reading their meters, there is little to link even these abstract representations of energy consumption to concrete everyday activity. Householders therefore tend to be unaware of the effects of their domestic behaviour patterns on levels of fuel consumption. That visibility affects the householder's energy knowledge is confirmed by the fact that people tend to overestimate energy use for those appliances that are visible and underestimate use for those that are hidden (see Stern 1992:1227). In a similar vein, householders tend to overestimate the positive effects of visible energy conservation practices (see Dennis 1990:1114) and underestimate the effects of invisible energy efficiency measures, such as cavity insulation (Kempton, Harris et al. 1990).

'Energy' does not tend to be thought of by everyday householders in terms of bills and meters. Neither is it a single integrated concept for most people, but an abstraction which covers different aspects of experience (Hedges 1991). When people buy 'energy', they in fact look to buy warmth, light and other such services that it offers (Ibid; Shove 1997; Shove and Wilhite 1999). The consumption of energy, or rather, the paying of energy bills, plays a role in maintaining an expected standard of experience: i.e. it is a means to an end, not an end in itself. The meaning of energy consumption for the householder, therefore, lies in the kind of experiences that it offers to the householder in the home setting and the needs and desires that are simultaneously met.

Since householders link energy consumption with experiences of warmth and light, appeals to reduce consumption can be interpreted to mean a reduction in quality of life. Energy conservation can therefore have connotations of doing without; of sitting in the dark freezing. This negative vision is one which De Young (2000) seeks to avoid by redefining both self-interest and altruism (section 5.3.1). Energy efficiency, however, does not tend to be thought of in terms of sacrifice. Although there are cases where energy efficiency *has* been associated with being miserly and doing without, the concept in general tends to be thought of as 'a good thing' (Hedges 1991).

Like energy, energy efficiency is invisible, intangible and difficult to encapsulate. The term is widely recognised, but again does not tend to communicate one concept, instead meaning different things to different people (Hedges 1991; BJM 1999). Despite a lack of understanding and apparent confusion among householders (Hedges 1991; Kempton 1991:203), these different meanings tend to be positive. For some, energy efficiency means saving money, for others it is about lowering bills and for others, particularly older respondents, it is about 'not being wasteful' (Hedges 1991). These positive meanings suggest that there is indeed potential to encourage householders to engage in domestic energy efficiency on grounds of self-interest – whether for personal gain or for intrinsic satisfaction. In general, however, so-called 'normal' people are not thought to have a great deal of interest in energy efficiency and the limited salience of energy information has been identified as a barrier to energy efficient choice (Anderson and Claxton 1982). This notion is reinforced in the Hedges report (op cit) which surmises that, 'the public do not currently regard energy efficiency as something that deserves their attention and there is virtually no sense of any effort to encourage greater efficiency with energy.' There is an apparent contradiction in the fact that energy efficiency is considered 'a good thing' and yet this good thing does not deserve attention. Part of the problem could lie in a lack of perceived personal responsibility (see 5.3.8). However, it is proposed that the framing of the message from the expert perspective might also pose a significant problem. The challenge for providers therefore becomes one of framing the message so that it is relevant to the everyday.

5.4.3 Relevance

In order to ensure relevance, it is necessary to first discover where the meaning of energy-use lies for the householder and then establish links between this and energy efficiency. Coltrane et al. (1986), in reviewing a range of successful energy conservation programmes, recommend the use of personalised information to increase the salience of energy information. This personalisation would offer the opportunity to ensure that the particular energy-related needs of an individual - those that hold meaning - are met. More importantly, it would allow the provider to ensure that the message is framed in such a way that the householder *perceives* the potential of energy efficiency to meet these needs and hence perceives its relevance.

There is consensus in the literature that energy advice is most effective if tailored to the specific needs and also to the understanding of the client (Salvage 1992; Stern 1992; Lutzenhiser 1993; DoE 1996a; Green, Darby et al. 1998; JRF 1998). On the one hand, the specific needs of particular groups can offer an opportunity to 'sell' particular

devices – perhaps drawing on those issues that are 'foremost in the mind'. For example it has been suggested that elderly people might be more receptive to energy saving light-bulbs (CFLs) because they are likely to want bulbs which do not require frequent changing (Palmer 1997:10). On the other hand, certain client types present a need for energy advice which targets specific problems (see e.g. Green, Darby et al. 1998).

In order to access everyday meaning it is essential to frame the message using accessible language and concepts familiar to the householder. Highly technical language can deter action (Green, Darby et al. 1998). Instead, one needs to be aware of the discourse that characterises domestic energy within the household setting. Taking the term comfort, Shove provides examples of the 'proxy measures' that represent this term for individual householders (Shove 1997:4). Phrases such as: how near the window can you out the settee?; how long is it before you need to put on more than a dressing gown? Shove highlights the importance of recognising the gap between the expert and the layperson's energy knowledge and proposes that in fact:

'...the future of conservation depends, in part, on modifying the interface between lay people and professional languages of energy use and of giving consumers a "better" idea of what is going on.' (Shove 1997:2)

S. and R. Kaplan propose the Reasonable Person Model as an alternative to Rational Man, suggesting that this might inform the development of more effective energy information and participation programmes (Kaplan and Kaplan 1989; Kaplan 2000). A key trait of this model is a devotion to building mental models and actively seeking to understand the world (Kaplan and Kaplan 1989:61). In the light of this trait, it is suggested that any new information presented to a lay audience needs to be related to what is familiar to the individual, by taking advantage of pre-existing cognitive structures (Ibid:81). In essence, this means first valuing and then building upon the existing knowledge of the householder using familiar language and concepts. Such an approach suggests a process in which the provider both draws on the dual perspective (identified in the outline framework) and also affords the householder an active participatory role to enable dialogue.

In an attempt to facilitate the process of tailoring information and advice, programme developers have drawn on an approach called 'market segmentation'. Used in marketing, the process involves labelling the householder according to a sub-group

(often defined by lifestyle-type – see 5.4.4), which, in turn, tells the provider something about the likely needs, desires, worldview and attitudes of the individual. While some common demographic categories do display patterns in energy behaviour and consumption, many display irregularities, rendering them inadequate for use in applied research. Market segments and lifestyle groups, on the other hand, cut across the demographic categories. A range of classification schemes has been proposed. For example, in the mid-eighties the Electric Power Research institute (EPRI) proposed five basic consumer types (comfort seekers, strivers, indifferent consumers, control seekers and non-conformists), specifying marketing approaches appropriate to each (Lutzenhiser 1993). (See also the 'nestbuilders' of Wilhite and Ling 1990; Melasniemi-Uutela 1993; Mintel 1997; Sadler and Hamlyn 1998; BJM 1999) The application of market segmentation to the design of energy information initiatives has so far been limited. While segments and lifestyle groups, such as those outlined above, have been used to identify obstacles to domestic energy efficiency, they remain primarily descriptive. The notion of lifestyle and its implications will be explored further in section 5.4.4.

5.4.4 Lifestyle and self-identity

The symbolism that the householder associates with energy-related practices and products is associated with 'lifestyle'. This term has been borrowed from marketing research and is widely used by energy researchers to refer to patterned differences in behaviour and resulting consumption among sub-groups of society (see 5.4.3). It has been used variously to refer to a combination of culture, social class, consumer choices, behaviour and historical trends (Kempton 1993:221). Therefore, lifestyle difference, like cultural difference, is connected to social groups and has been shown to be associated with varying energy consumption levels (Lutzenhiser 1990). According to Lutzenhiser, levels of consumption are 'influenced by the wide variety of, technological, ideational, and behavioural resources that these "recipes for living" require their adherents to deploy in their everyday lives.' (Lutzenhiser 1990:108)

Spaagaren and Van Vliet (1995; 2000) expand the definition of lifestyle within the context of ERB. Drawing on Giddens's structuration theory, beliefs, (personal) norms and values, rather than belonging to the individual (as has been assumed so far in this discussion), are viewed as the rules which belong to a specific social practice that is shared with others (Ibid:53). The term lifestyle is used to refer to the process of integration of the variety of social practices that people experience in their daily lives:

'A lifestyle can be defined as a more or less integrated set of practices which an individual embraces, not only because such practices fulfil utilitarian needs, but because they give material form to a particular narrative of self-identity.' (Giddens 1991:81, cited in Spaargaren and Van Vliet 2000:55)

Individuals, therefore, seek to express their self-identity through their lifestyle – the more coherent their lifestyle, the more credible their identity.

Clearly, ERB is included within the set of social practices that make up one's lifestyle. Of particular interest here is the potential for the meaning imbued in domestic energy efficiency measures themselves to offer a narrative of self-identity. As Banks notes, since humans are cultural creatures, not isolated automata performing cost-benefit analysis before each decision '...you need to ask what the acquisition of [energy] efficient products actually means to people – in the symbolic realm...' (Banks 1999b). It has frequently been observed that consumers tend to be much more interested in technology such as solar panels than in insulation and weatherstripping, even though the latter are more cost effective. Solar panels have been described as being relatively glamorous and sexy in the world of energy-saving devices (Yates and Aronson 1983). Yates and Aronson believe that one of the tasks for social psychologists is to unpack the term sexy. In the context of solar technology they suspect that one of its meanings is 'visible, positive and dramatic':

'Solar collectors on one's roof are a far more dramatic demonstration of one's smartness and patriotism.' (Aronson and O'Leary 1983:441)

That solar collectors are 'visible, positive and dramatic' appears to be significant because these qualities enable the owner of the panels to mark their status in a dramatic fashion – a practice common across cultures (Douglas and Isherwood 1979). However, most domestic energy efficiency devices send only weak signals to others, since they, like energy and energy efficiency itself, tend to be invisible.

According to Banks (1999a who cites Gundelach and Laessoe, 1995), the symbolism of efficiency in the demonstration of status or membership of a social group is inherently weak and ambiguous:

'In short, energy-efficient products generally make poor props for showing off conventional socio-economic success. Somehow they just lack street cred.'
(Banks 1999b)

Not only do the products tend to be invisible, so too are their effects. Energy efficiency, by definition, allows for the same service for less energy, hence having no impact on those tangible, experiential (and meaningful) aspects of energy use. Also, many measures, such as appliances and lighting, are considered necessary possessions rather than luxuries, thus communicating little about status and wealth (Banks 1999a).

The invisibility of most energy efficiency measures cannot be overcome. However, it has been noted that there may be potential for some products to be considered luxuries rather than necessities, simply as a function of their energy efficient status (Ibid). This proposal is supported in section 5.3.7. It has been suggested that there may also be a role for energy efficient alternatives in building and maintaining a personally negotiated identity (Greer 1996, cited in Banks Ibid). In fact, self-identity has been shown to have a substantial independent effect on behavioural intention in the context of 'green' consumerism (Sparks and Shepherd 1992); an area which is not traditionally associated with socio-economic status and wealth. Personal definitions of self (like lifestyle groups) can cut across conventional social categories (e.g. caring person, technically aware handyman etc.) The potential perhaps lies, therefore, in identifying those personally negotiated definitions of self that support the adoption of EEHI and in making appropriate cognitive links through programme design.

5.4.5 Lifestyle, culture and quality of life

Lifestyle and culture, to a large extent, also determine the behaviour and the standards that are familiar to the householder. Proctor offers a retheorised concept of culture. He argues that culture – more properly, the cultural – is best conceived as the pervasive dimension of meaning in social reality (Proctor 1998:237). Rather than viewing culture as a description of what people in a particular group eat, wear etc., it is viewed in a symbolic sense as a process of shared meaning; a means of making sense of reality. Proctor conceives culture as an adjective:

'Whereas the independent reality of *culture* is indeed not only dubious but misleading due to problems associated with reification, the reality and pervasiveness of *cultural* processes – processes of meaning produced and consumed – are undeniable.' (Ibid:239)

Shove (1997 cited in Spaargaren and Van Vliet 2000) put the cultural aspects of domestic consumption at the centre of analyses, highlighting the important influence of

one's expectations with regard to standards of comfort, cleanliness and convenience (see also Shove 1995b; Shove and Warde 1997; Warde, Shove et al. 1998; Shove and Wilhite 1999). The standards to which people adhere and subscribe are dependent on what they are accustomed to. On this basis, domestic consumption practices should be analysed as '...routines that make people meet the standards they think of as "normal" or "minimal required" or "common"' (Ibid). These routines and standards tend to be defined by the values and practices of modern consumerism which is rapidly spreading across the world (see Wilhite and Lutzenhiser 1997:6). In addition, it has been shown that the same practices can have very different symbolic meanings in different cultures (Ger, Wilhite et al. 1995) and certain domestic energy use patterns can have particularly deep cultural roots (Wilhite, Nakagami et al. 1995). These 'cultural energy services', it is suggested, are far less likely to be influenced by information-based energy programmes than other wasteful use patterns with little cultural significance (Ibid).

The findings of the latter two studies provide a strong case for ensuring that the message is framed in such a way that it supports current lifestyle and cultural routines and standards. However, there is clearly potential for both lifestyle and culture to work in conflict with the goals of ERB and domestic energy efficient practices. Palmborg (1995) identifies the 'modern-urban lifestyle' which is driven to consume energy in order to achieve hygiene and convenience. Similarly, Becker et al. (1981) discovered that the less householders were willing to put up with discomfort or inconvenience, the greater their household energy consumption. Palmborg (opcit:28) reflects that the culture of modern-urban life might itself present a barrier to reduced energy consumption. Accordingly, commentators argue that environmental sustainability may demand radical changes in lifestyles and cultural practices (see e.g. Sanne 1995; Oskamp 2000). However, within the energy policy debate, it has been noted that 'lifestyle' has come to symbolise a human right, and hence, something which policy designers have no right to implore people to change (Kempton 1993:221). Indeed, people have been shown to be highly defensive of their adopted lifestyle. A series of focus groups in Switzerland showed that, despite being informed of possible future environmental scenarios and despite apparent environmental concern, people found the prospect of changing their lifestyles of material comfort and high-energy dependence to meet mitigation measures more daunting (Stoll-Kleemann, O'Riordan et al. 2001). To overcome the resulting conflict, individuals created a number of socio-psychological denial mechanisms which heightened the costs of shifting away from

comfortable lifestyles, set blame on the inaction of others, including governments, and emphasised doubts regarding the immediacy of personal action.

Evidence therefore suggests that overcoming the 'habit' of lifestyle presents a considerable challenge. However, it is proposed, once again, that this could be a question of appropriately framing the message. As highlighted, it is not necessarily the case that householders need to sacrifice their quality of life for reduced energy consumption (see Jacobs 1995 for discussion of this concept in the context of energy consumption). Therefore, in asking householders to alter their lifestyles they need not be asked to make sacrifices. Energy efficiency measures in this context offer the *advantage* that, by definition, they offer the same service from reduced energy consumption. It ought, therefore, to be possible to meet expected standards of comfort, cleanliness and convenience in alternative ways which simultaneously reduce energy consumption. The challenge, therefore, lies in framing the message to ensure that householders are not led to believe that a change in lifestyle will result in a lower quality of life.

5.5 Cognitive capacity

5.5.1 Introduction

The term cognitive capacity represents the capability of the householder in processing information. A focus on information-processing is here justified on the grounds that all energy-related behaviour change programmes offer information, in some form, to be used by householders in the decision-making process. The intention is not, therefore, to suggest that only informational campaigns are being considered here; even face-to-face advice and television grant promotions will involve information processing.

Cognitive science recognises that humans are extremely adept at processing information. In many areas of information-processing, such as language understanding and object recognition, 'human competence still vastly exceeds the capacity of high-speed computers...' (Kaplan 2000:497) Evolution explains this skill development in terms of the survival pressures primate humans found when they began to inhabit a savannah environment: in essence, humans depended on their information processing capability for survival (Ibid). The inherent strength of human cognitive capacity has therefore led Kaplan to suggest that this be treated as a resource in the context of ERB, since it can support motivation (Ibid:505). In particular, two traits of human nature relate to human cognitive capacity:

'People are motivated to know, to understand what is going on; they hate being confused or disoriented.

People also are motivated to learn, to discover, to explore; they prefer acquiring information at their own pace and in answer to their own questions.' (Ibid:498)

Despite the apparent strength of cognitive capacity, these traits also suggest limits. While some authors have conceptualised these limits as belonging to human cognitive capacity itself (Anderson and Claxton 1982:163; Kempton and Montgomery 1982; Weber 1999), this author takes the position that it is the environment in which information is presented that plays a critical role in limit definition. In order to permit humans to understand and learn effectively, the environment needs to be compatible with the human inclinations and capabilities identified above (Kaplan and Kaplan 1989:64). Human cognitive capacity is therefore viewed as a positive resource, whose performance can be enhanced through appropriate design of the informational environment. The primary implications of these observations for programme design lie in the realms of the mode of programme delivery and the means of presenting information. These implications are explored in detail below.

5.5.2 Delivery channel

There are a number of views as to exactly what information-processing is, however, the general view put forward by McGuire (1976), parallels the theme of a staged process which emerged in the outline framework:

'Consumers' response to information involves a series of steps, beginning with exposure to information and culminating in some sort of action.' (Craig and McCann 1978:82)

In the context of energy-related behaviour change programmes, Constanzo et al. (1986) propose four key steps which must occur before a programme will result in positive action: information must be perceived; the individual must favourably evaluate the information; the information must be understood; and then remembered. There is a wealth of research to show that the use of appropriate delivery methods and information formats can increase the likelihood that each step is successfully achieved. First the delivery method will be considered.

The type of channel used for delivery has been shown to affect the success of energy information (Rogers and Shoemaker 1971). Delivery methods range from telephone surveys, mass media advertising and written information, to advice surgeries, drop-in centres, and home visits. Different channels tend to be used for different stages of the process, on the basis that some are more appropriate for certain purposes than others. Interviews with UK advice providers yield the following trends (see appendix A): newspaper testimonials are more appropriate in the early stages for explaining the link between environmental degradation and household energy use; the television and leaflets tend to be used for informational campaigns to raise initial awareness of relevant opportunities; letters are primarily used to introduce specific programme opportunities to householders; advice that is delivered either over the telephone or in face-to-face meetings permits response to individual circumstances, although the latter tends to be reserved for low income and/or vulnerable households.

Dennis et al. (1990) identify two primary types of channel: one-way mass media and interactive channels. Some have experienced disappointing results from mass media (De Young 1993; Staats, Wit et al. 1996) and concluded that this channel is rarely effective (Yates and Aronson 1983; Constanzo, Archer et al. 1986), especially where specific conservation activities are not promoted (Ritchie, McDougall et al. 1981). Mass media, such as television commercials, while being good at getting viewers to buy different brands of the same product, are ineffective in getting people to buy new types of products, such as energy efficiency 'innovations' (Aronson 1980, cited in Yates and Aronson 1983). Studies into one-way mass media using only literature have shown either minimal or no change in their target behaviours. However, literature can be made more effective where targeted towards specific audiences (see 5.4.3). Where a standardised one-way approach has been effective, this has tended to be based on the principle that if enough advice is given at least something will be taken-up in action – it therefore tends to yield much waste (Green, Darby et al. 1998).

As identified above (5.4.3), advice is generally more effective if tailored to the specific needs and understanding of the householder (Salvage 1992; Stern 1992; Lutzenhiser 1993; DoE 1996a; Green, Darby et al. 1998). This would suggest the adoption of a two-way interactive channel in order to first discover what those needs and understanding levels are. Information and advice delivered face-to-face constitutes a two-way interactive channel and has been shown to be particularly effective (JRF 1990; Salvage 1992; DoE 1996a). This means of delivery renders information both more vivid - so it is more likely to be perceived (Constanzo, Archer et al. 1986:524) - and also more

memorable (Green, Darby et al. 1998). However, in one instance those who had received only an advice pack, were *more* inclined to adopt energy saving measures than those who received face-to-face advice (Ibid). This is possibly explained by the fact that, having learnt how to operate the heating systems, the latter group would feel that they had dealt with energy issues and might therefore be less inclined to invest in further measures. This type of inadvertent negative effect needs to be considered and accounted for.

The literature reveals that appropriate delivery mechanisms for each situation depend upon the client and the type of advice required as well as the particular process stage. For example, a surgery session or phone call can serve to provide initial information for those who do not want an advisor in their home in the first instance. These methods are adequate for obtaining straight-forward information, such as how one might obtain a grant. On the other hand, there can be no adequate substitute for a home visit when trying to explain heating controls to a client. In particular, it has been argued that the appropriate delivery mechanisms for the fuel rich and the fuel poor are quite different: for the fuel poor, advice should be given in the client's own home and demonstrated on their own equipment; for the fuel rich advice can be effectively delivered over the phone or by correspondence, since they have the money to choose to invest in energy saving measures if necessary (see Green, Darby et al. 1998:56). Many energy initiatives, therefore, use different delivery channels in combination.

Finally, it has been suggested that the effectiveness of information might be increased by a movement away from written sources toward more 'humanised' information provided by video images, community role models and the distribution of energy information through local networks (Ester and Winett 1981-1982). One example of this approach resulted in a 70% increase in client numbers (see the Wester Hailes project in Edinburgh, cited in Green, Darby et al. 1998). The use of role models and local networks is discussed further below (5.5.3).

5.5.3 Information presentation

In order that information is first perceived, it needs to be vivid (Constanzo, Archer et al. 1986:523). It has been shown that people tend to assign disproportionate weight to vivid information and vivid delivery methods have resulted in an increased likelihood of associated action (Borgida & Nisbett 1977, Hamil Wilson et al.1980 cited in Constanzo, Archer et al. 1986). In the case of written information, the format needs to be interesting and eye-catching enough to capture attention (Stern and Aronson 1984,

cited in Anderson and Claxton 1982:163; Constanzo, Archer et al. 1986:523). 'Concrete', or specific examples, can aid in ensuring that information is vivid (Constanzo, Archer et al. 1986:523) and also make information more memorable (Ester and Winett 1981-1982). Evaluating the effectiveness of various information channels, Dennis et al. (1990) conclude that one of the key factors is the specificity of the information.

Highly visible demonstrations are observed to be a successful means to effectively market energy conservation (Coltrane, S. Archer et al. 1986). They offer a means to provide concrete and clear information, as well as offering a message that is personally involving (see Bator and Cialdini 2000:532) – a quality also shown to aid memorability. Social diffusion – i.e. the modelling of positive behaviour by people to whom viewers can relate – offers a particular form of demonstration (Coltrane, S. Archer et al. 1986). In addition to the vividness that modelling brings, the social dimension can add to the weight of persuasion (see also 5.5.2). Modelling of behaviour by friends, family, neighbours and peers has, therefore, been shown to be very effective in promoting energy saving behaviour (Aronson and O'Leary 1983; Yates and Aronson 1983).

5.5.4 Timing and frequency

Research has found that, in general, a consequent information strategy (i.e. feedback about recent personal energy-related behaviour) is considerably more effective in changing behaviour than an antecedent information strategy (information about encouraged forthcoming energy-related behaviour) (Ester and Winett 1981-1982; Stern 1992; Lutzenhiser 1993; Green, Darby et al. 1998). Various feedback techniques have, in effect, tried to make energy use more visible in an attempt to reduce consumption. Studies such as those by Arvola et al.(1994, cited in Green, Darby et al. 1998), Wilhite (1999), Wilhite and Ling (1992; 1995), Haakana, Sillanpaa et al.(1997) and Darby (1999) all show the effectiveness of feedback in bringing down consumption, whether by households reading their own meter, or by utilities providing consumption information. However, others have concluded that evidence as to the effectiveness of energy feedback in the UK is inconclusive (Green, Darby et al. 1998). Reviews of the large number of feedback studies which have been done are found in Seligman et al and Farhar & Fitzpatrick (cited in Lutzenhiser 1993:254). The reviews discuss the qualities of relatively effective feedback such as timeliness and interpretability.

According to Ester (1985), one may only attribute educational significance to highly frequent feedback (weekly or daily). However, in certain cases more frequent feedback

might sometimes be inappropriate (ibid). The most important outcome of Ester's own study was that biweekly or monthly feedback was no more effective than providing householders with energy conservation information or prompting them to monitor their household energy consumption. The drawback of the consequent approach has been that a withdrawal of feedback often results in a return of energy use to previous levels (cf incentives): some studies have found that control groups who make significant changes to their consumption are prompted only by the knowledge that their behaviour is being monitored (see Dwyer, Leeming et al. 1993; Lutzenhiser 1993 for reviews of relevant studies). However, it has been identified that the utilities could play a key conservation role in the UK by, among other things, giving customers clearer information about usage trends and by including warnings and advice about conservation on bills (Hedges 1991; Mudyn and Ryzak 1997). This approach has had positive results in Norway where bills now include feedback on consumption history, consumption compared to other households and consumption by end use (Wilhite 1999). Contrary to Ester's finding, bi-monthly feedback via bills in Norway demonstrated a 10% decrease in consumption that was due to behaviour changes alone (Green, Darby et al. 1998). Ester suggests there is a need for the development of instruments for active self-monitoring of energy usage by residents to overcome the obvious problems accompanying highly frequent monitoring by independent bodies (op cit).

Various initiatives have shown that if too much information is provided in too short a space of time, then clients will remember little and at worst will tend to feel confused and alienated, thus acting on none (Green, Darby et al. 1998, see also 5.3.5). Follow-up advice sessions therefore become important where there is a need to cover a number of issues. Where only one issue becomes the focus of advice, the literature shows that it is still important to follow-up the initial session in some way; whether to reinforce the message, prompt clients into action or build on what has already been achieved. Programmes which involve a single advice visit have shown little in the way of results, whereas those involving multiple visits have resulted in significant savings (Green, Darby et al. 1998:59). The literature shows that the provision of good quality back-up material is important when there is only one opportunity for client/advisor contact. The back-up material itself is also most effective when given a clear identity and presented in a way which attracts attention and is memorable (Salvage 1992; Lutzenhiser 1993; Green, Darby et al. 1998).

Evidence from a number of studies suggests that timing advice to coincide with a time of change can increase the likelihood of effectiveness (DoE 1996b; Green, Darby et al. 1998; JRF 1998; Darby 1999). This kind of opportunistic advice may be offered when the householder moves home, when refurbishment is being undertaken, or when energy-related devices are being installed/replaced. These options represent a 'direct approach' as introduced in the outline framework; its effectiveness resting on what Dennis et al. (1990:1113) have called the proximity of the presented information to the target behaviour. As well as offering the opportunity to inform an active decision-making process, this approach enables energy efficient habits to be encouraged before bad habits become established (e.g. advice projects in Stirling and on the Medler Farm Estate cited in Green, Darby et al. 1998:52).

5.5.5 Credibility

In order to ensure that the programme message is evaluated positively there is a need to establish the information as trustworthy (Craig and McCann 1978; McGuire 1985; Coltrane, S. Archer et al. 1986; Constanzo, Archer et al. 1986; Dennis 1990; Hedges 1991; Stern 1992). The credibility of the information source has been shown to influence the effectiveness of a given message (see Hovland Janis & Kelly 1953, McGuire 1969, 1985, Aronson Turner & Carlsmith 1963, all cited in Constanzo, Archer et al. 1986:524; Bator and Cialdini 2000:533), affecting, for example, the number of requests for information and even energy consumption (Craig and McCann 1978). Research shows that where advice is identified as originating from a 'highly credible source', this results in a greater attitude change than the same measure from a source of lower credibility (Salvage 1992:78; Stern 1992:1228).

As outlined at 5.3.8, the UK public has been identified as being extremely sceptical about official institutions in general and hence sceptical of information from both local and central government and the mass media (MacNaughton 1997). In one particular study there was a general difficulty in deciding which information source was considered sufficiently trustworthy, some groups identifying environmental organisations, others suggesting independent scientists and international organisations such as the United Nations (Ibid). Information was more likely to be considered credible if it supported direct experience, however, many people felt unable to make judgements about the validity of expert claims regarding the environment based on their own and local knowledge (Harrison 1996). The confused messages that people receive about the environment via experts and the mass media tend to encourage cynicism and doubt among the lay public (Ibid). Where people have to rely on 'expert'

knowledge alone, there is a sense of scepticism among most groups: lower socio-economic groups are least likely to find this information credible; middle class groups feel they have to rely on this information, but believe it to be biased.

Trustworthiness of the advisor is also crucial if clients are to act on the advice given. Where organisations gain most of their clients by recommendation, evidence suggests that advisors are trusted to give effective advice (Green, Darby et al. 1998). The gender and age of advisors does not appear to play an important role in rendering advice effective. Diffusion of information through existing social networks has been found to be particularly effective in attaining credibility, especially where users are invited to participate in the programme operation (Stern 1992; DoE 1996a; Green, Darby et al. 1998).

Finally, the method used to deliver the message is also identified as a factor relevant to credibility. Incidental information is often considered to be more credible than a direct message because the communicator is perceived to have little self-interest (Dennis 1990). It is therefore suggested that energy related information is more likely to be perceived as trustworthy if disseminated by indirect means.

5.6 Discussion

| EVERYDAY HOUSEHOLDER TRAIT | PRIMARY IMPLICATIONS FOR WHICH AREA OF PROGRAMME DESIGN? | SPECIFIC RECOMMENDATIONS |
|----------------------------|--|--|
| Self Interest | Expert & householder roles in process Message content | Personal gain Procedures Exploration Efficacy Participation Frugality Luxury |
| Energy Knowledge | Framing the message | Visibility Quality of life Familiarity Personalisation/Tailoring Self-Identity |
| Cognitive Capacity | Message delivery and presentation methods | Vividness Specificity Humanisation Demonstration Opportunism Follow-up Credibility |

Table 5-1: Summary of the implications of the Everyday Householder-centred approach for programme design

Table 5-1 shows the implications of each identified everyday householder trait for the design an information programme to engage householders in EEHI. In building an understanding of these traits in the context of ERB, a number of specific recommendations for programme design have emerged, which centre on the themes outlined. These recommendations are discussed below.

5.6.1 Self-interest

The two conceptions of self-interest that have been explored imply a range of potential foci for the content of the programme message. First, the selfish notion of self-interest

implies that it is possible to motivate EEHI by highlighting the consequent personal gain outcomes - whether they be a natural consequence of the activity or an added incentive. In both cases, the householder is expected to be motivated by extrinsic satisfaction. Since personal gain, rather than the environment, is the focus of the message the issue of environmental responsibility is avoided. The drawback of this approach is that once the source of extrinsic satisfaction is removed, EEHI activity is unlikely to continue.

The second notion of self-interest focuses on the self-generated and more durable intrinsic satisfaction as a source of motivation. Taking this approach, it is conceptually possible to appeal to both altruism and also the innate tendency to protect and further oneself. The householder is therefore likely to accept personal responsibility for alleviating the environmental problem because of the sense of satisfaction derived from taking part in the activity itself. Four categories of this satisfaction have been identified. First, competence. This category suggests that everyday householders will engage in situations which offer the opportunity to exhibit or further competence. In order to facilitate this process, there is a need to provide appropriate procedural information and an environment which supports exploration without overloading the householder with information. Communicating the effects of the EEHI to householders might increase a sense of personal efficacy and thus encourage action.

Second, participation. The everyday householder derives satisfaction from a sense of being needed and being able to make a difference. Offering opportunities for the householder to play an active role in defining a solution will result in a positive sense of choice and control, likely to make the programme more effective. Active participation also permits exploration of 'solutions' attractive to the householder in addition to those considered technically optimal, thus capitalising on the foot-in-the-door technique. Third, frugality. Some people are driven to achieve competence in the activity of waste avoidance. Therefore, it would be profitable to highlight the relevant opportunity that EEHI offers when designing the programme message. In a particular, potential savings as avoided loss when constructing this message. Fourth, luxury. Luxury appeals to the householder on two levels: the attraction of convenience that it offers as part of modern society; and the attraction of new and novel products. Energy efficiency products should therefore be framed, where possible, as up-to-date novel products which offer a more convenient way of life.

It is clear that there are multiple motivations for ERB and hence no single factor is likely to be effective in motivating energy efficient home improvement. People have multiple needs and want many different things (Murray 1938, cited in Kaplan and Kaplan 1989: 64)– and not necessarily the maximum amount of any one of them (Kaplan and Kaplan 1989:63). As one author puts it, people desire both sleep and sunshine, and would be unwilling to trade one for the other (Ibid). There can be no optimal solution in this setting. By acknowledging a plurality of needs and desires in the programme message, each individual will be able to assimilate a version of energy efficient home improvement that is instead perceived to be reasonable and hence acceptable behaviour.

5.6.2 Energy knowledge

The everyday householder's energy knowledge clearly differs from that of the expert programme provider. Rather than relying on abstract technical knowledge and terminology, the householder knows energy through the experiences, the quality of life and the self-identity that it supports. The everyday meaning of domestic energy therefore lies within, and is defined by, these realms. This revelation has a number of implications for the way in which the message should be framed by the expert in order to ensure that the message is perceived to be relevant by the everyday householder.

First there is a need to make energy and energy efficiency more visible. The invisibility and intangibility of these concepts make them difficult for householders to relate to everyday activity. Framing the message to talk of energy in terms of the services that it offers allows the householder to see how EEHI might have a positive impact on everyday experience. This idea links to the themes of 'foremost in the mind' and 'add-on issue' that emerged in the outline framework.

Second, in order to ensure that the householder perceives the relevance of the message, it is necessary to frame the message using familiar language and concepts drawn from the everyday domestic discourse surrounding energy use. Third, relevance can be achieved by personalising and tailoring the message, focussing on individual needs, desires, attitudes and worldview.

Fourth, the energy efficiency behaviour and the installed measure itself should, where possible, offer an opportunity to express a positive self-identity. These type of opportunities should therefore be communicated via the message. The particular self-identity that is perceived to be positive will depend in part on the individual. However,

those measures that are visible will tend to be perceived more favourably, along with those that are perceived to be a 'luxury' product. Where a measure is not visible to visitors, the luxury aspect of an energy efficiency product – i.e. the convenience and novelty it offers – should be communicated. The potential to express personally negotiated identities, such as 'a green person', or 'a caring person' can be explored further through dialogue with individuals.

Fifth, there is a perceived need to maintain quality of life, represented by expected standards of comfort, cleanliness and convenience. The message should therefore be framed in such a way that the everyday householder is aware that energy efficiency will not in any way erode these standards. In certain cases, standards, and hence quality of life, may even be improved through EEHI. Clearly this should be communicated where appropriate.

If each of these areas is addressed in framing the message, then the potential disparity between the expert's mode of conceiving the message and the householder's mode of receiving this message is likely to be dissolved. The householder, finding meaning in the message, will perceive its relevance and hence be able to consider the consequences of engaging in energy efficient home improvement in the context of everyday life.

5.6.3 Cognitive capacity

The everyday householder's cognitive capacity is here conceptualised as a resource. The householder's information processing performance can be aided through the appropriate design of the informational environment, i.e. by adopting delivery and presentation methods which support everyday inclinations and capabilities. Research findings suggest the following approaches.

A vivid message is more likely to be perceived and remembered by the householder – two key stages in turning information into action. Eye-catching presentation techniques, demonstration and humanised media forms all contribute to vividness. Demonstration methods offer a form of proof, identified in the outline framework to be of importance to householders. Friends, family, neighbours and peers are a particularly valuable source of demonstration, often modelling the successful use of new products or behaviours prior to their adoption by the householder. This process of social diffusion, via existing social networks, is also strong on two other levels: first it offers a personal, or

humanised delivery mechanism; and second the message itself is credible due to the 'proof' that is offered and the trustworthiness of the source.

Credibility and humanisation overlap considerably, since a great deal of the value of humanising the message lies in the credibility that this approach offers. Other humanised approaches include giving the message a strong local identity and having the message delivered by a known and trusted individual. It is extremely important to ensure that the message source is perceived to be trustworthy. People tend to believe messages that they can validate based on their own and local knowledge. This infers that any opportunity to make links between the EEHI being promoted and everyday experience will be valued. Mixed messages should be avoided wherever possible in order to reinforce credibility. Feedback (about energy consumption and EEHI) offers another means to reinforce the credibility of the message, since it is based on the householder's own activity.

Programmes that deliver vague, broad messages about the value of ERB have shown little promise. Specific messages, for example detailing possible EEHI that might be undertaken, are far more effective, in part because they are more likely to be understood (due to their clarity) and then remembered. Finally the timing and frequency of advice can also increase its effectiveness. If offered at times of opportunity for positive action, it is clearly more likely to be acted upon. In the context of EEHI this suggests offering advice when an energy-related device is being replaced or fitted for the first time or when the home is being refurbished - for example, when the homeowner first moves into the home. While one instance of information or advice provision might prove effective, it is usually better to follow-up this with another session (or provide back-up material) whether simply to prompt or to provide with further information.

5.7 Summary: the conceptual framework

The concepts and categories that emerged from initial interviews with programme providers (Chapter 4) suggested that the difficulty in 'getting the message across' might lie in the fact that the provider of the message takes an expert perspective while the householder takes an everyday perspective. While the message that was being delivered was based on expert conceptualisations, the receiver of the message, with only everyday references, had little (or no) access to this message. The expert therefore tended to conceptualise the householders themselves as a barrier to 'getting

the message across', i.e. a barrier to implementation of the optimal (often technical) solution.

The resulting outline conceptual framework (4-2) proposed a model in which, rather than being a barrier, the everyday householder's inclinations and capabilities positively informed expert conceptualisations. In this way, the expert and the everyday perspectives might be synthesised, permitting the delivery of a message that is both driven by 'the problem' and also accessible to the everyday householder. This approach sees the everyday householder, not as a barrier, but as *part of* the 'solution'.

Therefore, in exploring the literature, this chapter has focused on developing a conceptual understanding of the key traits (the inclinations and capabilities) of the everyday householder in the context of environmentally responsible behaviour. These key traits have yielded a number of themes with implications for the development of an effective information/advice programme to engage owner-occupiers in energy efficient home improvement. In the light of this focus on the everyday householder, the developed framework is renamed. Figure 5-1 summarises the key traits of the everyday householder and the implications for programme design in the areas of: the provider and householder roles in the process of getting the message across; the message content; the framing of the message; the message delivery methods; and message presentation methods. For clarity, this diagram shows direct connections between the householder and the programme, however, it should be noted that the outlined implications might only inform the programme development via policy-makers (the provider) who, in effect, synthesise the householder perspective with that of the expert. This diagram should therefore be read in conjunction with the conceptual framework represented in figure 5-2.

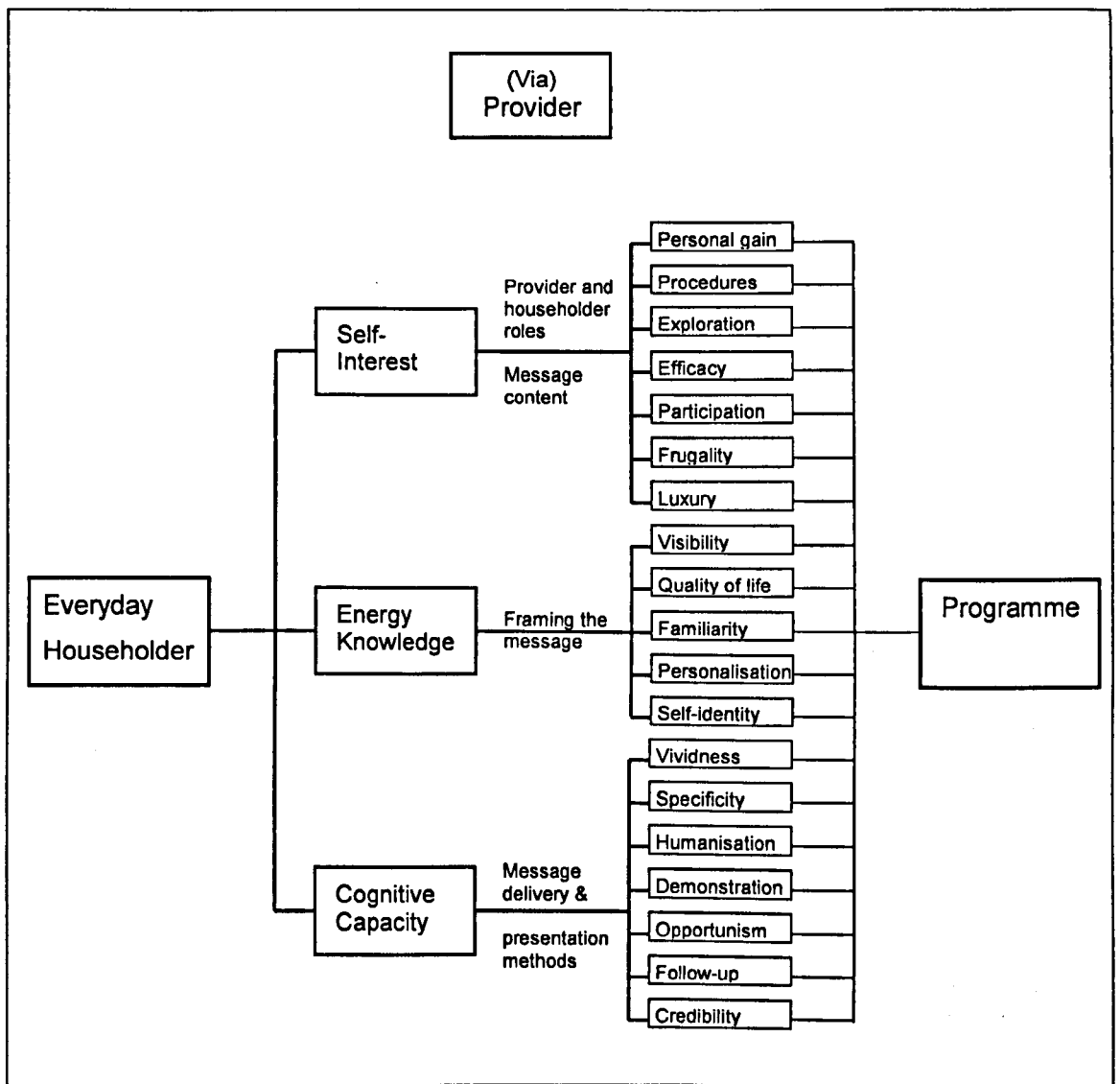


Figure 5-1: Diagram to summarise the implications of the everyday householder-centred approach to programme design

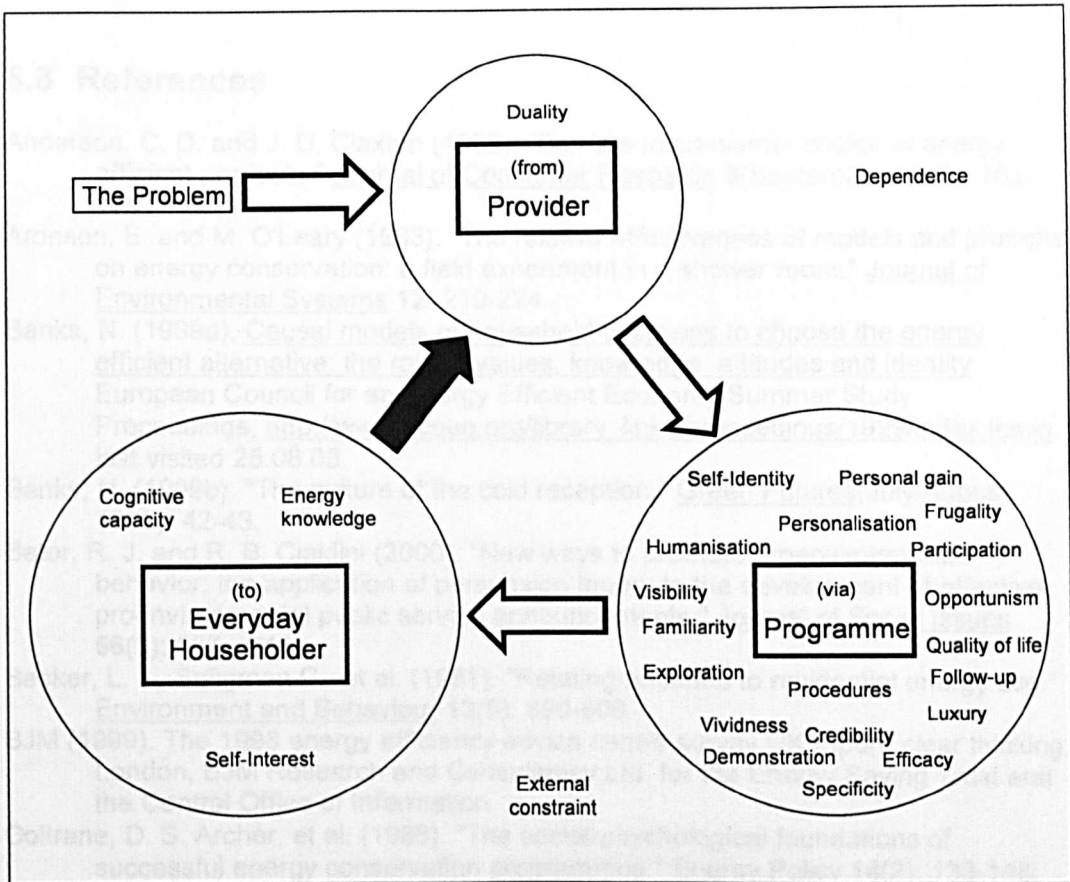


Figure 5-2: The everyday householder-centred approach to programme design: a conceptual framework for the development of an effective programme to engage owner-occupiers in energy efficient home improvement.

The validity of this conceptual framework will be explored theoretically and empirically in the remainder of this thesis through one particular programme: the home energy report.

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6. The home energy report

6.1 Chapter outline

This chapter focuses on one specific government programme with great potential to improve energy efficiency in the owner-occupied domestic stock in England: the proposed seller's information pack home energy report. Relevant preliminary findings from a pilot study of the seller's pack are described. The potential scope and future development of the initiative are outlined. The chapter concludes by highlighting the opportunity for further empirical research into the householders' response to the report and its effectiveness, which might inform both the development of the conceptual framework and also the development of the programme itself.

6.2 Introduction

Government programmes to improve the energy efficiency of the housing stock tend to be driven primarily either by the need to reduce CO₂ emissions or the need to improve living conditions for the health and well-being of the occupants (see appendix B). While improved domestic energy efficiency can potentially contribute to both areas, these goals are not necessarily met simultaneously¹. The relevant UK initiatives tend, therefore, to be driven primarily by one of these aims only, perhaps regarding consequent benefits in the other area as a bonus. The empirical research for this thesis centres on one particular programme, as outlined in the UK Climate Change Programme (DETR 2000c:107): the proposed seller's pack home energy report. This initiative is driven primarily by the need to reduce CO₂ emissions.

The notion of the seller's pack was introduced to the researcher during the course of the initial interviews (see appendix A, 13.3.7). If introduced, the pack would form an obligatory part of the home buying and selling process and would present an opportunity to deliver domestic energy information and advice specifically intended for homeowners. In the context of the research question, this was clearly a significant programme, with great potential to improve the energy efficiency of the owner-occupied housing stock; thus it warranted further investigation. The author narrowed the scope of the final two phase 1 interviews in order to discover more about the presented opportunity and to begin to explore the potential effectiveness of such a programme.

¹ In particular, the alleviation of fuel poverty is unlikely to result in significant reductions in CO₂ emissions (and might even result in an increase) due to the 'take-back' phenomenon where increased energy efficiency is 'taken' in increased comfort.

The description below draws on these two interviews, conducted with staff at the Department of Transport, Environment and the Regions (DETR) in 2000, and also relevant publications that the author was directed to during the interviews.

6.3 Description

6.3.1 Background

The first part of the interviews focused on clarifying details about the proposed home energy report (see figures 6-1 & 6-2), its relationship to the to seller's pack and its status.

In October 1999, the UK Government proposed a package of measures intended to improve the efficiency of the home buying and selling process in England and Wales, from the perspective of the consumer (DETR 2000f). Perhaps the most significant component in this package was the proposed introduction of a compulsory home seller's information pack which would be produced for every home on the open market (DETR 2000g). The seller's pack aims to speed up the home-buying process and reduce incidence of 'gazumping' by bringing forward to the very start of the transaction process, essential information about the legal status and condition of each property. The pack would include copies of: title documents; answers to standard pre-contract enquiries; replies to standard search enquiries; planning and building regulations consents; warranties and guarantees for any work carried out; a draft sale contract; a surveyor's report on the condition of the property and its energy efficiency; and for leasehold properties, information about lease, services charges, insurance and the management arrangements.

Legislation to support the above proposals was introduced to the House of Commons on 12th December 2000 in the form of The Homes Bill 2001. The Bill received its second reading, in the House of Lords, on 28th March 2000, but did not pass into law due to a lack of Parliamentary time before the General Election. At the time of these interviews the Bill had not been announced in the Queen's speech. However, the Government's commitment to the seller's pack and the energy efficiency element of this pack remained and in the mean time, DETR was continuing to consult with consumer representatives and relevant professional bodies in order to further develop the pack contents and ensure that the market place would be ready for its implementation.

Of concern here is the opportunity presented by the seller's pack to offer energy advice with every home sold on the open market in the UK. The home energy report (HER) included in the pack would detail the current SAP² rating of the dwelling and propose the adoption of specific energy efficiency measures to increase this rating, potentially reducing fuel bills and CO₂ emissions. The pilot report format available at the time focused on communicating fuel costs and resulting financial savings as a means to motivate, with associated carbon savings presented as a secondary piece of information. The ultimate aim of the HER is to abate carbon and reduce effects of global warming. One interviewee described this as the 'headline benefit' as far as the Government is concerned. In addition he cited the benefit of creating more comfortable homes which are easier and cheaper to heat. The energy rating within the report would also give people a means for comparing homes in terms of energy efficiency and provide a benchmark figure with which to work. According to DETR the inclusion of such a report:

'...sends a powerful message to homeowners, the construction industry and appliance suppliers alike. It empowers consumers to factor in energy efficiency as part of their decision to buy a particular property – and to understand better how they can have control over the energy performance of their home (by consumption patterns and home improvements). Construction and appliance suppliers will have to respond to the needs of better-informed consumers.'

(DETR 2000f:section 5)

² Standard Assessment Procedure – this national energy efficiency rating method gives the dwelling a rating between 0 (minimum energy efficiency) and 100. SAP 60 is generally considered the minimum acceptable rating.

How to save money on your fuel bills, improve the comfort of your home and help the environment



Certificate No. 141797

Home Energy Report

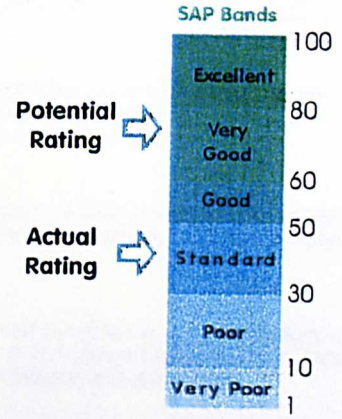
For 1 Any Street, Bristol.

Certificate/Ref No: 38702

Date of Issue: 03 August 2000

The SAP rating is on a scale of 1-100 and is similar to the miles per gallon for cars- the higher the rating the more energy efficient the home and the lower the fuel bills and Co2 emissions. Lowering Co₂ (Carbon dioxide) emissions helps to reduce global warming.

The potential property figures are calculated assuming all the Improvement Options have been carried out. The installation costs, except where indicated, are based on a contractor carrying out the work but a cheaper alternative may be DIY where appropriate.



| | This property at present | Potential for this property |
|---|--------------------------|-----------------------------|
| SAP Rating | 40 | 75 |
| Estimated annual Heating Cost | £527 | £257 |
| Estimated annual CO ₂ Emissions (tonnes) | 6.3 | 2.8 |

Good Energy Efficiency measures already installed

Hot water cylinder insulation
Heating controls

| Improvement Options | Annual Savings | Estimated Cost | Payback Within (Years) |
|--|----------------|----------------|------------------------|
| Draughtproof all doors and windows | £10 | £184 | 18.4 |
| Roof insulation increase to 200mm | £36 | £180 | 5.1 |
| Solid Wall insulation add 50mm | £142 | £3946 | 27.0 |
| Replace boiler with fully controlled gas condensing boiler for heating and hot water | £64 | £1482 | 23.0 |
| Secondary glaze the single glazed windows | £18 | £1783 | 100 |

The table above is calculated cumulatively. Consequently the improvements in the bottom half of the table may result in greater individual savings if done without the other improvements.

Excluded from the above figures further possible improvement options are:

Low energy light bulbs- cost between £5 and £15 each but each may save up to £10 a year

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Figure 6-1: DETR pilot home energy report page 1

UNDERSTANDING YOUR HOME ENERGY RATING REPORT

The SAP

The SAP awards an energy efficiency score to the Home on a scale of 1-100 — the higher the number, the better the standard. The SAP is based upon the annual cost of space and water heating. It assumes a standard number of inhabitants based upon dwelling size and does not include the cost of lighting and cooking. This Report has been independently processed by Elmhurst Energy Systems using calculations set by the Government's Standard Assessment Procedure.

| | |
|---------------|-----------|
| 81-100 points | Excellent |
| 61-80 points | Very Good |
| 51-60 points | Good |
| 31-50 points | Standard |
| 11-30 points | Poor |
| 1-10 points | Very Poor |

How does the fuel affect the SAP?

The combined price and efficiency of fuels is important as the more expensive and inefficient the fuel the poorer the SAP. From worst to best the order is electricity, LPG, house coal, mains gas and oil. It is sometimes possible to improve the SAP and the fuel bill by using cheaper fuel but without improving the CO₂, as the CO₂ is related to the amount of fuel used.

The estimated annual Heating costs

The SAP assumes that the property is heated to between 18 and 21 degrees centigrade for 9 hours per day during the week and 16 hours a day at the weekend. Consequently, the annual heating costs and potential savings are only estimated and may not necessarily reflect the present living style.

Installation cost

The installation costs used are only approximate and may vary up or down when they are subjected to actual quotations. Each improvement has a built-in minimum charge so there may be further savings if two or more improvements are carried out at the same time. Where possible only use contractors that are backed up by national or industry-wide guarantees.

Insulation and heating improvements

New homes are built to high standards of energy efficiency. Unfortunately, most homes are not energy efficient, being built before the present standards of insulation were required and when heating systems and controls were less sophisticated. By improving your home insulation and heating, you can achieve all the warmth when and where you want it. Good heating and insulation often means less condensation and may also increase the market value of your home.

Payback

In the table, the payback Years is the period over which the cost of the improvement is expected to be recovered through savings on fuel bills. Expensive items with longer payback periods may only prove to be cost-effective if they are attended to when replacement is required.

CO₂ tonnes — carbon dioxide

The Report shows you how to save money on your heating costs, BUT you are not just helping yourself, you are also helping the environment. Most of our energy comes from burning fossil fuels; coal, oil and gas electricity, either directly or from generating. All this burning releases CO₂ (carbon dioxide) into the atmosphere. Carbon dioxide is the main contributor to global warming, the greenhouse effect, which is threatening the world in which we live. The UK is committed to reducing carbon dioxide to 20% below the 1990 level by the year 2010. Generally, for £100.00 of fuel saved annually there is a reduction of 12 tonnes of CO₂.

Further improvements not included in the Report

Low energy lighting. Low energy light bulbs are a very worthwhile investment. Energy saving lightbulbs cost between £5.00 and £15.00 each, BUT they last 8 times longer than ordinary light bulbs and this benefit added to the reduction in electricity means each one will save you about £10.00 per year.

Solar heating

The UK has over 40,000 solar water heating systems. Providing approximately 60% of domestic hot water needs, typical installation costs vary from about £800 for a Do It Yourself system, to £3,000-£4,000 for a commercial system. For an average 3-bed semi-detached house whose water heating bill for an on-peak immersion is about £300 per annum, a commercial system would have a payback period between 15 and 20 years.

Conditions

Elmhurst is independent of any fuel suppliers or contractors, and therefore does not recommend any particular supplier or contractor for implementing improvements set out in this Report. It is impractical to investigate every part of the structure of an existing property, but most follow a pattern in methods of construction and layout. This enables certain assumptions to be made, but there are individually styled dwellings where the assumptions and, accordingly, the SAP may not be entirely accurate. This Report may be reliant on information provided by the occupant or others, and therefore Elmhurst cannot be held responsible for inaccuracies in the information used to produce this Report.

Warning: The calculations assume that the existing insulation and heating system are in good working order (even if they are not) and, likewise, although the improvements listed assume suitability this is not implied and appropriate advice should be sought before proceeding, particularly if the property is a Listed Building or in a Conservation Area.

Figure 6-2: DETR pilot home energy report page 2

This type of report had been shown to be effective in Europe, in particular in Denmark. Here a quite 'Draconian' approach had been taken, with every house being surveyed and checked periodically. This approach is expensive, and the interviewee believed that this resulted in money being spent on the report when it could be spent directly on increasing the energy efficiency of the home. This 'strict' model was unlikely to be followed in England and Wales. In order to avoid great expense being incurred through report production, the intention was to 'bolt on' the energy report to the home condition report. The homebuyer's survey required much of the same information as the energy report, thus only a very small amount of extra information would be required, which it was estimated would take only 5-10 minutes to collect. The cost of the energy report would therefore be likely to be the same or only a small sum more than the homebuyer survey:

'It's got to be said that going and doing an energy report on its own is a great joke, because it's probably cost you more to send the surveyor to the property than it will ever save, so that's a non-starter, but if its part of another survey, then it's really cost effective.' (DETR 3)

A previous Private Members Bill - the Energy Efficiency Bill – aimed to require mortgage lenders to provide an energy report and an energy rating for all mortgage transitions. Though the Bill was supported in principle, with cross party support, it was twice blocked in Parliamentary sessions. However, mortgage lenders were encouraged to take it on-board on a voluntary basis and a number of pilot schemes resulted, each of which was supported by a Government-authorized SAP rating company. Three of the four possible companies were involved: MVM Starpoint, Elmhurst Energy Systems and National Energy Services.

6.3.2 Implementation and householder response

DETR tested the concept and content of a seller's information pack in a pilot study carried out in Bristol in 1999/2000. The pilot study involved 250 transactions made in the Bristol area. Bristol was chosen for its variety in market activity, having hot spots as well as areas of low activity and a 'whole range of property price bands'. The pack was being piloted at the time of the interview and preliminary feedback had been gathered. The second section of the interviews, therefore, focused on the performance of the energy report and the householder reaction.

The pilot research did not focus in great depth on the energy report itself, but anecdotal feedback had proved interesting. The format of the report had been changed at an earlier stage of the pilot when it was found that householders found it difficult to understand and surveyors difficult to produce. There was a sense among householders that the energy report felt 'out of context' among the other documents. Predictably some sellers disliked the report as they interpreted the advice as highlighting faults that they would prefer potential buyers not to see. Buyers apparently also misunderstood the purpose of this information:

'...there were cases where, because we were providing generic information about ways of improving the property and its energy efficiency and giving some idea of the cost and pay-back time-scale, buyers were thinking well, if we did all this it would come to £5000 or £2000 or whatever, therefore we'll ask them to knock £2000 off the purchase price.' (DETR4)

The surveyors pointed out the inconsistency between this approach and that taken in the home condition survey: in the latter, problems are similarly identified, but they 'wouldn't dream of trying to cost them' because there is potential for such great variation (DETR4). One interviewee spoke of having to watch this conflict 'very closely'. There were also signs that the SAP rating out of 100 was confusing for householders who were likely to ask what it meant. It was suggested that a simpler energy labelling system could be employed, such as that used for appliances.

There was concern that the energy report could 'get lost' in all the information within the sellers pack. It was suggested that it might be necessary to introduce some follow-up methods with the aim of bringing the information back to people's attention, for example through the network of Local Energy Advice Centres or through Local Authorities as part of HECA. However, one interviewee pointed out the advantage of providing the advice at the time of moving:

'I think the big advantage of doing it as part of the home buying and selling process in the seller's pack is that we know that quite often when people move house they very quickly get on with improving the property...new kitchen, bathroom, decorating and that sort of thing...and quite often it is far more efficient to do these things at the same time.' (DETR3)

These reports also offer the advantage that they will reach everyone who is buying or selling a home, no matter what their current level of energy efficiency awareness. Unlike the core practice of local energy advice centres, this initiative would proactively provide information rather than relying on the householders to seek information. This should mean that energy efficiency advice reaches some people who might never otherwise have received it.

One of the interviewees highlighted the advantages of the seller's pack energy report over the EST self-completion home energy form:

'...if there is a survey going ahead on the property then more information is being collected and because you've got more information the recommendations in the report will be more accurate and they can also be better tailored to the specific circumstances of the household.' (DETR3)

In summary, pilot results showed that the energy report was generally well received by homeowners, but that they did not generally understand the report as well as the general home condition report. These findings, along with other Government policy developments, resulted in the identification of several key issues for consideration in finalising the format of the energy report:

- (i) DETR's preference that the energy report should be included as an integral part of the home report and not a separate document;
- (ii) the relative merits of presenting the energy rating information as a SAP rating (which is a 1-100 scale) as opposed to an A-G rating akin to domestic appliances;
- (iii) the extent to which the energy report form should enable surveyors to tailor information to particular types of property³... ;
- (iv) the desirability and practicability of including the costs and savings associated with particular improvements; and
- (v) the overall layout and user-friendliness of the report form – both for those completing it, and consumers expected to understand it.'

(DETR 2000f:section 9)

It was intended that the Condition Report Working Group would play a key role in developing an integrated home energy and condition report. The final version of the

³ For example, the pilot form gave no opportunity for a surveyor to remove the energy rating company's absolute recommendation to fit a condensing boiler despite the existing boiler being very new (DETR, 2000f)

energy report would be needed for further piloting of a proposed final seller's pack which should be scheduled to fit with the legislative timescale and development of a home surveyor certification scheme. It was also intended that the feedback from the pilot should be further studied in so far as it relates to the energy report, in order to help address the key issues above.

6.3.3 The future

Should the Government succeed in legislating for a seller's pack, there would be two possible approaches: one would prescribe the information and the format for presentation, the other would only prescribe the information. The latter would make it difficult for the consumer to compare packs and so it would be preferable to legislate for a standard format. In order to overcome the potential problem of inflexibility associated with prescribing a statutory instrumental format for the survey, a number of bodies would be approved who certificate individual surveyors to carry out home condition reports. This would retain flexibility, while allowing a common format to be retained across the board. It is expected to take approximately two years to introduce the new regime once a legislative 'slot' has arisen. Since there were only four government-approved energy-rating companies, consultation on the final design would be expected to be relatively straight-forward.

The HER was not expected to make a great contribution (perhaps less than 0.1 mtc in the first year) to the Government's 20% reduction target for domestic CO₂ emissions. However, the report would reach all homes sold on the open market and it was expected to be effective in motivating action.

One of the interviewees mentioned the idea of linking the report to finance schemes:

'...we want to look at situations where the homebuyer say, read the report, thought it was wonderful, really would like to all these things, but, first time buyer, finances are tight and so-on and so-forth, so we want to take it a step further and in consultation with the lending industry, find out how lenders feel about advancing loans to enable these works to be carried out.' (DETR4)

There might also be opportunity to link the report to financial incentives through EST grants and the Standards of Performance (SOP), especially the forthcoming SOP4 (more recently renamed the Energy Efficiency Commitment). These ideas would require further discussion and collaboration.

6.4 Evaluation: a missed opportunity?

Since it is intended that the seller's pack home energy report be introduced nationwide via legislation, the programme has the potential to become an extremely important part of UK private sector domestic energy efficiency policy. Despite the small contributions that the programme is expected to make to the national CO₂ reduction targets in the first year, in the long term, the programme could have a significant impact on the energy efficiency of the owner-occupied stock, reaching every homeowner who buys a property on the open market. Anecdotal evidence suggested that the report had a number of strengths including: its focus on homeowners, in particular owner-occupiers; its proactive opportunistic approach; the provision of specific recommendations; the relative accuracy of information; and the opportunity to tailor advice. However, at the time of this research, there had been no formal evaluation of the report itself and little was known about the householder response. Preliminary evidence suggested that a number of weaknesses existed in the design of the report and that these might reduce effectiveness. For example, confusion over SAP ratings and a sense of the energy report being out of context.

Given the potential significance of the initiative in the context of both policy and also the thesis research question, the author felt it was important to take the opportunity to evaluate the report during this development stage to aid the effectiveness of the final programme design. Such an evaluation would also present an opportunity to invite the participation of the everyday householder in the development of the initiative and in so doing, explore the validity of the conceptual framework as a reflection of an everyday householder-centred approach to programme design.

N.B. Since the core of this thesis was completed the proposals for reforming the home buying and selling process have instead been included in the draft Housing Bill (2003). Alongside this draft Bill, published in March 2003, ODPM has published a consultation document outlining the proposed content of the seller's home information pack (ODPM 2003b). As part of this document an alternative energy report format has been proposed, which is integrated into the home condition report (Ibid:134). Feedback on this 'latest working draft' (Ibid:30) is invited by 30th June 2003. The results of this thesis have therefore proved timely and will ultimately inform the development of the seller's pack HER, potentially aiding the effectiveness of the final programme design. (Final recommendations are made in chapter 12)

6.5 Summary

The seller's pack home energy report, as an obligatory part of the home buying and selling process, has the potential to become a highly influential part of government policy in the context of a long term, sustainable approach to private sector domestic energy efficiency. The report had been piloted as part of the seller's pack, but there had been no formal research into the response of the householder and the effectiveness of the report. Anecdotal evidence suggested that the programme design had a number of strengths, but also some weaknesses. In order to develop the report for improved effectiveness, it was clear that further research was required, focusing on the HER in use.

The validity of the proposed conceptual framework -'the everyday householder-centred approach to programme design' - should now be explored through empirical study of the HER in use by everyday householders. The research findings will be used to confirm or modify the framework. The conceptual framework might then be used as the basis for recommendations for improving the seller's pack HER based on an everyday householder-centred approach.

6.6 References

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- DETR (2000c). Climate change: the UK programme. London, HMSO.
- DETR (2000f). Seller's information pack: discussion paper on the inclusion of an energy report within the home report. (Internal paper).
- DETR (2000g). The key to easier home buying and selling: a consultation paper. London, HMSO.
- ODPM (2003b). Reforming the buying and selling process in England and Wales: contents of the home information pack, a consultation document. London, HMSO.

7. The householder response to the Home Energy Report: method

7.1 Chapter outline

This chapter describes the methods used to carry out an empirical study of the home energy report in use. First, the chapter introduces the research collaborators and the specific home energy report programme being studied. Then the aims of the study are identified. Finally, the data collection and analysis methods are outlined for each of the two stages of the research and the limitations of the study are made clear.

7.2 Background

7.2.1 Mortgage lender Home Energy Reports

It was discovered through interviews with the DETR that a home energy report similar to that proposed by the Government was already provided for homebuyers by a select number of mortgage lenders in Britain (see chapter 6 and appendix A). Despite the lack of parliamentary success of the Energy Efficiency Bill (requiring mortgage lenders to provide a home energy report for every borrower before the grant of a mortgage) some high street mortgage lenders reacted by piloting the use of energy reports, issuing them with standard home condition survey information. In 2001/2, these reports continued to be provided by a limited number of lenders and their surveyors.

Further enquiry and direct communication with the mortgage lenders identified the Cheltenham and Gloucester, Abbey National, Norwich and Peterborough Building Society, Ecological Building Society and The Woolwich among those lenders to provide the reports at the time¹. No evidence was found of any previous evaluative research focussing on the home energy report in-use in this context². This situation presented an opportunity to learn much about the strengths and weaknesses of the home energy report, as well as the relationship between the 'everyday householder' and this type of programme, through the very householders who had received information and advice by these means.

¹ The Nationwide building society had apparently used home energy reports in the past, but by this time their use had been terminated. The Co-operative Bank was due to introduce mortgages in the near future and apparently intended to include the provision of an energy report at some point.

² Although it was later discovered that in March 2000 Chris Reynolds, then Environmental Manager of Woolwich plc, had requested a survey of Woolwich/Ekins clients to be carried by the Environmental Change Unit at Oxford University. This survey pro-forma was not distributed to clients until July 2001.

7.2.2 Research collaborators: Ekins Surveyors of The Woolwich plc

While the Norwich and Peterborough and the Ecological Building Societies both expressed interest in the research, the Abbey National, Cheltenham and Gloucester and The Woolwich were identified as preferred collaborators, since they provided energy reports with standard mortgage types and they also had a large customer base. The Norwich and Peterborough Building Society advertised their relevant mortgage product as a 'green' mortgage, to which conditions were attached, and the Ecological Building Society is a small specialist organisation, known for its commitment to low environmental impact construction and refurbishment. On these grounds, it was felt that customers who had received energy reports from the latter building societies would be more likely to have a positive attitude to domestic energy efficiency, engage in pro-environmental behaviour and react positively to the home energy report than the homeowner-occupier population at large. It was felt that a less biased sample of owner-occupiers could therefore be gained from one of the lenders offering advice in a 'mainstream' mortgage package.

The Abbey National did not agree to take part in the research. The Cheltenham and Gloucester agreed to take part, however, their energy report programme was still being piloted and hence only a small sample of customers was possible. This limited customer base was therefore used as a pilot for the final study (see 7.4.2). Ekins Surveyors, a Woolwich plc business, was keen to be involved in the research. Since the Woolwich is a major High Street mortgage lender in Britain, Ekins distributed energy reports to a large number of customers on a daily basis, offering the potential to gather a relatively large amount of data in a short space of time. This is the channel through which data were gathered for the main study.

7.2.3 Programme description

Home energy surveys were introduced by Ekins in September 1998, being carried out in conjunction with the standard mortgage survey. By January 1999, all Woolwich plc new mortgage customers received a Home Energy Report (HER) as part of the standard HomeFiles. These files are issued as 'log-books' for the home and contain all the standard home condition information. The HER is intended to 'add value' to the Woolwich's mortgage service³.

³ Ekins won the 'Home Energy Rater of the Year' award at the 1999 National Home Energy Rating conference, going on to win the lifetime award for commitment to promoting energy efficiency in 2000. National Energy Services (NES) software was first used to produce the report: both NES and Elmhurst Energy Systems software were used at the time of this survey.

The HER is introduced to householders in the HomeFile covering letter as follows:

'This section of the report prepared by our specially trained surveyors includes recommendations for the most cost-effective improvements to save energy, reduce heat loss and save you money. If you wish to take action on some of the recommendations made, the Woolwich may be able to assist you further.'

The two versions of the Ekins home energy report are similar in format and content to that piloted for the UK Government in 1999/2000, as part of the proposed seller's information pack (see figures 6-1 & 6-2). First, a description of the NES version (see figures 7-1 – 7-3).

Energy Rating Report

For
106 Corring Way, Ealing, London W5 3HA

Home Energy Rating: 30 to 40

Estimated Fuel Costs: £1012
(includes heating, lighting and all appliances)

This property already has the following Energy Efficiency features installed:
Double glazing (part only)

The best improvement options for this property are:

| | Aproximate cost | Annual Saving | Payback (years) |
|-------------------------|-----------------|---------------|-----------------|
| Cylinder jacket | £20 | £25 | 0.8 |
| Loft insulation (150mm) | £220 | £45 | 4.9 |
| Low energy lights | £110 | £20 | 5.5 |
| Condensing boiler | £1,600 | £180 | 8.9 |

Date of issue: 19 March 2001

The Government has given National Energy Services Ltd authorisation to issue SAP home energy ratings using the Government's Standard Assessment Procedure.
© National Energy Services Ltd

Serial Number 378565 Reference XA115891/000

See attached notes for explanation of ratings, costs and savings

Figure 7-1: NES version of the Ekins HER, page1

The first page presents the current energy rating for the dwelling and estimated annual fuel costs. It then lists those energy efficiency features already installed and lists the

'best improvement options' for the property, giving the approximate initial cost, resulting annual savings and hence the payback in years.

| Energy Report (continued) | | EKIN | | | | | | | | | | | | | |
|---------------------------------------|--|---|--|---------------|------|---------------|------|---------|-----|-----------------------|------|------------------|-----|-------------------|---------------|
| 106 Comrag Way, Ealing, London W5 3HA | | | | | | | | | | | | | | | |
| Condensing boiler | This option is best taken up when the present boiler requires repair or replacement. Condensing boilers have a much higher efficiency than other types of boiler. Since they require a drain you are recommended only to use a plumber familiar with their installation. For details of cashback scheme call 0800 512 012. | Cost £1,600 | Saving: £180/yr Payback: 8.9 yrs | | | | | | | | | | | | |
| Cylinder insulation jacket | This is based upon an insulation contractor installing an insulating jacket 80mm thick to the hot water cylinder. Alternatively you could do-it-yourself, taking care to fit the jacket over the top of any thermostat clamped to the cylinder. | Cost £20 | Saving: £25/yr Payback: 0.8 yrs | | | | | | | | | | | | |
| Loft insulation | The cost is based upon a contractor installing 100mm of glass fibre or mineral fibre in the loft. This ensures a professional installation. If you elect to do-it-yourself you should wear gloves and a mask when handling the insulation. Take care not to block ventilation at the edge of the loft space, otherwise condensation and dampness may result. | Cost £220 | Saving: £45/yr Payback: 4.9 yrs | | | | | | | | | | | | |
| Low energy lights | These cost a lot more than ordinary incandescent lamps but last a lot longer (typically five times longer) and use a lot less electricity (about a fifth). Use these lamps in hallways, the kitchen, lounge and other places where lights are left on the most. Cannot be used with dimmer switches, and may not fit some lampshades/light fittings. | Cost £110 | Saving: £20/yr Payback: 5.5 yrs | | | | | | | | | | | | |
| Breakdown of running costs | The estimated annual running cost for this property can be broken down approximately as follows: | <table border="0"> <tr> <td>Space heating</td> <td>£552</td> </tr> <tr> <td>Water heating</td> <td>£150</td> </tr> <tr> <td>Cooking</td> <td>£40</td> </tr> <tr> <td>Lights and appliances</td> <td>£200</td> </tr> <tr> <td>Standing charges</td> <td>£70</td> </tr> <tr> <td>Total cost</td> <td>£1,012</td> </tr> </table> | | Space heating | £552 | Water heating | £150 | Cooking | £40 | Lights and appliances | £200 | Standing charges | £70 | Total cost | £1,012 |
| Space heating | £552 | | | | | | | | | | | | | | |
| Water heating | £150 | | | | | | | | | | | | | | |
| Cooking | £40 | | | | | | | | | | | | | | |
| Lights and appliances | £200 | | | | | | | | | | | | | | |
| Standing charges | £70 | | | | | | | | | | | | | | |
| Total cost | £1,012 | | | | | | | | | | | | | | |

Figure 7-2: NES version of the Ekins HER, page 2

On the second page more detail is given about each improvement option. This includes information such as whether or not the estimated cost is based on DIY or professional installation, when is the best time to make improvements (e.g. boiler replacement), and some tips about what to avoid and what to do when installing and using the measures. Also included on this page is a total and breakdown of the running costs for the property according to: space heating; water heating; cooking; lights and appliances; and standing charges. The third page gives an explanation of the assumptions made in calculating estimated fuel costs and potential savings and an explanation of the terms used. There is also an explanation of the energy rating, with a typical rating for the relevant property type. A bar chart shows the cost of heat lost through the loft, walls,

floor, windows, draughts and heating system, and the potential savings possible through the recommended measures.

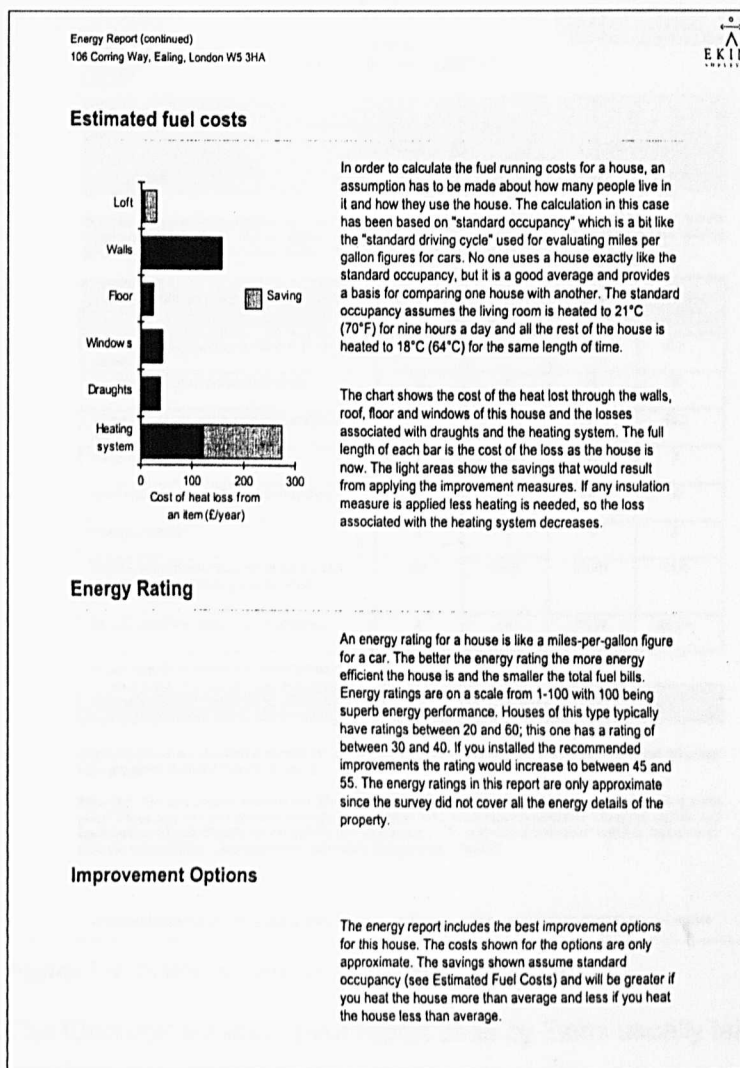


Figure 7-3: NES version of the Ekins HER, page 3

By comparison, the DETR piloted report takes only two pages. It differs from the latter version in that it includes a potential SAP rating for the property on the front page, along with an explanation of the SAP rating and a link to CO₂ emissions and global warming. The DETR report does not give any further information about each recommended improvement option, but includes some very general information about insulation and heating improvements and about solar heating and low energy lighting. Neither is there a breakdown of the cost of heat loss (or any reference to heat loss at all) or potential savings through the various elements. However, the DETR report does give an exact SAP rating as well as a 'SAP band', from very poor to excellent.



Address:
2 Kingscote Drive
Abbeymead
Gloucester
GL4 4XT

**HOME
ENERGY RATING REPORT**

Ref. No ALS/CM/87
Issued on 21/09/2001
Case Ref. X2082038.EKN

| The property before improvements | | |
|----------------------------------|----------------------------|---------------------------------|
| SAP Rating | Estimated fuel bill | CO₂ emissions |
| 35 points out of 100 | £315.74 per annum | 2.31 tonnes per annum |

The following table demonstrates how you may increase the SAP rating and reduce the fuel bill for your home's space and water heating. The installation costs are an indication of what a contractor might charge for carrying out the improvements but a cheaper alternative may be DIY where appropriate. (Prices Incl. VAT)

| Individual Improvements | Extra SAP Points | Annual Saving | Installation Cost | Payback Years |
|--|------------------|---------------|-------------------|---------------|
| Hot water tank, make up to 100mm (4 inches) Jacket | 8 | £45 | £30 | 0.7 |
| Draughtproof all doors and windows | X | X | X | X |
| Increase roof insulation thickness to 200mm (8 inches) | 1 | £5 | £81 | 16.2 |
| Install cavity wall insulation | X | X | X | X |
| Solid wall add 50mm (2 inches) insulation | X | X | X | X |
| Heating controls | X | X | X | X |
| Install fully controlled gas condensing boiler and radiators for heating and hot water | 29 | £108 | £1571 | 14.5 |
| Double glaze the single glazed windows | 2 | £8 | £829 | 25.0+ |

*X denotes no improvement recommended

| | | | | |
|--|-----------|-------------|--------------|-------------|
| Total of all above improvements | 40 | £166 | £2311 | 14.0 |
|--|-----------|-------------|--------------|-------------|

The table above is calculated cumulatively. Consequently the improvements in the bottom half of the table may have a greater impact if done individually.

Warning: The calculations assume that the existing insulation and heating system are in good working order (even if they are not) and likewise although the improvements listed assume suitability this is not implied and appropriate advice should be sought before proceeding. To understand this report fully it is important to read the section titled "Understanding Your Home Energy Rating Report".

Figure 7-4: Elmhurst version of the Ekins HER, page 1

The Elmhurst version of the report used by Ekins usually takes four pages, plus a certificate showing the SAP rating and property address etc. On the first page (see figure 7-4) the current SAP rating, estimated annual fuel bill and associated CO₂ emissions are given. Recommended measures called 'individual improvements' are also given in table form, along with the extra SAP points, financial saving, installation cost and payback associated with each measure.



Address:
2 Kingscote Drive
Abbeymead
Gloucester
GL4 4XT

**HOME
ENERGY RATING REPORT**

Ref. No ALS/CM/87
Issued on 21/09/2001
Case Ref. X2062036.EKN

The table below demonstrates the benefits of carrying out all of the recommended improvements.

| Summary of findings | SAP Points | Fuel Bill | CO2 Tonnes |
|--|------------|-----------|------------|
| The property SAP, fuel bill & CO2 emissions before improvements are estimated at | 35 | £315.74 | 2.31 |
| The total extra SAP points & estimated savings from improvements are | 39.81 | £165.05 | 0.90 |
| The new projected SAP, fuel bill & CO2 is | 75 | £150.69 | 1.40 |

The existing SAP is 35 and the maximum SAP is 75,

therefore $\frac{35}{75} = 47\%$ achievement so far.

In certain circumstances it may be cost effective to consider a change of heating fuel and heating system instead of the existing system or the one recommended.

For this particular property however a fuel change is not considered cost effective.

Figure 7-5: Elmhurst version of the Ekins HER, page 2

On the second page (figure 7-5) a summary is given of the SAP, fuel bill and CO₂ emissions estimated before and after improvements. Then the existing SAP is given out of 'the maximum', which in the example is less than the 100 given on page 1. Fuel change is also considered and could be recommended on this page.

UNDERSTANDING YOUR HOME ENERGY RATING REPORT

The SAP

This report has been independently processed by Elmhurst Energy Systems using calculations set by The Governments Standard Assessment Procedure. The SAP awards an energy efficiency score to the home on a scale of 1-100 points.

| SAP Ratings | Efficiency Level |
|-----------------|------------------|
| 1 - 10 points | VERY POOR |
| 11 - 30 points | POOR |
| 31 - 50 points | STANDARD |
| 51 - 60 points | GOOD |
| 61 - 80 points | VERY GOOD |
| 81 - 100 points | OUTSTANDING |

**What can be achieved?**

Most properties are unable to be improved above 80 points. This report has considered the property improvement in practical terms and the "Achievement" figures on Page 2 will read 100% when all the practical measures have been taken and the existing SAP matches the maximum SAP.

How does the fuel affect the SAP?

The combined price and efficiency of fuels is important as the more expensive and inefficient the fuel the poorer the SAP. From worst to best the order is Electric, LPG, House Coal, Mains Gas and Oil. It is possible to improve the SAP and the fuel bill by using cheaper fuel but without improving the CO₂ (Carbon Dioxide) as the CO₂ is related to the amount of fuel used e.g. changing on peak (expensive electric) heaters to off peak (cheaper electric) heaters.

The fuel bill

The estimated fuel bill and the SAP have assumed that the whole of the property is heated to normal heating standards. Consequently the annual savings are only estimated and may not necessarily reflect the present living style.

Installation cost

The installation costs used are only approximate and may vary up or down when they are subjected to actual quotations. Each improvement has a built-in minimum charge so there may be further savings if two or more improvements are carried out at the same time. Where possible only use contractors that are backed up by national or industry wide guarantees.

Insulation and heating improvements

New homes are built to high standards of energy efficiency. Unfortunately most homes are not energy efficient being built before the present standards of insulation were required and when heating systems and controls were less sophisticated. By improving your home insulation and heating you can achieve all the warmth when and where you want it. Good heating and insulation often means less condensation and also may increase the market value of your home.



© Elmhurst Energy Systems Ltd. Registered Office Elmhurst Farm, Bow Lane, Withybrook, Nr Coventry, CV7 9LQ, Reg No. 2805046

ELMHURST ENERGY SYSTEMS LTD

Figure 7-6: Elmhurst version of the Ekins HER, page 3

The third page (figure 7-6) gives SAP bands similar to that on the DETR report and explains the SAP scale and realistic maximum. It also explains, in principle, the effect of fuel type on SAP rating. Assumptions made in calculating estimated fuel bill are explained, as are the estimated installation costs and more general information about insulation and heating improvements. The final page (figure 7-7) includes an explanation of payback, CO₂ and the link to global warming and offers further improvements not included in the report, namely solar heating and low energy lighting.

Payback

In the table the "Payback Years" is the period over which the cost of the improvement is expected to be recovered through savings on fuel bills. Expensive items with longer payback periods may only prove to be cost effective if they are attended to when replacement is required.

CO₂ Tonnes - Carbon Dioxide

The Report shows you how to save money on your heating costs, BUT you are not just helping yourself you are also helping the environment.

Most of our energy comes from burning fossil fuels - coal, oil and gas either directly or from generating electricity. All this burning releases CO₂ (Carbon Dioxide) into the atmosphere. Carbon dioxide is the main contributor to global warming, the greenhouse effect, which is threatening the world in which we live. The UK is committed to reducing carbon dioxide to 20% below the 1990 level by the year 2010.

Further Improvements not Included in this report

Low energy lighting. Low energy light bulbs are a very worthwhile investment. Energy saving light bulbs cost between £5.00 and £15.00 each, BUT they last 8 times longer than ordinary light bulbs and this benefit added to the reduction in electricity means each one will save you about £10.00 per year.

Solar heating. The UK has over 40,000 solar water heating systems. Providing approximately 60% of domestic hot water needs, typical installation costs vary from £800 for a "Do It Yourself" system, to £3,000 - £4,000 for a commercial system. For an average 3 bed semi-detached house whose water heating bill for an on peak immersion is about £300 per annum a commercial system would have a payback period between 15 and 20 years.

Conditions

Elmhurst is independent of any fuel suppliers or contractors and therefore does not recommend any particular supplier or contractor for implementing improvements set out in this report. It is impractical to investigate every part of the structure of an existing property but most follow a pattern in methods of construction and layout. This enables certain assumptions to be made but there are individually styled dwellings where the assumptions and, accordingly, the SAP may not be entirely accurate. This report may be reliant on information provided by the occupant or others and therefore Elmhurst cannot be held responsible for inaccuracies in the information used to produce this Report.

Warning: The calculations assume that the existing insulation and heating system are in good working order (even if they are not) and likewise although the improvements listed assume suitability this is not implied and **appropriate advice should be sought before proceeding.**

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Figure 7-7: Elmhurst version of the Ekins HER, page 4

The DETR report, also being produced with the Elmhurst software, shares all of the features of the last two pages of the Elmhurst report used by Ekins, except that it condenses these onto one page, excluding the information about the realistic maximum SAP altogether. The front pages of the two reports are also similar, except that the DETR version includes SAP bands, contrasting potential and actual rating, and gives a total SAP, financial saving and CO₂ reduction at the start, only breaking down cost and financial savings according to each recommended measure.

In summary, the piloted DETR version of the home energy report is similar to those used by Ekins. The main difference appears to lie in the fact that the DETR report has been condensed to two pages only and therefore gives less explanatory text. In addition, some effort has been given to trying to make the DETR report more eye-catching and vivid through graphical techniques.

7.3 Aims

Drawing on the guidance provided by the conceptual framework, this study takes a householder-centred approach to programme development. Owner-occupiers have, therefore, been invited to participate in the process of defining a 'solution' to the problem of how to engage owner-occupiers in energy efficient home improvement. This type of participatory research not only has considerable theoretical interest, it also has the potential to provide the knowledge needed so that more appropriate alternatives can be generated for future uses of the same procedure (Kaplan and Kaplan 1989:83). Therefore, the study findings relate both to the developed conceptual framework and also to the generation of a more appropriate means to engage owner-occupiers in energy efficient home improvement. Accordingly, the aims of the study are as follows:

- To evaluate whether or not the home energy report initiates energy efficient home improvement among owner-occupiers;
- To explore the validity of the proposed conceptual framework, 'an everyday householder-centred approach to programme design';
- To permit the 'everyday householder' to inform the development of a more effective home energy report.

With regard to the first aim, the rate of intended take-up of recommended energy efficiency measures is used to provide an indication of the report's current effectiveness. This is then compared to the actual take-up rate for a small sub-sample of the householders one year later. Since there is no control for this study due to limited resources, take-up rate cannot be compared to that of similar homeowners who have received no energy report. Hence, it is not possible to measure an absolute level of effectiveness.

In order to achieve the second and third aims, an exploratory research approach has been taken which permits householder participation. The data that emerge are interpreted as either supporting (and therefore validating) the themes of the conceptual framework or conflicting with these themes (and therefore invalidating the conceptual framework). Where there are conflicts, the findings are used to further refine the conceptual framework. In this way the theory is built. The resulting data simultaneously inform the development of the home energy report programme (see Conclusions, chapter 12).

Objectives relating to specific aspects of the data collection and analysis are presented below (see section 7.4.4).

7.4 Phase 2 method

7.4.1 Instrument and procedure

As explained in the Methodology (see chapter 3), this study combines qualitative and quantitative research methods. It is in this second research phase that the qualitative meets the quantitative.

The terms of the Data Protection Act dictated that the researcher would not be permitted access to Woolwich customer details without their prior approval. A self-completion postal questionnaire was chosen, therefore, as the primary data collection method, thus allowing Ekins Surveyors to control distribution. Over the course of approximately four weeks (March/ April 2001) 2000 questionnaires and covering letters were distributed, along with the HomeFile⁴ including the HER provided by Ekins, to the first 2000 Woolwich mortgage customers due to receive the latter reports. A pre-paid envelope was enclosed for return of completed forms. Respondents could choose whether or not to provide their name, address and telephone number on the questionnaire; these details would permit follow-up research (phase 3 – see 7-5).

Statistical data were gathered using option and tick boxes and qualitative data via open-ended questions. Those questions designed to elicit quantitative data reflected the interests of the researcher, generated by the conceptual framework. The open-ended questions were intended to permit householder participation in the development of a more effective home energy report. While it is acknowledged that survey techniques can permit participation only in a limited sense⁵, the constraints imposed on this study meant that a survey was the most realistic approach. Therefore, the open questions are conceived as a means to allow the concerns of the participants to be reflected in the data alongside those of the researcher.

⁴ This is the name The Woolwich gives to the report containing all standard survey information

⁵ People tend to be uncertain of their opinions unless they have access to sufficient information on which to base them. Participatory approaches that incorporate understanding, exploration and problem-solving alongside experts have therefore been identified as preferable (see Kaplan 2000: 501).

7.4.2 Pilot study

A pilot was carried out prior to the main study in order to test the questions for ambiguity. This study used mortgagees of the Cheltenham and Gloucester (C&G) as the sample. Like the Woolwich plc, the C&G is a mainstream High Street mortgage lender and it provides the home energy report along with the standard survey information. The report used by this lender was again similar in format and content to that piloted as part of the Sellers' Information Pack, although it was produced by a different authorised company – MVM Starpoint. At the time of the pilot the C&G had only just begun the 'roll-out' process for the energy report nationally, therefore the

number of customers receiving the report was low relative to The Woolwich. The questionnaires and a covering letter were included with all home energy reports administered by the C&G over a period of approximately 6 months. 20 replies were received (representing approximately 10% response rate).

The pilot revealed a mistake in one of the questions and some ambiguity in another question. Both questions were modified for the questionnaire used in the main study. The wording of the covering letter was also modified in order to try to attract more respondents. Due to time restrictions, the data in the pilot were simply observed, rather than fully analysed and, therefore, some ambiguities remained in the final questionnaire. Certain assumptions have therefore been made in order to analyse the data in the main study (see appendix 15-2).

7.4.3 Sampling and limitations

The study used a sample of 256 participants, all of whom were in the process of obtaining a mortgage from The Woolwich plc. at the time of the study. All of the participants had received a home energy report relevant to the home they intended to buy, along with the standard survey information in the 'HomeFile' Report. With regard to the quantitative element of this study, the target population comprises all individuals in the process of obtaining a mortgage in England, all of whom could potentially receive a home energy report about the dwelling they intend to mortgage.

Since Ekins deals with The Woolwich mortgage customers centrally, the participants lived in different areas of England, both urban and rural. The mortgages themselves were of a standard type, and were in no way advertised to the participants as relating to energy efficiency; therefore, it is reasonable to assume that the sampled population represented views (and relevant level of action) towards domestic energy efficiency

similar to those of the target population. The 2000 individuals in the sample population differed from the target population in the following ways: they had all chosen the Woolwich as their mortgage lender; they received survey information about the dwelling they were mortgaging at a similar time (within four weeks of each other). Since The Woolwich is considered a mainstream High Street mortgage lender, there is no reason to assume that confining the sample to customers of this lender would in any way bias the sample. There is also no reason to believe that the timing of the data collection would in anyway result in a sample bias. It can be concluded that the sampling frame for this study does not result in a significant sampling bias.

The postal questionnaire itself brings some advantages. Aside from the practical and convenience aspects that it offers, the absence of an interviewer means that potential interviewer effects are avoided. It has been demonstrated that the characteristics of an interviewer can affect the responses given and people tend to be more likely to exhibit social desirability bias (i.e. giving the answer that is perceived to be desirable) when an interviewer is present.

Response rate is particularly significant in relation to postal questionnaires, in that those who do not respond are likely to differ from those who do⁶. The lower the response rate the more likely it is that sampling bias will affect the subsequent findings. The circumstances of this particular research could not have predicted anything close to the recommended 50% response mark (see Mangione, 1995:60-1, cited in Bryman 2001:132). Due to data protection and the necessity to act through the Abbey National, there could be no direct pre-survey contact with the participants, preventing the selection of a stratified sample. Limited financial resources also meant that the information in the cover letter was the only form of incentive offered.

The 'interest factor' can increase response rates in cases where the target group members are customers of the study sponsor (Hague 1993:106). In this case, however, the survey was introduced as coming from the University of Sheffield, rather than The Woolwich and the focus of the study was not the customer's focus of interest – the mortgage itself – but a very small part of the Home File report, which the customers had not requested. In these circumstances a response rate of less than 5% is predicted (Ibid). Based on an evaluation of the constraints on the study described here the

⁶ Previous studies have found postal questionnaires likely to attract respondents who are 'more highly educated, wealthier, and more interested in the subject of the questionnaire than the population at large.' (Burt & Barber, 1996:216)

attained response rate of almost 13% is positive, comparing favourably with comparable studies in this particular area⁷.

The possibility remains that this sample is more highly educated and wealthier than the population. Sample profile data are presented in appendix C, however, a comparison of this profile with that of the target population was not possible, since national statistics exist only for all mortgagees rather than for new and re-mortgagees. The Woolwich itself was not willing to provide a new mortgage customer profile for reasons of confidentiality.

It is possible that the nature of the research, being introduced as 'an independent research project into the energy efficiency of UK homes' (see cover letter in appendix C) could have resulted in sampling bias, attracting a sample with greater than average interest in energy efficiency. However, the inclusion of a pre-paid envelope and the wording of the rest of the covering letter were intended to make participation attractive to all types of homebuyer, thus minimising the possibility of bias due to above average interest. In fact, 43% of the participants claimed never to have received any information or advice about domestic energy efficiency and a further 24% had previously received information or advice from only one source. This, put together with the spread of opinion and other selected findings (such as intended energy efficiency activity) suggests that in fact there was minimal bias in this respect associated with sampling.

7.4.4 Data analysis method

A total of 258 completed questionnaires were received (from a population of 2000). Two questionnaires were considered invalid due to large sections being missed (in one case two pages had clearly been turned together), thus leaving a sample of 256. For the purposes of this study, qualitative analysis refers to 'a non-mathematical process of interpretation, carried out for the purpose of discovering concepts and relationships in raw data and then organising these into a theoretical explanatory system.' (Strauss and Corbin 1998:11) Quantitative analysis, on the other hand, refers to the use of statistical procedures (or other methods of quantification) to arrive at findings. In accordance with the chosen multi-strategy approach (see 3.2) both types of analysis have been used.

⁷ A comparable later study into the home energy report conducted for Ekins in July 2001 attained a response rate of only 3.5% (70 out of 2000) (Darby 2002, Darby in progress). This study, also subject to the limits of the Data Protection Act distributed mail questionnaires to 2000 householders who had completed their house purchases at least one year previously. The only other known comparable study in the UK was also conducted through Ekins in 2001/2002 (New Perspectives and BMRB International 2002). This study achieved an 11.7% response rate but this was from an initial distribution of only 300 questionnaires.

The questionnaire was structured in six parts, A-F. Parts A and B requested information about the respondent and the dwelling to be purchased, using multiple-choice options (except in the case of name and address). Part C focused on the information given in the energy report, asking respondents to indicate what information and recommendations had been made, again using multiple choice options and tick boxes. In addition, the respondents were asked to indicate which measures were already installed in the dwelling and whether or not they intended to take-up the recommendations within the next year (tick boxes) or carry out any further home improvements (yes/no options and an open question). The findings relating to part C are presented in chapter 8 (see also appendix C, 15.5). Part D of the questionnaire focused on the domestic energy advice previously received by the respondent. Using tick boxes the respondent was asked to indicate from which of the stated (or other) sources information had been received and which of these sources had been particularly helpful when it came to choosing and installing energy efficiency measures. These data are presented in the appendix C, 15.5.

Section E asked participants to respond to two sets of Likert-type questions. The first set comprised questions about potential motivation factors and the second, questions about potential barriers to adopting energy efficiency measures. Each set was made up of 10 items. The items were constructed based on literature review findings in which perceived motivation factors and barriers were identified from previous studies. The items combine a number of personal and situational variables that might intervene in the homeowner's decision-making process. For each of the motivation factors considered, participants were asked to indicate how important each reason was to them. A Likert scale was used from 1= *not at all important* to 5= *extremely important*. For each of the barriers considered, participants were asked to indicate how likely it was that each barrier would stop them from adopting energy efficiency measures. In this case a Likert scale was used from 1= *not at all likely* to 5= *extremely likely*. Findings relating to section E are presented in chapter 8, section 8.4.

The final section, F, asked a series of questions designed to ascertain the views of the householder on the energy report and on the idea of a follow-up advice service. Yes/no response questions were followed with open questions and in one case tick boxes were provided to indicate which type of occupations would be considered suitable energy advisors. These findings are presented in chapter 10. Finally, space was provided for any other comments and participants were asked if they would participate

in a follow-up telephone interview at a later date. For an example of the questionnaire see appendix C, 15.1.

Statistical analysis: objectives

1) To describe sample data frequencies and use these to describe the sample population.

The following data were treated in this way:

- Overall level of take-up of recommended measures;
- Percentage of households who intend to adopt at least one recommended measure;
- Could the report be improved?;
- Would it be helpful to have an advisor to ask questions related to the energy report?;
- Would it be helpful to have an advisor to ask questions about energy efficient home improvement in general?;
- Do householders intend to do non-energy efficient home improvements?;
- Would householders use a free follow-up advice service?

2) To determine the relative importance or popularity, according to the householders, of individual items through the following data sets:

- Intended take-up rate of each energy efficiency measure;
- Importance of each factor motivating take-up;
- Importance of each barrier to take-up;
- Popularity of each potential energy efficiency advisor.

3) To determine the effects of independent variables relating to the householder on the following dependent variables:

- Overall take-up rate of recommended measures*
- Take-up of at least one recommended measure*
- Intention to carry out other home improvements

***Manipulation of the data was necessary to carry out this analysis**

The independent variables that were tested differ for each dependent variable and are hence described along with the results.

4) To identify any factors that might influence homeowner decision-making, underlying the motivating factor and barrier data.

Statistical test selection

The analysis is founded on an approach proposed by Robson (1993), who suggests that parametric tests be used unless the data are obviously non-normal or in the form of ranks. Since these data fulfil both of the latter criteria, non-parametric tests were selected for analysis. The calculation of sample population parameters from the sample, however, relies on the sample being stratified to be approximated to a normal distribution. It is acknowledged that in this particular case some error could have arisen due a lack of stratified sample. All other non-parametric statistical tests were carried out using SPSS 10.1 for Windows. Test selection was based on background reading in SPSS and through use of the SPSS statistical coach within the software itself.

1) Describing the population from the sample

Descriptive statistics resulted in frequencies for each data set and the expression of these frequencies as a percentage, or proportion, of the whole sample (using valid data only). A confidence interval was then calculated for the proportion, by first calculating the standard error (s.e.) for the sample estimate:

$$\text{s.e.} = \sqrt{\frac{\rho(1-\rho)}{n-1}}$$

where ρ = sample estimate proportion, expressed as a decimal, and n = sample size
Then using the following formula:

confidence interval for proportion = $\rho \pm Zs.e.$,

where Z = number of standard errors (1.96 used - 0.05 significance level)

This resulted in a proportion range for the sample population, within which one could be 95% certain that the true value would lie.

2) Rankings

The data sets were ranked according to their mean value in order to gain an impression of the relative popularity of each item.

3a) Difference between means

In order to identify those independent variables with an effect on other variables (dependent), the data were tested for significant differences between the mean values of each level within the independent variable. In most cases more than two levels existed within the independent variable and therefore analysis of variance was appropriate. Significance was noted at the 0.05 probability level. As the participants were different for each level, tests were required for between subjects (unrelated) data. Non-parametric tests were used since the data did not satisfy the normality assumption. Data were nominal, ordinal and interval. Where the independent variable was measured at the nominal level, the Kruskal Wallis test was used. Where it was measured at the ordinal level, the Jonkheere Terpstra (JT) test was used, as this is more robust than the Kruskal Wallis (KW) test in this situation (source: SPSS 10.1 statistics coach).

Where there were only two levels within the independent variable, the Mann-Whitney test was used for nominal, ordinal and interval data. Where data were binary (dichotomous nominal) the Chi square test was used in the case of two or more groups within the independent variable.

3b) The strength and direction of association between variables

Where data were ordinal or interval, association between variables was tested by calculating Spearman's rank correlation coefficient (noting significance at the 0.05 level). The positive or negative sign of the coefficient indicates the direction of the relationship between variables. For binary (dichotomous nominal) data, the Chi square test itself provides a measure of association between variables. It is, of course, inappropriate to try to measure the direction of the association for binary data.

4) Factor analysis

Exploratory factor analysis was carried out using the motivation factor and barrier data, in order to determine underlying factors influencing the decision-making of homeowners. For the purposes of exploratory factor analysis, the responses to the items (Likert scores 1-5) are regarded as variables. The analysis seeks to identify any underlying pattern in the structure of the variables, in an attempt to reduce the data to a smaller number of source variables (or factors). No assumption is made about the number of determinants which influence the response pattern of the subjects, however, the data obtained from the analysis are interpreted by the researcher in order to identify common latent trends, which result in the variable structure pattern obtained. Where a

common determinant affects two variables it may be anticipated that there will be a degree of correlation between those variables. Factor analysis allows the researcher to produce an array of correlation coefficients from the raw data and then be able to reduce that data to the source variables, which account for the inter-relationships displayed. Each extracted component explains a portion of the variance in the results.

The principle component analysis extraction method was used to obtain the initial factor solution and formed uncorrelated linear combinations of the observed variables. A Varimax rotation with Kaiser Normalisation was used to minimise the number of variables that have high loadings on each factor, hence simplifying interpretation of the results. The interpretation of variables with high loadings on each factor was qualitatively carried out by the author.

In this study, the source variables are assumed to be the factors influencing the homeowner's intention to adopt energy efficiency measures. The scores for each individual on each factor indicate the way in which the factor influences the individual's intention. The identification of factors is intended to aid understanding of the nature of the homeowners' decision-making processes when considering adoption of energy efficiency measures.

Qualitative analysis: objectives

To identify the emergence of themes in the views expressed by householders through the open questions, particularly in the following areas:

- Suggested ways in which the home energy report could be improved;
- What type of further information the respondents would seek regarding the energy report, should a suitable advisor be available;
- What type of further information the respondents would seek regarding energy efficient home improvement in general, should a suitable advisor be available.

Qualitative analysis: method

The qualitative data have been interpreted by the researcher and the concepts represented in the data categorised according to emergent themes. The categories have been quantified according to the frequency of entries, however, no further statistical analysis has been carried out. The researcher has attempted to represent the perspective of the respondents, however, in labelling the themes, the researcher has also used the developed conceptual framework to provide a critical perspective. Hence

the data are viewed as a means to either validate or invalidate the themes of the conceptual framework itself.

7.5 Phase 3 (follow-up) method

7.5.1 Instrument and procedure

Data were collected approximately one year after the initial survey through telephone interviews, which combined qualitative and quantitative techniques. In part, the interviews were semi-structured: a series of questions formed the general interview guide (see appendix D, 16.1 for example)⁶, but as in research phase 1, the interviewer could vary the order of the questions and their wording and ask further questions in response to what were seen as significant replies. However, the researcher had by this stage also identified a specific set of research questions that she wanted to investigate quantitatively. The gathering of this data was necessarily structured and hence questions were framed in such a way as to maximise the reliability and validity of measurement. Similar wording was used for these questions from interview to interview and they were generally asked in the same order relative to each other. In combining the qualitative and quantitative approaches, each interview, therefore, potentially reflected the concerns of both the interviewer and the interviewee.

This third and final phase of the empirical research had the obvious advantage over phase 2 that a year had passed since the homeowners had received the home energy report. There was thus an opportunity to find out whether or not intention had been turned into action; a take-up rate based on actual take-up rather than intended take-up could potentially be calculated. In addition, the actual popularity of the various recommended measures could be investigated and compared to the expected popularity. In summary, the actual householder experience in engaging (or not engaging) in energy efficient home improvement could be explored and compared with the householders' prior intentions and expectations. The interview guide therefore sought to investigate the following questions.

- What was the actual take-up rate of energy efficiency measures recommended in the home energy report?
- Which energy efficiency measures have been installed?

⁶ A core set of questions was common to each interview, however, a different guide was written for each individual to take into account the previous responses of the interviewee in phase 2.

In addition, a qualitative investigation was intended to identify any further support for the themes of the conceptual framework. The following areas were explored:

- The homeowner experience in pursuing energy efficient home improvement.
- The perceived impact of energy efficient home improvement on everyday life.
- The homeowner's motivation for and perceived barriers to energy efficient home improvement.
- The homeowner perspective on energy efficient home improvement within the context of *general* home improvement and issues relating to homeownership.

A number of other questions (mainly closed) relating directly to the development of the HER programme were posed which had not been addressed in the previous stage of research. These appeared to be important in the light of previous finding and the conceptual framework itself:

- Which would be the preferred (more credible) source of the home energy report: a government approved advice provider or an independent advice provider?
- Would the householder prefer to receive the energy report as part of the seller's pack, or directly from the relevant mortgage lender?
- Would it be better from the householder's perspective if the energy report information were integrated into the general home condition report or kept entirely separate?
- What other occasions do householders believe it would be useful to receive domestic energy advice and what would be the possible sources/providers of this advice?

7.5.2 Sampling

The sampling frame was made up of those participants in phase 2 who had expressed a willingness to take part in a follow-up interview and who had provided their contact details. In effect this meant that those people who had provided mobile phone numbers or work numbers could potentially participate in phase 3, since none of the participants yet knew the telephone number for their new home and the new address was not provided. The sampling frame numbered 30 people.

The sample itself was defined by response. Since the interviews were carried out a year after contact details had been provided, some details had changed due to change

of ownership of phone or change of job etc. In two instances the participant could not remember completing the questionnaire in phase 2 or providing contact details and so was wary of the interviewer and did not want to provide a follow-up interview. A few participants could not be contacted despite repeated attempts. In total 21 interviews were carried out. One interviewee had not bought the home on which the initial questionnaire focussed and therefore certain follow-up questions were not relevant.

Sampling limitations

Despite the fact that the sample was self-selecting and most were defined by their mobile phone use, the spread of opinion and activity represented in the data suggests that the sample is more representative of the sample population than might be expected based on an assessment of the sampling technique alone (see appendix D, 16.2). However, the small sample size clearly limits the validity of any inferences that can be made from the data. The findings of phase 3 are, therefore, used primarily to suggest areas for further research rather than to provide conclusive results about the sample population.

7.5.3 Data analysis method

The qualitative data were analysed qualitatively, using a post-coding approach (explained in more detail in the phase 1 method at 4.2). Some of the concepts identified in chapters 4 & 5 were explored in more detail and their relationships studied. Although data relating to the researcher's closed questions have been quantified, the small sample size means that interpretation of this data is also necessarily qualitative.

7.6 Summary

Drawing on the guidance provided by the conceptual framework the empirical study of the home energy report in use has taken a householder-centred approach to programme development. In order to pursue this approach, householders themselves were invited to participate in the process of defining a 'solution' to the problem of how to engage owner-occupiers in energy efficient home improvement. Data were gathered in two phases: when the householders first received the home energy report and then one year later. A self-completion questionnaire and a follow-up telephone interview enabled the researcher to gather quantitative and qualitative data, thereby representing both the concerns of the researcher and the everyday householder. The limitations of the study due to sampling and response rate have been noted and the chosen data analysis methods justified. Chapters 8 – 10 present the findings of this empirical study of the home energy report in use.

7.7 References

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8. The take-up of home improvements

8.1 Chapter outline

This chapter presents the first set of findings from phases 2 and 3 of the empirical research, focusing on the take-up of home improvements and related motivation factors and barriers, as perceived by householders. The relative popularity of the recommended energy efficiency measures is discussed in relation to the identified reasons for and against take-up. The chapter also explores the take-up of other types of home improvements, discussing the opportunity they might present to integrate energy efficiency. The results are used as a means to validate or invalidate the proposed conceptual framework, focusing on the developed concept of the 'everyday householder' and associated themes.

8.2 Energy efficient and other home improvements

8.2.1 Recommendations

A total of 922 energy efficiency measures were recommended in 246 valid energy reports (10 missing responses). The four most frequent recommendations were: energy saving light bulbs (16.5%); draught-proofing (14.6%); loft/ roof insulation (14.5%); cavity wall insulation (13.0%). Least frequent were secondary glazing, double-glazing and pipe insulation (plus other miscellaneous measures). See figure 8-1.

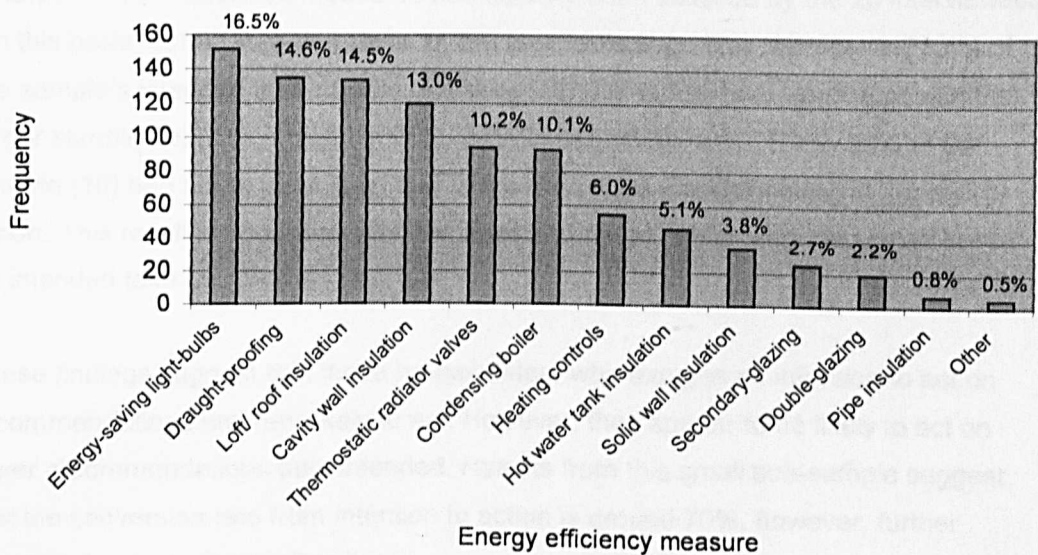


Figure 8-1: Recommendations made

'Take-up' here refers to the intention of homeowners to install energy efficiency measures within a year of recommendation. The overall rate of take-up was 27.1% ($\pm 5.7\%$; $n=231$, $p<0.05$). This figure is based on the total number of recommendations made and the total number of those recommendations that the respondents claimed they intended to install.

By contrast, 46.3% ($\pm 6.4\%$; $n=231$, $p<0.05$) of respondents who received recommendations (and gave valid responses) intended to install at least one of the recommended energy efficiency measures within the next year. This figure seems more promising than the overall take-up rate, although it is necessary to look at the frequencies for each individual measure to gauge this result in terms of improved domestic energy efficiency (see section 8.2.2).

Approximately one year later the phase 3 sub-sample of householders ($n=20$) was surveyed to give an indication of whether or not intentions had been turned into action. The total number of energy efficiency measures recommended to this sample of householders was 80. Of these recommendations, the householders had intended to install 21 within one year. This translates into an overall intended take-up rate for this particular sample, of 26%. This is consistent with the expected range of intended take-up for the initial sample population (21.4% - 32.8%).

In total, 15 recommended measures had actually been installed by the 20 interviewees. On this basis, actual take-up rate is 18.8% (see table 8-2). This represents 71.4% of the sample's intended take-up rate and suggests that actual take-up rate among the larger sample population might instead lie between 15.3% and 23.4%. 50% of the sample (10) had taken up at least one of the measures recommended in the energy report. This result is consistent with the expected range, which was calculated based on intended take-up (39.9% - 52.7%).

These findings suggest that those householders who express an intention to act on recommendations are very likely to act. However, they appear to be likely to act on fewer recommendations than intended. Results from this small sub-sample suggest that the conversion rate from intention to action is around 70%, however, further research is needed to confirm this.

It cannot be confirmed that the HER has itself engaged owner-occupiers in energy efficient home improvement. However, there is evidence to suggest that following the recommendations made in the HER, 40% - 53% of owner-occupiers will act on at least one of the recommendations, implementing approximately 15% - 23% of all recommended improvements. Further research is needed to confirm these suggestions.

8.2.2 Relative popularity of energy efficiency measures based on intended and actual take-up

According to householder intentions, the recommended measures most likely to be adopted were: hot water tank insulation (44.7%); double-glazing (40.0%); loft/roof insulation (36.6%); and energy saving light-bulbs (35.5%). Least likely to be adopted were solid wall insulation and condensing boilers –see figure 8-2 & table 8-1. Pipe insulation (42.9% overall take-up rate) has been discounted here, due to the small number of recommendations made.

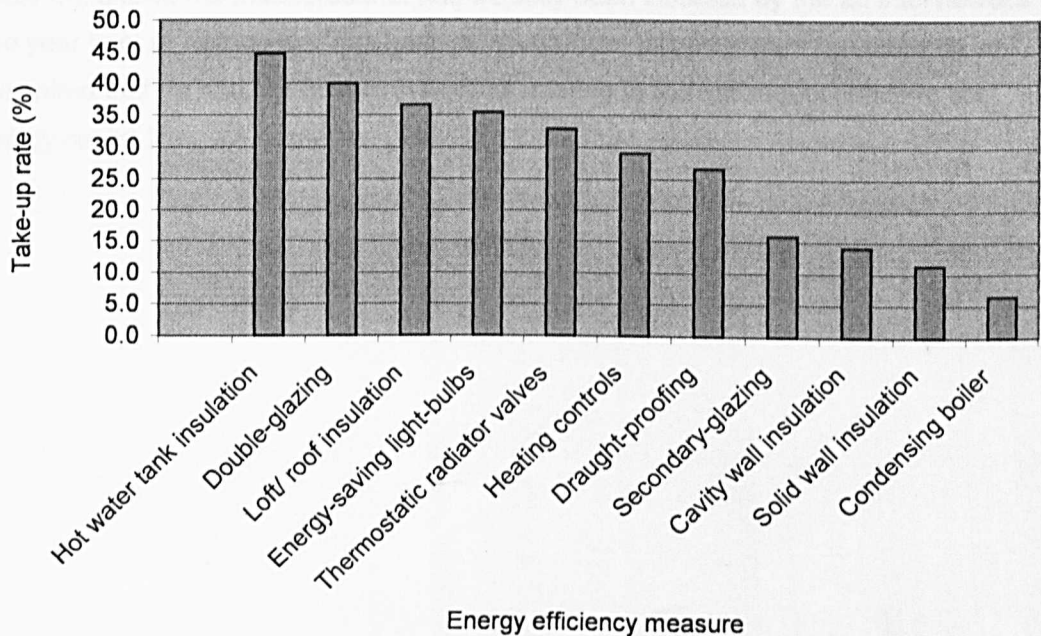


Figure 8-2: Intended take-up rate for each energy efficiency measure

| Energy efficiency measure | no | yes | Total | % yes/ take-up rate for each measure |
|------------------------------|------------|------------|------------|--------------------------------------|
| hot water tank insulation | 26 | 21 | 47 | 44.7 |
| double-glazing | 12 | 8 | 20 | 40.0 |
| loft/roof insulation | 85 | 49 | 134 | 36.6 |
| energy saving light bulbs | 98 | 54 | 152 | 35.5 |
| thermostatic radiator valves | 63 | 31 | 94 | 33.0 |
| heating controls | 39 | 16 | 55 | 29.1 |
| draught-proofing | 99 | 36 | 135 | 26.7 |
| secondary glazing | 21 | 4 | 25 | 16.0 |
| cavity wall insulation | 103 | 17 | 120 | 14.2 |
| solid wall insulation | 31 | 4 | 35 | 11.4 |
| condensing boiler | 87 | 6 | 93 | 6.5 |
| pipe insulation* | 4 | 3 | 7 | 42.9 |
| other* | 4 | 1 | 5 | 20.0 |
| Total | 671 | 250 | 922 | - |

*This measure has been discounted from the interpretation of findings and discussion due to the small number of recommendations made

Table 8-1: Intention to take-up recommendation

Table 8-2 shows the measures that had actually been installed by the 20 interviewees one year later (1 respondent has been removed from this section of the analysis as it transpired that he had not bought the house relating to the initial questionnaire and energy report.)

| Energy efficiency measure | Recommended frequency | Intended take-up frequency | Actual take-up frequency | Actual take-up of those recommended frequency | Actual take-up of those recommended % |
|------------------------------|---|----------------------------|-------------------------------|---|---------------------------------------|
| energy saving light bulbs | 12 | 4 | 13 | 8 | 66.7 |
| loft/roof insulation | 13 | 5 | 4 | 3 | 23.1 |
| thermostatic radiator valves | 11 | 4 | 2 | 2 | 18.2 |
| draught-proofing | 8 | 3 | 1 | 1 | 12.5 |
| cavity wall insulation | 14 | 1 | 1 | 1 | 7.1 |
| condensing boiler | 10 | 1 | 0 | 0 | 0 |
| solid wall insulation | 5 | 0 | 0 | 0 | 0 |
| heating controls | 3 | 1 | 0 | 0 | 0 |
| hot water tank insulation | 2 | 2 | 0 | 0 | 0 |
| pipe insulation | 1 | 0 | 1 | 0 | 0 |
| double-glazing | 1 | 0 | 4 | 0 | 0 |
| secondary glazing | 0 | 0 | - | - | - |
| Other | 1 (modern fan assisted storage heaters) | - | 1 (conservatory) | 0 | 0 |
| Other | - | - | 2 (new more efficient boiler) | - | - |
| Other | | | 1 (dual energy level shower) | | |
| Total | 80 | 21(26.3%) | 26 | 15 | 18.8% |

Table 8-2: Follow-up sample recommendations and take-up rate data

The relative frequencies of the recommendations differ from the phase 2 data. However, the pattern is broadly similar, with the 6 most frequently recommended measures and 6 least frequently recommended measures being the same in both data sets. Clearly the small sample size for phase 3 of the research means that the findings presented here cannot be taken to represent Woolwich customers as a whole. The

relative take-up rates should not therefore be read as definitive, however, certain broad inferences might be made by examining overall relationships between the data sets. The qualitative data from the open questions will be drawn upon to look for support or conflict with these inferences in chapter 9.

The following measures had not been installed by anyone in this sample: solid wall insulation; hot water tank insulation; heating controls¹; and condensing boiler. Of the measures recommended, only five types had been taken-up: energy saving light bulbs; loft/roof insulation; thermostatic radiator valves; draughtproofing; and cavity wall insulation. The rate of take-up of energy saving light bulbs (66.7%) far surpassed the intended take-up rate based on the phase 2 data (35.5%). The actual take-up rates for loft insulation (23.1%) thermostatic radiator valves (18.2%) and cavity wall insulation (7.1%) were lower than the intended rates (36.6%, 34.0% and 14.2% respectively). None of the 20 interviewees had intended to install secondary glazing, double glazing, pipe insulation or solid wall insulation – in fact, four people had installed double glazing and one had installed insulation around pipes in the loft, despite the fact that these measures had not been recommended by their reports. On the other hand, the condensing boiler, heating controls and hot water tank insulation had been intended to be installed by at least one of the interviewees, but had not in fact been pursued by anyone.

The fact that the frequency of recommendation is very low for many measures in this sample means that one should be cautious when drawing inferences from the relative take-up rates. In fact, the five recommended measures that were adopted by householders were recommended at a higher rate than all measures, other than the condensing boiler, and this might itself explain the result. The condensing boiler, however, also had a relatively high rate of recommendation but was not take-up by anyone. In the cases of draught-proofing and cavity wall insulation, only one person had actually adopted the measure following its recommendation. The fact that these three measures - the condensing boiler, draught-proofing and cavity wall insulation- are all less popular than might be expected from their rate of recommendation, suggests that particular barriers exist to their adoption. This supports phase 2 findings, where these measures were similarly found to be unpopular despite relatively high rates of recommendation. It is perhaps surprising that no one had installed hot water tank insulation, which was expected to be the most popular measure based on intended

¹ Although these were not specified it is likely that those people who had installed a new boiler had also installed new controls as part of the heating package.

take-up rate. However, this finding might simply be a reflection of the measure's low recommendation frequency in the sub-sample.

It is noted that doubleglazing and energy saving light bulbs have been installed at a higher frequency than they were recommended. Also interesting are the 'other' energy efficiency measures that have been installed by homeowners despite lack of recommendation: a conservatory; two new and more efficient boilers; and a dual energy level shower. These measures perhaps suggest further areas of home improvement which offer potential for energy savings in the market place. Clearly people are prepared to replace boilers with more efficient versions when they feel they need replacing, however, they do not appear to be either attracted to or aware of the most efficient version – the condensing boiler.

| Energy efficiency measure | Intended Take-up Frequency | % of all measures intended | Cumulative % |
|------------------------------|----------------------------|----------------------------|--------------|
| energy saving light bulbs | 54 | 21.6 | 21.6 |
| loft/roof insulation | 49 | 19.6 | 41.2 |
| draught-proofing | 36 | 14.4 | 55.6 |
| thermostatic radiator valves | 32 | 12.8 | 68.4 |
| hot water tank insulation | 21 | 8.4 | 76.8 |
| cavity wall insulation | 17 | 6.8 | 83.6 |
| heating controls | 16 | 6.4 | 90.0 |
| double-glazing | 8 | 3.2 | 93.2 |
| condensing boiler | 6 | 2.4 | 95.6 |
| secondary glazing | 4 | 1.6 | 97.2 |
| solid wall insulation | 4 | 1.6 | 98.8 |
| pipe insulation* | 3 | 1.2 | 100.0 |
| Total | 250 | 100 | |

Table 8-3: Intended rate of take-up – cumulative percentage of all measures

Table 8-3 shows that energy saving light bulbs, loft or roof insulation, draught-proofing, thermostatic radiator valves and hot water tank insulation account for 77% of all recommendations that the householders intend to adopt. Other than loft/roof insulation, these measures offer relatively little improvement in energy efficiency. While the cumulative effects of the adoption of such measures by many households will be

significant, the relative unpopularity of other more effective measures reveals the potential that is currently being wasted.

Similarly, of those recommended measures that were actually adopted, more than half were energy saving light bulbs. This measure is relatively mainstream and accessible in the marketplace. Since many householders had adopted energy saving light bulbs despite the fact that it had not been recommended, it is suggested that it is possible many of these might have been adopted without the energy report. It is more likely that the energy report played a role in motivating the installation of the other more specialised measures: loft/roof insulation; thermostatic radiator valves; draught-proofing; and cavity wall insulation. However, the latter measure was adopted by a householder who was clearly more knowledgeable than average about energy efficiency measures and home refurbishment in general. Clearly, much greater improvements in energy efficiency will be possible if barriers to the adoption of more effective measures are tackled.

8.2.3 Preliminary implications for the conceptual framework

The data presented in tables 8-1 & 8-2 potentially reflect the importance of various factors in influencing both the householders' intentions to engage in EEHI and also their actual actions. These factors will be explored in more detail in sections 8.4 & 8.5 & chapter 9 through examination of data that relates directly to the householders' perceptions of these factors. However, through qualitative interpretation, preliminary inferences might be drawn by comparing the relative popularity of the measures with their various properties.

It is clear that capital cost and payback period are not the only factors influencing the response of the householder to the home energy report recommendations. Though there is a general pattern in the phase 2 results, with the relatively inexpensive measures being more popular than the more expensive measures, anomalies exist. No clear pattern emerges from phase 3 data, however, the condensing boiler, is more expensive and less popular than all other measures with a relatively high recommendation frequency (>5). Although it is noted that the low recommendation frequency for the latter sample could account for the lack of take-up of some measures, it is clear that cost alone does not dictate the popularity of the energy efficiency measures. It is suggested that the number of factors affecting the householders' actions might be greater than that affecting their intentions.

Double-glazing proves to be more popular than its cost and payback period would suggest. The visibility of the measure is offered as explanation for this anomaly. The fact that other relatively visible energy efficiency measures do not appear to be more popular than the less visible measures suggests that this does not on its own account for popularity. Other associated factors will be explored through data presented in chapter 9, however, these findings do suggest that **familiarity** might be factor. The two measures which had actually been installed at a higher rate than they were recommended - energy saving light bulbs (esl's) and doubleglazing (dg) – are likely to be the most familiar to householders. Each of these measures is highly accessible - esl's being sold in high street shops (as opposed to a specialised DIY store) and dg enjoying proactive sales and mainstream marketing. The **procedures** involved in adopting these measures are also likely to be highly familiar to householders for the same reasons. It is, therefore, suggested that the notion of familiarity is also tied up with this idea of being 'mainstream' and hence everyday. All of the other recommended measures are more likely to be considered by householders to be specialised products.

The results of phase 2 (table 8-1) suggest that those measures more likely to be tackled DIY (hot water tank insulation, loft/roof insulation, esls and trvs are the most popular and those measures more likely to be installed by a professional (remaining measures) are the least popular. Two anomalies emerge – draught proofing and double-glazing. Cost and installation methods are of course mutually supportive; DIY measures tending to be cheaper than professionally installed measures. However, it is suggested that the popularity of DIY products might not simply be a function of cost. DIY could itself offer an extra dimension to motivation, possibly being linked to the intrinsic motivation for making a difference and being needed by enabling householder **participation**. All of the types of recommended measure that were actually installed by the householders (see table 8-2) are likely to be installed DIY, other than cavity wall insulation and double-glazing. Considering the frequency of recommendation, draught-proofing again emerges as an anomaly, being a DIY measure, but relatively unpopular. Surprisingly, hot water tank insulation remains unpopular despite its DIY status and despite the fact that it was expected to be the most popular measure based on intended take-up rate. In fact, no explanation can be inferred from these particular findings for the unpopularity of draught-proofing, hot water tank insulation or cavity wall insulation. The reasons will be explored further in chapter 9.

8.3 Other home improvements

8.3.1 Do people intend to carry out other home improvements?

This question was posed in phase 2 in order to ascertain the potential to incorporate energy efficiency into the general home improvements that people are already making. This approach would represent one possible way to reframe the message from the perspective of the everyday householder, potentially making it appear more relevant. The incorporation of energy efficiency into other improvements is also likely to reduce the amount of effort, hassle, cost and general disruption associated with the installation, hence reducing perceived **personal cost**. In effect, this approach potentially offers a means for the householder to gain the intrinsic satisfaction of competence and making a difference (i.e. **efficacy**), but at little personal cost.

| Home improvement-type | Frequency |
|----------------------------------|-----------|
| Bathroom | 38 |
| Kitchen | 35 |
| Extension/ conversion | 28 |
| Internal decoration | 28 |
| Building envelope | 25 |
| External landscape/ outbuildings | 15 |
| Conservatory | 15 |
| Flooring | 13 |
| Damp-proofing | 5 |
| Other window improvements/ doors | 12 |
| Electrical | 10 |
| Doubleglazing/new windows | 7 |
| Miscellaneous | 43 |

Table 8-4: Other non-energy efficient home improvements

55.4% ($\pm 6.3\%$, $n=242$, $p<0.05$) of respondents intend to carry out non-energy efficient home improvements to their new home. The intended home improvements have been categorised and the frequencies listed in table 8-4. (See appendix C, 15.4 for full data set.) As one might expect, most of the intended home improvements (other than damp-proofing and electrical) will have a significant visual impact, in addition to offering any other perceived benefits. While some of the measures (internal decoration, external landscape/ outbuildings, damp-proofing, electrical) offer no obvious route to energy efficiency, the three most popular measures do offer potential to incorporate efficient measures. For example, bathroom and kitchen improvements might include water-saving devices, hot water tank insulation and passive or heat exchanging ventilators. Extensions and conversions, in particular, offer enormous potential for the

incorporation of high levels of insulation as well as the use of energy efficient design principles in generation of form and use of materials etc. Conservatories can potentially be highly inefficient if people choose to treat them like any other room and heat them: information and advice could deter such inefficient practice. These few examples reflect a wealth of potential to make links to the popular **visible** home improvements planned by householders when they first move into a home. Not all of the energy efficiency recommendations would necessarily have a large impact on energy usage, however, this could represent a valuable 'foot-in-the door' possibly motivating further action further down the line. Around half of the householders intend to make some kind of home improvement: clearly potential is currently being missed.

8.3.2 Intention to carry out other home improvements and take-up

Both intended overall take-up rate and 'take-up of at least one measure' were treated as an independent variable and tested for association with intention to carry out other home improvements. Analysis revealed no significant association between the variables (see appendix C, 15.4). This result is perhaps surprising in the light of previous studies which have identified certain types of people (e.g. replacers and renovators, those who want to 'put their house in order' and nestbuilders) who are more likely to make domestic 'energy purchases' as part of other home renovation or additions, or to improve the home's look or comfort. It is possible that this type of person simply did not represent a large enough proportion of the respondents to affect the result. Clearly, the majority of householders questioned did not recognise the potential to integrate energy efficiency measures into other home improvements. It is suggested that programmes should focus on providing this type of 'integral' advice.

8.3.3 Home improvements intended one year later

| | |
|------------------------------|---|
| Loft insulation | 6 |
| Thermostatic radiator valves | 3 |
| Cavity wall insulation | 2 |
| Draught-proofing | 2 |
| Double-glazing | 2 |
| Heating system (not boiler) | 1 |
| More efficient gas fire | 1 |
| Energy saving light bulbs | 1 |
| Condensing boiler | 1 |
| Other improved boiler | 1 |
| Remove large window | 1 |

Table 8-5: Energy efficiency improvements

| | |
|--|---|
| Extension | 2 |
| Board out loft | 2 |
| Pointing/rendering | 2 |
| Solar panels ² | 1 |
| Replace doors | 1 |
| Window replacement | 1 |
| Loft conversion | 1 |
| Structural work | 1 |
| Bathroom inc new floor covering | 1 |
| Put a shower in | 1 |
| Back garden. Especially the fence, drive and the porch | 1 |
| Decorating | 1 |
| Sliding door | 1 |
| Conservatory | 1 |

Table 8-6: Other home improvements

Table 8-5 lists those home improvements which are specifically energy efficient home improvements. Loft insulation seems to be particularly popular in this context. The owner-occupiers interviewed intend to install a further 21 energy efficiency measures, 18 of which were the type of measures recommended in the home energy report. The other intended improvements are a more efficient gas fire, another boiler (not necessarily condensing) and the removal of a large window which was causing heat loss.

The home improvements listed in table 8-6, do not necessarily involve anything to do with energy efficiency, however, some could potentially include this type of measure (see 8.3.1 for examples). To ensure that these opportunities were taken, relevant information and advice would need to be made available to the householders in question when organising the works.

8.4 Potential motivation factors and barriers

| |
|--|
| To reduce fuel bills/ reduce spending on fuel |
| To reduce waste/ keep the heat in |
| To reduce energy consumption |
| To increase comfort / make the house warmer |
| To replace or repair something that has to be dealt with anyway |
| To reduce impact on the environment |
| To increase convenience |
| A loan or grant is available to part-fund the work |
| Other home improvement work is going on anyway so it is easy to do |
| To improve temperature for health reasons |

Table 8-7: List of possible reasons to adopt measures

² While solar panels are acknowledged as an 'eco' measure, they are not strictly speaking energy efficiency measures since they do not use energy from a finite source more efficiently.

| |
|---|
| I can't afford it |
| It will take too long to get the money back in reduced fuel bills |
| It will mean I can't afford other things (holidays, cars, clothes etc.) |
| I do not have the necessary DIY skills |
| I don't have enough reliable information on what to do |
| I have no time to do it/ organise it |
| It involves mess and hassle |
| I can't find a reliable installer/supplier |
| I'm not going to be living in house for long enough |
| I can't be bothered |

Table 8-8: List of possible reasons not to adopt measures

As explained in chapter 7 (see 7.4), householders were asked to respond to two sets of Likert-type questions, the first comprising 10 items relating to potential motivation factors (see table 8-7) and the second, 10 items relating to potential barriers to adopting energy efficiency measures (see table 8-8).

8.4.1 Overall motivation level

Since both motivation factors and barriers potentially contribute to an individual's overall level of motivation (the former in a positive fashion and the latter in a negative fashion), these sets of data were combined to give an overall motivation level for each individual:

$$(\text{total motivation score}) - (\text{total barrier score}) = \text{motivation level}$$

where total motivation/barrier score = the sum of all Likert scores (1-5) on the 10 relevant items.

For purposes of analysis, motivation level was treated as a dependent variable in relation to the following independent variables: take-up rate; and intention to carry out other home improvements.

Common sense suggests that there would be a correlation between take-up rate and motivation level. Spearman's rank test confirmed a significant positive correlation between overall take-up and the motivation level ($r_s = 0.193$; $n=195$, $p < 0.05$) (see appendix C, 5.11). However, since the square of the coefficient is low (< 0.3), this suggests that only a small proportion of the variation in values of one variable can be predicted from variation in the other variable (Robson, 1993:338). Hence, it is not worth investigating the relationship further through statistical methods. The Mann-Whitney test revealed a significant difference in the two mean values of the motivation level for

the groups of householders who intended to act on recommendations and those who did not ($Z = -2.292$; $n = 195$, $p < 0.05$) (see appendix C, 5.11). As expected, the mean rank for the former group was higher than that for latter (107.49 v 88.98). These findings suggest that there is some positive association between the homeowner's perception of the stated motivation factors and barriers and their intention to adopt energy efficiency measures.

There is no significant difference between the mean motivation levels of those who intend to carry out other non-energy efficient home improvements and those who do not. This supports the earlier observation that those in the former group are no more likely to form an intention to take-up the recommendations for energy efficiency.

8.4.2 Motivation factors

The relative importance (in descending order) of each motivation factor, as perceived by the householders is shown in table 8-9. The questionnaire asked, 'Below are some reasons why you might want to adopt the energy efficiency measures recommended in the energy report. How important is each reason to you?', where 1 = not at all important and 5 = extremely important. On this scale a mean score of more than 3.0 can be interpreted as positive (i.e. important) and a mean score of less than 3.0 can be interpreted as negative (i.e. not important). All but one factor, 'to improve temperature for health reasons', has a mean score greater than 3.0, indicating that, as a group, the householders felt that all of the other factors were important motivating factors.

| Possible reason to adopt a measure | Mean Likert Score |
|--|-------------------|
| to reduce fuel bills/ reduce spending on fuel | 4.51 |
| to reduce waste/ keep the heat in | 4.34 |
| to reduce energy consumption | 4.12 |
| to increase comfort / make the house warmer | 3.99 |
| to replace or repair something that has to be dealt with anyway | 3.81 |
| to reduce impact on the environment | 3.71 |
| to increase convenience | 3.30 |
| other home improvement work is going on anyway so it is easy to do | 3.18 |
| a loan or grant is available to part-fund the work | 3.05 |
| to improve temperature for health reasons | 2.85 |

Table 8-9: Ranking of motivation factors according to mean Likert score

The literature review revealed a variety of motivation factors, which varied in relative importance from survey to survey. Despite the variety in survey design and specific target, certain motivation factors consistently appeared to be more important than others as perceived by the householders, namely: money and energy saving, comfort, keeping the heat in and reduced waste. This trend is reflected in the results of this research, with reduced fuel bills clearly being the most important motivating factor, followed by reducing waste, reducing energy consumption and increasing comfort. It is perhaps surprising then, that the measures most effective in achieving these goals are not the most popular according to results (see tables 8-1 and 8-2).

Probably the next most common reason to install energy efficiency measures, across all of the reviewed surveys, was the fact that something needed replacing anyway. This finding is again reflected in the results of the home energy report research, with 'to replace or repair something that has to be dealt with anyway' appearing below 'to increase comfort / make the house warmer' in the rankings table 8-9.

Almost everyone interviewed for the EST (BJM 1999) who had adopted energy efficiency measures stated convenience along with comfort and low fuels bills as a reason for their action. Convenience here referred to things such as ensuring that there was always enough hot water and that facilities were responsive and controllable and so on. However, few other surveys found this factor to be a high priority in the motivation stakes. This study, however, supports the EST findings.

Other much less popular factors explored and mentioned by respondents in previous surveys included the following: the fact that there was an associated grant, or the work was free or on offer; the measures added value to or simply improved the house; and environmental concerns. Very few people were primarily motivated by environmental concerns, though results suggest that it is considered by many to be a significant additional benefit. The research findings presented here identify 'to reduce impact on the environment' as being more important than 'to increase convenience', as well as 'other home improvement work is going on anyway so it is easy to do', 'a loan or grant is available to part-fund the work' and 'to improve temperature for health reasons'. This suggests that the homeowners surveyed here also consider reduced environmental impact to be a significant benefit of adopting energy efficiency measures. Whether or not this is a primary factor or additional is not clear.

'Other home improvement work is going on anyway so it is easy to do' appears to be relatively unimportant according to the householders. This result supports the finding

that there is no association between intended take-up of energy efficiency measures and the intention to carry out other (non-energy efficient) home improvements. Once again, this indicates that householders do not currently tend to think about how energy efficiency measures might be incorporated into their home improvements and it perhaps points to a lack of awareness about how to do this. The potential to make appropriate links has been identified (see 8.3.1).

'A loan or grant is available to part-fund the work', whilst being considered important overall, is perhaps surprisingly unpopular relative to the other stated motivation factors. This could perhaps be due to a sense that there are in fact few grants available to the householders in question and therefore it is unlikely to be a realistic motivating factor. Loans, on the other hand, *are* likely to be available to most homeowners, but it seems that this is not an attractive way to fund energy efficiency measures – or perhaps more realistically, energy efficiency measures are not an attractive reason to take out a loan.

'To improve temperature for health reasons' is the least popular of all the stated motivation factors. There has been little exploration of health as a motivation factor in the previous reviewed surveys. Hedges (1991) felt that health could potentially be a more powerful motivator, although at the time it was uncommon for respondents to bring up the issue in relation to energy conservation. Clearly health issues are not currently perceived to present a strong motivational force in encouraging adoption of energy efficiency measures. This might be explained in two ways: the first possibility is that this group, being relatively comfortable in financial terms, has not encountered health problems due to damp etc., since the dwellings in question are of relatively good condition, or else the occupants can afford to overcome potential problems through excessive use of heating; alternatively, it is possible that the general level of awareness about the link between dwelling conditions and health is very low among homeowners and thus health issues are not considered relevant.

The 'other' category was used by two respondents who wrote the following: 'to make the house look better' (stated once in relation to double-glazing) and 'to increase resale value'. It is possible that these factors would have gained a higher score, had it been stated in the questionnaire, however, it seems likely that they relate specifically to double-glazing rather than all energy efficiency measures in general, and hence it is suggested that homeowners do not generally think of energy efficiency measures as a means to increase the resale value of their home or to improve the appearance of the home. These factors will be explored further in chapter 10.

8.4.3 Barriers

The relative likelihood that each barrier would prevent adoption of energy efficiency measures (in descending order), as perceived by the householders, is shown in table 8-10.

| Possible reason not to adopt measure | Mean Likert Score |
|---|-------------------|
| I can't afford it | 3.20 |
| It will take too long to get the money back in reduced fuel bills | 3.09 |
| It will mean I can't afford other things (holidays, cars, clothes etc.) | 2.98 |
| I do not have the necessary DIY skills | 2.77 |
| I don't have enough reliable information on what to do | 2.69 |
| I have no time to do it/ organise it | 2.61 |
| It involves mess and hassle | 2.51 |
| I can't find a reliable installer/supplier | 2.50 |
| I'm not going to be living in house for long enough | 2.14 |
| I can't be bothered | 1.79 |

Table 8-10: Ranking of barriers according to mean Likert score

Whatever the householder's attitude towards domestic energy efficiency, it is not difficult to see how contextual (or situational) factors might remain barriers to positive action. The list of barriers in table 8-10 includes 9 items relating to contextual factors and 1 personal factor (I can't be bothered). Homeowners were asked 'how likely is it that each of [the stated barriers] will stop you adopting energy efficiency measures', where 1 = not at all likely and 5 = extremely likely. On this scale a mean score of more than 3.0 can be interpreted as positive (i.e. likely) and a mean score of less than 3.0 can be interpreted as negative (i.e. unlikely). Only the first two barriers in the table 8-10 have a positive mean score, inferring that all of the other barriers are perceived by the homeowner group (overall) as being unlikely to stop them from adopting energy efficiency measures. Based on previous findings, it seems unlikely that these results are a true reflection of the impact of external factors on action for domestic energy efficiency. This surprising result can perhaps be attributed to the fact that this research was introduced to the respondents from the outset as a 'research project into the energy efficiency of UK homes'. It is possible that this introduction might have the effect of encouraging respondents to want to be seen as having a positive attitude towards

energy efficiency. Alternatively, the respondents might simply be unaware of the true impact of external factors and hence they remain optimistic about turning their intentions into action.

Spending money is perceived by homeowners to be the greatest barrier to action. This is explained in two different ways: first, that the homeowner perceives that she/he cannot afford the financial outlay required for the measures; and second, that the payback time for the measures is too long. The next most important barrier (although the mean score was actually less than 3) also focuses on money, indicating that the homeowner's priorities for spending lie elsewhere, with things like holidays, cars and clothes coming first and hence leaving no funds for energy efficiency measures. The importance of this financial barrier is in part supported by the rank popularity of recommended measures. Although it has been noted that cost alone does not dictate popularity, two of the most expensive measures do prove to be the least popular. Double-glazing, however, remains an anomaly.

While spending money is clearly perceived as a barrier, *saving* money is perceived as the most important motivational factor. This situation justifies one of two explanations: either that the financial savings resulting from energy efficiency measures are not perceived to be great enough to justify the initial financial outlay; or that while householders perceive finance as the most important factor in their decision-making process, it is really only an *excuse* for inaction that results from other less apparent factors.

The first explanation suggests that people would be motivated to act if the financial savings were greater. Of course, financial savings increase with time, therefore, the longer one lives in a dwelling the more one will save. Perhaps then, in today's mobile society, the fact that people do not live in their homes for long periods prevents them from making the initial capital outlay on efficiency measures. However, this research suggests that owner-occupiers do not perceive this to be the case, as 'I'm not going to be living in house for long enough' is perceived to be one of the least important barriers. Perhaps then, it is the initial outlay- one large payment- that is not possible for people to afford and a loan or grant would be more attractive. However, this does not appear to be the case either, since 'a loan or grant is available to part-fund the work' is the least important motivation factor according to the respondents. While installing energy efficiency measures can save money, from the householder's point of view there are perhaps more obvious ways to achieve this goal- ways which perhaps

require less effort. This discussion suggests that there are external factors, other than finance, which exert a greater influence on this decision-making process.

No matter how informed the householder and how willing she/he is to take responsibility for 'the problem', practical barriers remain. Following the financial barriers, the barriers in descending order of importance, are: I do not have the necessary DIY skills; I don't have enough reliable information on what to do; I have no time to do it/ organise it; It involves mess and hassle; and I can't find a reliable installer/supplier. These barriers are unlikely to prevent the adoption of energy efficiency measures according to the householders' perceptions overall. However, it is still worth drawing inferences from the potential impact of these practical barriers, since any score greater than 1 indicates that there is a *possibility* that they could prevent action.

The first two barriers refer to a lack of skills and information, which prevent the householders themselves from taking action. Despite the clear recommendations for specific energy efficiency measures made in the home energy report, respondents are aware that a lack of detailed knowledge about how to proceed with putting these recommendations into action could possibly prevent action. Also important to consider is the element of time: it is inferred that a lack of time could possibly prevent action. Householders appear to either think it unlikely that they would be put-off by mess and hassle, or think that the recommended measures do not in fact involve much mess and hassle. Also, householders apparently feel reasonably confident that they could find a reliable installer or supplier. These kind of practical barriers will be explored further in chapters 9 and 10.

8.5 Underlying factors

Rather than attempting to draw inferences about the conceptual framework from the rank order of individual motivation factors and barriers³, the author felt that factor analysis would provide more robust findings. The objectives of this analysis are to:

- identify any underlying factors, which might influence the decision-making process of homeowners when considering the adoption of energy efficiency measures;

³ This qualitative analysis was carried out initially but it was felt that the inferences drawn by the author could be interpreted as tenuous.

- enable a comparison of underlying factors with the themes of the conceptual framework.

8.5.1 Motivation factors

| | Component | | |
|--|-------------|-------------|-------------|
| | 1 | 2 | 3 |
| to improve temperature for health reasons | 3.311E-02 | .759 | 9.174E-02 |
| to increase comfort / make the house warmer | .249 | .702 | 1.026E-02 |
| to reduce fuel bills/ reduce spending on fuel | .733 | .243 | -.105 |
| to reduce waste/ keep the heat in | .843 | .150 | 1.566E-02 |
| to increase convenience | 7.220E-02 | .691 | .342 |
| to replace or repair something that has to be dealt with anyway | 8.083E-02 | .146 | .704 |
| other home improvement work is going on anyway so it is easy to do | 1.342E-03 | .263 | .783 |
| to reduce impact on the environment | .715 | -9.022E-03 | .212 |
| to reduce energy consumption | .858 | 5.745E-02 | .110 |
| a loan or grant is available to part-fund the work | 6.507E-02 | -2.294E-02 | .594 |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 5 iterations

Table 8-11: Rotation matrix: motivation factors in adopting energy efficiency measures

Factor analysis of the 10 motivation factors resulted in the extraction of three components with Eigenvalues greater than 1. The first three components accounted for 60.0% of the total variance. The rotated component matrix is shown in table 8-11, with scores greater than 0.3 highlighted (or where more than one score for the variable is >0.3, the greatest score).

The first component includes the following: to reduce fuel bills/ reduce spending on fuel; to reduce waste/ keep the heat in; to reduce energy consumption; and to reduce impact on the environment. It is interesting that this component includes all of the factors that are concerned with reducing something. Previous surveys have found that money and energy are closely related in people's minds and this would seem to be supported by this result (BJM 1999). However, attitudes towards waste and environmental impact have not traditionally been associated with each other, or with the attitudes to saving money and energy. Indeed, attitudes towards waste are usually described as being dependent on age, a characteristic not necessarily shared with the other variables (Sadler and Hamlyn 1998; Cragg 1999).

Interpretation of this factor suggests that it is the attitude of the individual towards the broad concept of reduction that is affecting the scores on all of these variables. This is interpreted to reflect the theme of **efficacy**: making reductions in the various areas

represented, the householder is able to feel that she/he is making a difference, and exhibiting competence. High scores on this factor would therefore indicate a predisposition towards exhibiting efficacy. Scores obtained for factor 1 could, therefore, best be defined as 'efficacy'. High scores would indicate a greater tendency to be motivated to exhibit personal efficacy than lower scores.

The second component includes the following: to improve temperature for health reasons; to increase comfort / make the house warmer; and to increase convenience. This factor is concerned very much with the impact of the energy efficiency measures on the householders' quality of life standards. In an opposite fashion to the first component, all of the constituent variables are based on the idea of improving something or increasing something. Each variable offers a direct benefit to the individual and the household in the form of an improvement in quality of life. The literature has not previously directly associated health with the expected quality of life standards that result from adopted lifestyle. However, previous researchers have suggested that lifestyles are associated with, or even driven by, certain expectations with regard to standards of cleanliness or hygiene (Palmborg 1995; Shove 1995b). It is extremely likely that cleanliness and hygiene are associated with health in people's minds. This finding, supports this notion and suggests that there is potential to make links between health, quality of life and lifestyle. Hence, health might potentially motivate action on the same basis as comfort and convenience.

One might expect the variable 'to reduce fuel bills/ reduce spending on fuel' to also be included here. The fact that it is not suggests that financial gains, in this context, are not perceived to be associated with quality of life benefits. In summary, the second factor might, therefore, be defined as 'quality of life'. High scores on this factor would indicate greater concern for household quality of life standards than lower scores.

The third component includes: to replace or repair something that has to be dealt with anyway; a loan or grant is available to part-fund the work; and other home improvement work is going on anyway so it is easy to do. All of these variables are concerned with making the installation of energy efficiency measures easier to achieve. High scores would indicate a predisposition to recognise and take advantage of opportunities to adopt energy efficiency measures. This factor might be defined as 'opportunism'. High scores would indicate a greater likelihood that the individual would take advantage of opportunity than those with low scores.

8.5.2 Barriers

| | <i>Component</i> | | |
|---|------------------|-------------|-------------|
| | 1 | 2 | 3 |
| It will mean I can't afford other things (holidays, cars, clothes etc.) | .176 | .332 | .702 |
| I don't have enough reliable information on what to do | .726 | 5.530E-02 | .245 |
| I'm not going to be living in the house for long enough | 4.325E-03 | .641 | .230 |
| I can't afford it | .298 | 6.404E-02 | .779 |
| I have no time to do it/ organise it | .596 | .391 | 8.731E-02 |
| I do not have the necessary DIY skills | .697 | 8.796E-02 | .128 |
| I can't be bothered | .475 | .558 | -.414 |
| I can't find a reliable installer/supplier | .753 | 7.823E-02 | .116 |
| It will take too long to get the money back in reduced fuel bills | 4.263E-02 | .777 | .295 |
| It involves mess and hassle | .393 | .667 | -9.134E-02 |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 7 iterations.

Table 8-12: Rotation matrix: barriers to adopting energy efficiency measures

As with the motivation factors, factor analysis of the barriers resulted in the extraction of three underlying components with Eigenvalues greater than 1. The first three components accounted for 60% of the total variance. The rotated component matrix is shown in table 8-12 (with high loadings highlighted).

Component 1 includes: I don't have enough reliable information on what to do; I have no time to do it/ organise it; I do not have the necessary DIY skills; and I can't find a reliable installer/supplier. These variables are all concerned with the immediate practical constraints on following the procedures associated with adoption of energy efficiency measures. Each constraint could be alleviated through the provision of procedural information. This factor could be defined as '**procedural constraint**'. High scores would indicate a greater likelihood that procedural constraints would prevent adoption of energy efficiency measures than low scores.

Component 2 includes: I'm not going to be living in the house for long enough; I can't be bothered; It will take too long to get the money back in reduced fuel bills; and It involves mess and hassle. These variables represent the perceived personal costs of engaging in energy efficient home improvements: being out of pocket financially; having to use some personal effort; and being disrupted. Offering procedural information to people who face these barriers would be unlikely to overcome perceived personal costs. However, these problems *could* be overcome if the homeowners

perceived the benefits of energy efficient home improvement as being great enough to outweigh the costs. Whether or not a barrier actually exists is not the issue here; what is important is the householder's perception. This factor might best be labelled as 'personal cost' (c.f. personal gain). High scores on this factor would indicate an individual with a greater tendency to perceive personal costs than an individual with a lower score. It is inferred that this is a result of a lack of perceived value in adopting energy efficiency measures.

Component 3 includes: it will mean I can't afford other things (holidays, cars, clothes etc.); and I can't afford it. This factor is clearly concerned with **affordability**. High scores would indicate a lack of funds to carry out energy efficient home improvement. However, it is noted that 59% of the households represented in this study had an income greater than £30,000, thus, high scores could perhaps reflect householders' financial priorities rather than actual ability to pay for improvements. In this case, if householders decided that energy efficiency measures were a priority then they would be able to afford them by adjusting their spending habits – while they are not a priority their money will be spent on things that are perceived to be more important. Spending *habit* would, therefore, be an important sub-factor within this third component: 'affordability'. This sub factor suggests one way in which self-interest can work against the goal of energy efficiency.

8.5.3 Implications for the conceptual framework

| Factor | Variables with high loadings on the factor |
|-----------------------|---|
| Efficacy | To reduce fuel bills/ reduce spending on fuel To reduce waste/ keep the heat in To reduce impact on the environment To reduce energy consumption |
| Quality of life | To improve temperature for health reasons To increase comfort / make the house warmer To increase convenience |
| Opportunism | Other home improvement work is going on anyway so it is easy to do To replace or repair something that has to be dealt with anyway A loan or grant is available to part-fund the work |
| Procedural constraint | I don't have enough reliable information on what to do I have no time to do it/ organise it I do not have the necessary DIY skills I can't find a reliable installer/supplier |
| Personal cost | I'm not going to be living in the house for long enough It will take too long to get the money back in reduced fuel bills I can't be bothered It involves mess and hassle |
| Affordability | It will mean I can't afford other things (holidays, cars, clothes etc.) I can't afford it |

Table 8-13: Summary of factors

This exploratory factor analysis has identified six underlying factors which influence the intention of homeowners to adopt energy efficiency measures. Table 8-13 shows a summary of the factors, as interpreted by the author (and thus labelled) and the variables that weight significantly on each. These factors present a framework for understanding the decision-making processes of homeowners, thus bringing an alternative perspective to the problem of engaging owner-occupiers in energy efficient home improvement.

The factors identified underlie the intended rate of take-up and relative popularity of the measures as shown in table 8-1; they are, therefore pertinent to the effective design of the home energy report. It is acknowledged that this analysis cannot reveal the strength and direction in which the identified factors affect the homeowners' decision-making. However, these factors have been shown to influence homeowners; they are the drivers behind their thinking and hence they indicate the broad *issues* that need to be addressed if providers (through the home energy report) are to influence homeowner intentions. These issues reflect the themes of the conceptual framework and thus support this framework in a number of ways.

First, the notion that intrinsic satisfaction, resulting from pursuing self-interested needs (for competence, making a difference and forging a better life), can potentially influence the intention to engage in energy efficient home improvement. This is reflected in the factors 'efficacy' and 'procedural constraint'. While the first factor has been labelled 'efficacy', all of the constituent variables, other than 'to reduce impact on the environment' can be interpreted to relate to the theme of **frugality**. While DeYoung (2000) found frugality was separate from other competence-related factors, this finding suggests that the underlying motivation for competence and making a difference might drive attempts to be frugal in the same way that it drives attempts to reduce impact on the environment. Also worthy of note is the fact that 'to reduce fuel bills/ reduce spending on fuel' is included within this factor. This suggests that efforts to reduce fuel bills are perceived to be a means to exhibit competence and make a difference, rather than a means to achieve personal ('selfish') gain, as might have been supposed. This finding offers an explanation for the apparently contradictory result that, on the one hand, the respondents in this study perceived themselves to be most powerfully motivated to engage in EEHI as a desire to reduce fuel bills and yet, on the other, they perceived affordability to be the primary barrier to action: the factors underlying the responses to these two variables appear to differ (see 'affordability' below).

Second, supporting the 'selfish' conceptualisation of self-interest is the factor 'personal cost'. It is interesting that 'affordability' emerges as having an influence on the process that is different to that of 'personal cost'. This suggests that affordability should be considered to be a separate factor, being conceptualised as something other than a personal cost by the everyday householder. The observation that affordability might more accurately reflect spending priority and habit does, however, infer that this factor remains associated with self-interest⁴.

Third is the idea that lifestyle and associated standards of comfort, convenience and health can also influence the intention to act. The inclusion of health within this factor suggests that the potential to motivate EEHI on health grounds lies in framing health as another life-style associated, **quality of life** standard. Fourth, the factor 'opportunism' clearly reflects the theme of the same name, offering a means to facilitate the effective use of human cognitive capacity, for example, by offering information and advice at a time when the individual is considering relevant action or by offering an incentive.

In order to increase the motivational power of the home energy report, and thus increase effectiveness, the report should address all six issues through appropriate design. It is suggested that communication of the concepts embodied in each factor, alongside more detailed and **specific** information relating to these concepts, might potentially increase the effectiveness of the report. It should be noted that the factors that have emerged are necessarily limited by the items chosen for the motivation factor and barrier lists in the questionnaire. The researcher does not therefore claim that these are the only underlying factors influencing the householders' intentions: this is supported by the fact that only a relatively small proportion of the variation in intended take-up could be predicted from the motivation level which was based on these factors (see 8.4.1). Preliminary examination of the rank popularity of measures suggests that **familiarity and opportunity for participation** might also affect the decision-making process (8.2.3). These and other factors will be further explored in chapters 9 and 10.

8.6 Summary

There is evidence to suggest that the HER is effective in engaging some householders in EEHI. However, it appears to be most effective in motivating low-cost measures that are relatively ineffective in terms of absolute energy efficiency levels. The exception is loft/roof insulation which is relatively popular. The findings raise the question as to

⁴ If this factor is taken at face value i.e. an ability or inability to afford the measures (rather than a perception or an inclination on the part of the householder, as the author is inferring here) it might also be categorised as an external constraint - an area beyond the scope of this study.

whether or not the adopted measures might have been installed regardless of the HER advice.

Interpretation of the results using the proposed 'everyday householder approach to programme design' as a critical framework has so far rendered support for the following conceptual framework themes: procedures; efficacy; quality of life; opportunism; familiarity; participation; and visibility. In addition it has been suggested that the theme frugality should be incorporated within efficacy and that personal gain should incorporate the negative dimension, personal cost. There is evidence of potential to integrate energy efficiency measures into mainstream home improvements that householders are already willing to engage in, thus reducing perceived personal costs. It is suggested that this might be achieved by making appropriate links in the HER.

The following chapter will explore in more depth what happens after the intention to adopt recommendations has been made, in order to identify further factors influencing the decision-making process. This time the factors associated with specific measures will be identified. These might in turn offer further support for the conceptual framework.

8.7 References

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9. The householder experience of energy efficient home improvement (EEHI)

9.1 Chapter outline

This chapter presents the second set of findings resulting from phase 3 of the empirical research - the 21 follow-up interviews. The householders' experiences of pursuing individual energy efficient home improvements and the reasons why some intentions had not been fulfilled are explored in more detail. Also explored is the perceived impact of the improvements on the value of the home and on everyday life. The circumstances that might motivate householders to adopt the recommended measures are described from their own perspective, as are the ways in which the home could be improved in order to improve the quality of life or health of the occupants. Finally, the implications of the findings are discussed with reference to the themes of the conceptual framework.

9.2 Introduction

While motivation factors and barriers to EEHI have been explored in chapter 8, these methods relied on the predefinition of concepts from the perspective of the researcher and on the researcher's interpretation of the popularity rankings of the various measures. These methods are entirely valid, however, the follow-up interviews presented an opportunity to pose open questions and thus permit the concerns of the householder to be presented alongside those of the researcher. In this way, issues that might not have been raised within the constraints of the researcher's perspective might be allowed to emerge. The interview format permitted exploration of those factors relevant to each individual measure (see appendix D, 16.1). The themes pertinent to each measure are therefore discussed before turning to more general themes.

Following broad questions relating to the householders' experiences of pursuing individual EEHIs, the researcher asked the 21 interviewees directly about some additional factors that might potentially play a role in motivating EEHI. First she explored the potential of the measures to improve the value of the home. Then she sought to identify the more 'visible' benefits associated with EEHI as perceived by the householders, asking about the impact of the measures on the experience of the home. These benefits were viewed as a potential means to engage householders in action. Asking the householders what circumstances might motivate the take-up of recommended EEHIs was again intended to identify potential means of engagement.

This time the householders were encouraged to think of the problem from a new perspective and to identify the primary barriers to action.

Finally, the researcher explored the potential to make links between EEHI and quality of life and also health, asking the open question: Are there any other ways that you think you could improve your home to improve your quality of life or even your health? This exploration was based on the suggestion drawn from the literature that concern for quality of life (and health as part of this concept) is potentially highly motivating in the context of householder consumption. Through qualitative analysis, the researcher has looked for further support for the themes already identified in chapter 8, but has also attempted to represent the views of the householder and find further support for the conceptual framework.

9.3 The householder experience in pursuing EEHI

9.3.1 Energy saving light bulbs

When asked what energy efficient home improvements had been made, the interviewees often forgot to mention energy saving light bulbs until prompted. Once reminded, many people were very enthusiastic about this measure, a typical comment being:

'...we're big fans of energy saving light bulbs' (#253)

The fact the householders did not immediately think of these measures in the context of energy efficiency supports the proposal made in chapter 8 that they are considered to be relatively mainstream rather than specialised energy products. Many different factors appealed to the homeowners about the bulbs, as well as '...energy saving, money-saving, ecology...' (#253), people mentioned the fact that they last longer, reliability, reducing costs in particular circumstances where there is a need to keep the light on for long periods (for example on the landing for children, having lights on while away), the notion of getting more light for the same energy. These sort of 'added-value' issues appear to be more important to some homeowners than the energy saving potential:

'...so we changed to the energy saving ones which obviously use up much less electricity and also more importantly seem to last an awful lot longer.' (#141)

One person (#155) even preferred their quality of light, which is something that has been previously cited as a barrier to their adoption in some countries (Wilhite, Nakagami et al. 1995). While there was no evidence that the **visibility** of the bulbs themselves made them more desirable, it was clear that the 'added-value' benefits were highly 'visible' to the householders, having a perceived impact on everyday life. Fans of the bulbs appear to be driven by a desire for particular standards of convenience and comfort, which it has been suggested are integral to one's quality of life.

The **procedures** for obtaining the light-bulbs and fitting them DIY were perceived to be straight-forward and were clearly **familiar** to the householders. One person, although he had bought the early versions of the bulbs, appeared to be far happier with the now lower price and improved selection. There were, however, still a few comments which showed that the bulbs did not always fit the lamp fitting or the shade size, even now. The relatively high price of the bulbs was mentioned; this person illustrating succinctly that it was a matter of priorities:

'Oh I know but they're about £11 aren't they? You see the literature on them and you think ... they're going to save you a fortune here. And then you look at the price and think hmmm. There's always something else you can buy for £11.'

(#113)

There was mention of some problems with the bulbs as they came to the end of their lives (reduced light output and becoming unpredictable), however, this did not put off the person in question buying more bulbs.

9.3.2 Double-glazing

Chapter 8 suggested that the popularity of double-glazing might be explained by its visibility. However, it was acknowledged that this did not on its own account for popularity, since other relatively visible measures were not particularly popular. The follow-up interviews revealed the most popular reasons for installing double-glazing to be: perceived low maintenance during the windows' lifetimes; energy efficiency/fuel and financial savings; reduced heat loss or warmth/comfort; and reduced sound levels (from the exterior). Also mentioned were: to look better; environmental issues; security; removing condensation; lack of painting required (with upvc or pre-treated timber); and no draughts. It appears that the 'added-value' issues are just as important, if not more important motivators than the energy efficiency potential of this measure.

This array of motivating factors, drawn from just four different homeowners, reveals the range of levels upon which the double-glazing can potentially appeal. It is suggested that it might be for this very reason that double-glazing is so popular: in addition to the double-glazing itself being highly visible, the diverse benefits of the measure are highly 'visible' to the householder. Among these benefits are many that have a positive impact on everyday quality of life; some of which relate to convenience and levels of comfort.

The procedures involved in having doubleglazing installed were considered straightforward, with a range of suppliers or installers available. This supports the proposal in chapter 8 that the familiarity of the measure, due to its mainstream pro-active marketing, might also contribute to its popularity. There was also a general high level of knowledge about doubleglazing among those who had adopted the measure. Two people mentioned k glass and another mentioned the increased air gap, which offers a better energy efficiency. The latter person (#98) - clearly familiar with the double-glazing options available to him - had previously elected to have the windows made, then fitted by a builder. However, this he felt had been 'a lot of hassle' and he didn't think he had saved much money. Therefore, this time he had elected to go with a double-glazing company for both manufacture and fitting. He did not, however, trust the company to finish the job '...to match the character and style of the house...' This concern reflects the importance of the appearance of the double-glazed windows and their visual impact on the home as a whole. Despite the fact that (perceived) improved appearance of the windows was not mentioned by anyone without prompting, it is suggested that this does, in fact, remain an important underlying motivating factor.

On the other hand, the appearance of new double-glazed windows, and their inability to be 'in-keeping' with the home can become a barrier to adoption in the case of older homes (#263). It is clear that for some, upvc is synonymous double-glazing – upvc being seen as distasteful and double-glazing, therefore, being associated with this distaste. This perception might itself act as a barrier to the adoption of double-glazing by certain groups of people.

9.3.3 Loft insulation

Most of the recommendations for loft insulation appear to have been for top-up rather than full insulation. For this reason, many people appear to have presumed that either it did not need doing or that it was not a priority in energy efficiency terms. A number of people, for example, when asked if they had installed the measure, simply said that it

was already there, only acknowledging the possible need for top-up after prompting. Others simply felt that what was there was okay. One householder even consulted his lawyer about the recommendation and concluded:

'I think the surveyor was just going the full whack and saying, if you want to make your house perfect. And I mean I can't overly afford that at present. I am quite happy.' (#152)

However, loft insulation was identified in chapter 8 as one of the more popular 'high gain' measures in terms of the increased energy efficiency it affords. It was suggested that the DIY nature of the measure might play a role in its popularity. The follow-up interviews resulted in a general sense that loft insulation and the associated installation procedures were indeed familiar to householders and there was recognition of opportunities to integrate the measure into other improvements. Two people planned to 'board the loft out' and install insulation at the same time and another was considering a loft conversion, recognising the opportunity to increase the insulation in the eaves and 'roof lining' (#1). One person would be re-using some excess insulation from another part of the dwelling (#51). Another intended to install the insulation once financial circumstances allowed.

Already having living space in the loft was seen as a barrier to improving the insulation in one case, presumably because the procedures involved in roof insulation would be far more complex than for loft insulation. This householder did acknowledge, however: 'it doesn't feel that warm up there.' (#117)

9.3.4 Thermostatic radiator valves

Chapter 8 identified thermostatic radiator valve (trvs) as one of the few measure types to have actually been adopted. Those who favoured trvs mentioned the attractions of money saving and good control. It is suggested that the attraction of good control lies in the standards of convenience and the comfort that become achievable; in other words the potential **quality of life** standards. One person thought he would make the most of the opportunity presented by the need to drain the radiators for another purpose and install trvs at this time. Another had bought the measures, but had not got around to installing them. Clearly these people saw trvs as a DIY measure.

Having intended to install the trvs, one person had not, in the end, found a necessity for them. He was content instead to simply turn radiators off in rooms where they were not

always required. Another felt that £20 for a valve simply didn't seem worth it. These kind of sentiments are reflected here:

'I was sceptical about how much benefit I would actually get and controllability from thermostatic valves. I think you get reasonable control with the conventional valves. It obviously just means you have to balance them a bit more. But yes, again it's certainly something we would consider – it all depends on price ultimately. I think the thermostatic ones are maybe three of four times the standard ones.' (#250)

There appears to be a sense among some that trvs don't really offer a great deal of additional benefit when compared to standard valves. The problem perhaps lies in the fact that, for some, these measures are not perceived to have a tangible positive effect on everyday life. However, others have clearly accepted their reported benefits.

9.3.5 Cavity wall insulation

The results presented in chapter 8 suggested that particular barriers existed to the adoption of cavity wall insulation. Only one person had pursued cavity wall insulation. He had not yet had it installed, however, it was clear that this was imminent as he was taking advantage of a discount offer from a utility company. This householder (#98) was relatively informed about domestic energy efficiency measures in general and he had insisted on the use of a specific insulation product (Rockwool) because he was familiar with it and because it is 'a natural based product totally resistant to water'. The installation had been motivated by a general interest in energy saving and 'reducing the running costs of quite a large house.'

On investigating further what the particular barriers to adoption of cavity wall insulation might be, it was discovered that four people still intended to install the measure – a higher rate of take-up than the recorded 'intended' rate from phase 2. They could in fact see the advantages, especially one person who had had experience of the measure:

'I think initially the former house that I had was very very efficient to run ... I had cavity wall insulation and it's unbelievably cheap to run. It's cheaper than my first house which was like a little two bedroomed terraced house.' (#1)

The latter person talked of it being 'more a matter of doing it as time progresses.' Another had looked into the measure and found it would cost over £1000 which was not currently affordable. Another intended to carry it out but felt it was not currently a priority. For these people there appeared to be no barrier to adoption that was specifically associated with this measure; only time and money.

Another person acknowledged the benefit of cavity wall insulation, however, he also felt as if the house was '... okay to be honest, without that' (#17). This is possibly a function of the **invisibility** of the measure and the invisibility of heat loss through the walls (as compared with, for example, draughts around windows). The apparent solidity of the walls effectively masks the heat transfer from one's perception and hence one perceives no immediate need to take action.

Four people who had had the measure recommended thought that their walls had already been insulated (one being a relatively new dwelling). Another had apparently had cavity wall insulation recommended for a solid-walled Arts and Crafts house. This kind of mistake clearly calls into question the credibility of all information in the HER.

There were only two direct mentions of potential barriers unique to this measure – both relating to installation **procedures** (#113):

'My parents actually had that done and it wasn't very successful. But having said that it was a fair few years ago. Maybe the techniques have improved so you can get more dense packing of the polystyrene granules or whatever.' (#141)

This kind of experience can potentially do a great deal of damage to the image of specific measures and might even put people off pursuing other types of measures. Although the latter points to a need to focus on and proactively improve the image of cavity wall insulation, these results suggest that for most people the barriers to its adoption are those shared with many other energy efficiency measures; namely, cost, **personal costs** such as time and effort and the **invisibility** of its benefits.

9.3.6 Boilers/ Heating system

The results presented in chapter 8 suggested that particular barriers existed to the adoption of the condensing boiler. Although no one had installed this measure, one person was in the process of getting quotes following a local district council recommendation (#250). It was suggested in chapter 8 that high cost might play a role

in the measure's relative unpopularity and in the follow-up interviews four people specifically cited expense as a barrier (**affordability**). There were, however, other factors involved. For example, one householder had been specifically put-off the condensing boiler by a plumber friend who didn't 'rate them particularly' and advised that the spares were 'exceedingly expensive' (#155). Examples such as this provide evidence of the effectiveness of the **humanised** message that is delivered via social networks by a known individual.

Another combi boiler had been installed (despite no related recommendation or energy advice) and another 'far more efficient', fan assisted type was planned. One householder who had had the condensing boiler recommended was planning instead to improve the efficiency of the existing system using controls etc. These improvements appealed to him because:

'...it's a case of 'A', much more efficient use of the energy that I'm using and 'B', the speed that we can heat the various zones.' (#98)

This comment reflects a desire for a more controllable system that offers convenience (**luxury**), in the same way that the trvs appealed to some. Most other people who had been recommended a condensing boiler had not seriously considered it primarily because they felt that their boiler was okay and wouldn't need replacing for a while. While one person said that he would replace his boiler when necessary with a condensing boiler, it was generally apparent that most householders were aware of the opportunity to replace their boiler with another more efficient type, but they were unconvinced or unaware that the condensing boiler would offer benefits sufficient to outweigh the extra cost.

9.3.7 Draught-proofing

Chapter 8 also suggested that there were particular barriers to the take-up of draught-proofing, since it remained relatively unpopular despite being a low-cost and effective DIY measure. The person who *had* engaged in draught-proofing had tackled the front door to stop draughts. Two others still intended to draught-proof; one of them actually replacing the front door to achieve this, but seeing this 'as much of a security as a draught exclusion exercise' (#98). The other person was motivated to save money and keep the house warm (#117) (**personal gain / quality of life**).

Having intended to install the measure, another householder felt, since moving in, that it was actually okay and so he would not do it at the moment (#250). Another felt that double-glazing rendered draught-proofing unnecessary. Also a factor in one case was the desire to retain the character of the dwelling:

'... they were original features so you're not really going to mess about with them.' (#263)

These responses point to two potential reasons why draught-proofing is less popular than might be expected. First, the benefits are not perceived to be great enough to justify installation – things seem to be alright without it. Second, the draught-proofing is itself thought of as a way to 'mess about' with, rather than improve what is already there. It is therefore not perceived as a home improvement, rendering it less attractive. Finally, the fact that one householder still intended to draught-proof suggests that there is also simply an element of 'getting round to it', shared with many other of the measures.

9.3.8 Hot water tank insulation

The two people who had been recommended hot water tank insulation found that there was already some insulation in place. Both householders (#118; #52) acknowledged that this needed upgrading, but it was a case of not having done it yet. No further explanation was given for the apparent unpopularity of the measure in terms of actual take-up, given the popularity one would have expected from the intended rate of take-up (see chapter 8). It is suggested that the fact that there is something in place already acts as a barrier to further action, as the measure is then perceived to be less urgent. This is supported by the similar finding that none of the householders who already had some loft insulation had got around to topping this up.

9.3.9 Solid wall insulation

An examination of the relative popularity of recommended measures in chapter 8 suggested that the cost of solid wall insulation might be a factor in its unpopularity. Three people in the follow-up interviews in fact cited the cost/financial constraint as the only thing putting them off installing solid wall insulation (**affordability**). There was, however, also some uncertainty about what form exactly this measure took (#1):

'...solid wall insulation – I've spoken to several people and they're not really sure what that is. It's not one of the more common ones is it solid wall insulation?' (#155)

This comment suggests that solid wall insulation and the associated **procedures** are relatively **unfamiliar** to the everyday householder: this could potentially play a role in its unpopularity.

9.3.10 Pipe insulation

Just one person had had pipe insulation recommended. He felt that the only thing that had put him off doing it was 'the hassle of getting round to doing it.' (#113) It has been suggested that DIY measures might be relatively popular due to the opportunity for participation that they present to the householder. However, this response points to the potential drawback of DIY measures; they involve personal time and effort and hence the **personal costs** might potentially be perceived to be greater than for those measures installed professionally.

9.3.11 General themes

In explaining why some measures had and had not been installed some general themes emerged strongly that were not related to specific measures. In support of the results in chapter 8 (8.4) relating to barriers to EEHI, cost (or **ability to afford**) was most commonly mentioned. Another homeowner also added the time factor, but went on to infer that it is also a matter a of personal priorities:

'I mean there are other things that are slightly more urgent for us, but it's the sort of thing we'll get round to yes.' (#52)

There were signs that some homeowners were making the most of the opportunity presented by general home refurbishment works. One homeowner was awaiting planning permission for an extension and intended to incorporate energy efficiency measures at this time to reduce overall disruption (#151). Similarly, another had 'gutted' his home and completely refurbished it using the services of an architect. Energy efficiency measures had not been something that he had specifically aimed to include, however, the refurbishment had included extra roof insulation, a new energy efficient boiler and double-glazing in a glass extension:

'...I didn't say I wanted an energy efficient boiler - I wanted a new boiler and it was energy efficient boiler and the roof lagging that was just part of the specification that we asked the contractor for.' (#226)

Despite an apparent lack of interest in energy efficiency, this homeowner did hope that the work would result in lower fuel bills and he felt that the HER had served a purpose:

'...I also had my own survey done, so probably a lot of those would have come up anyway, but I guess the energy report sort of flagged them up, up front...I think it probably did raise my awareness, because with so many other things to think about energy was not very high on my list of priorities.' (#226)

This quote highlights the fact that the time of moving home and making home improvements is an extremely busy time, when many different areas are competing for attention from the homeowner. Once again this highlights the fact that in some senses the HER is not **opportunistic**. The report could potentially lose the competition and simply fail to gain the attention of the homeowner among all of the other items of information delivered at this time. On the other hand, as this homeowner seems to suggest, the energy report could serve the purpose of at least raising the homeowner's awareness, possibly serving as an aide memoire at a later (less busy) date.

There was a general sense among many people that the energy efficiency improvements they had installed, or intended to install, would offer fuel savings and reduced bills, even where these measures were relatively ineffective in this context (e.g. double glazing and energy saving light bulbs - #250). This perhaps suggests that for some people it is not necessarily the absolute level of financial saving that motivates energy efficient home improvement, but rather the broad notion that some kind of saving, or attempt to save, is being made. This supports the finding in phase 2 (see section 8.5) in which an underlying motivation for **efficacy** (exhibiting competence and making a difference) was identified as the driver behind reducing fuel bills, or spending on fuel.

One respondent highlights the existing potential for different attitudes towards home improvement depending on the lifecycle to which the property is aligned:

'...it's a different kind of property to the last one, so it will be more long-term work.'
' (#1)

This householder is planning to stay in his home with his family for a reasonably long duration. He recognises the difference between this situation and the last – perhaps a 'starter home' - and appears to be more likely to invest in this home than the last, on the basis that he will benefit from his improvements. Whereas any investment in the starter home might have been short-term only, he appears to see improvement in this long-term home as an on-going process. This observation has further implications for the **opportunism** of the energy report, suggesting that the opportunistic timing of energy advice might differ for different lifecycles. In particular, those planning to stay and make investments over a longer period might need a **follow-up** advice service.

Finally, an unusual situation was revealed in one household in which the interviewee owned her home, but was not responsible for the maintenance; this was carried out by the Housing Association from whom she had bought the home (#33). This kind of situation, while it could present a barrier to energy efficient home improvement, also presents a great opportunity to introduce a service culture to support domestic energy efficiency.

9.3.12 Would the measures improve the value of the home?

Most people thought that the energy efficiency measures they had installed would not improve the value of the home. Five people, however, mentioned that they did think double-glazing would have a positive impact. In each of the following cases, one person mentioned that they thought the value would be improved by the measure: cavity wall insulation, thermostatic radiator valves, loft insulation, energy saving light bulbs, conservatory, new boiler, central heating. Those householders who had conceived EEHI as part of their wider efforts to refurbish and improve their homes did feel this type of measure would improve a home's value, or at least its 'saleability':

'I think everything is a combined thing that puts value on the house as a continuous – as you improve things it just looks aesthetically better and if you were going to move I would leave all the light bulbs in there, so somebody might look and go, oh yeah, it's not going to be expensive to run, it's got - yes I suppose it would do.' (#35)

Despite the fact that the measures referred to were in this case only energy saving light bulbs and draught proofing, if they can be part of a general effort to improve the aesthetic experience, then they could be valued by viewers. This value rests on the

visibility of the measures themselves. The notion of visual impact being valuable is reinforced by a few other respondents:

'It doesn't seem it to me, no, I don't think buyers - they would be more interested as to whether there was wallpaper or painting than whether there was foam filling or not.' (#230)

'I don't think there's as much awareness of cavity wall insulation because it doesn't give you a visual impact.' (#98)

The **invisibility** of many measures does, therefore, appear to present a barrier to popularity. However, the latter respondent did feel that the reduced running costs and manageability (c.f. convenience), resulting from energy efficiency improvements, could improve value in the case of larger houses that tend to be expensive to run.

Energy efficiency improvements were also associated with the notion of making the home 'up to date' and 'brand new' (#152)– features which were perceived to potentially improve value. These ideas support the conceptual framework theme '**luxury**' which is described as offering satisfaction, gained from having both the conveniences of our modern society and access to new and novel products (De Young 2000:520 - see section 5.3).

Finally, one homeowner had produced fuel bills for prospective buyers to look at in the sale of his last two homes. His experience was that there was interest among those interested in the starter home, but no interest among those interested in the more expensive home:

'Everybody asked me about Council tax, but nobody asked [about energy bills], even when I prompted them and said look we've done all this work and this is the upshot of it. People weren't that interested really.' (#1)

In his experience it appeared that relatively wealthy households perceived the **personal cost** of heating a home to be less than a low-income household might. Other types of personal outcomes become more important than the personal financial cost once income increases.

9.3.13 Perceived impact on quality of life and health

A number of questions were asked with the intention of exploring what the householders perceived to be the impact of EEHI on their everyday lives. The interviewer was particularly interested in whether or not the householder would perceive any quality of life or health benefits. As noted at above, some specific measures were linked to increased standards of comfort (e.g. draught-proofing and double-glazing) and convenience (e.g. energy saving light bulbs and trvs). Double-glazing was also linked to improved appearance and security, reduced condensation and sound levels and it was specifically cited as a potential means to improve quality of life (#1, #155). However, when addressing specific measures, there was generally a greater emphasis on the resulting energy and financial savings than on the resulting experience of the home.

For those who saw EEHIs as part of a wider effort to make the home 'your own', energy efficiency *did* more commonly become associated with an improved home experience:

'Does your home feel better to be in in anyway?' (interviewer)

'I hope so. Just because you make it your own don't you? You decorate it to how you want it. To your standards really. So the bits we're replacing we're bringing up-to-date with modern technology and fuel savings obviously.' (#250)

There appears to be an association here between **quality of life** standards and energy efficiency and also between a sense of **luxury** derived from modern technology and energy efficiency. This type of association also occurred where energy efficiency was part of other major refurbishment/extension works which were themselves perceived to improve the home experience.

The least visible of the installed measures, such as loft and wall insulation, were not mentioned by the householders as having an impact on everyday experience of the home. This is despite the fact that these measures represent some of the most effective in terms of increased comfort. However, when asked if they thought there were any *other* ways they could improve their home to improve quality of life or even health, two people mentioned insulation. More commonly the householders would propose decoration, associating this with making the home 'warmer' (and hence making the inhabitants feel 'cosier' and happier - #35), or 'light and bright' (#51).

General change to make things 'more in line with your personal taste' was also associated with comfort, which was in turn associated with quality of life (#141).

Increased space was a relatively common response, representing a better quality of life for a number of homeowners. An extension and a conservatory were specifically mentioned – the appeal for one homeowner lying in the increased light afforded by an open plan arrangement (#160). A few other one-off suggestions were made, including garden landscaping for improved amenity. Solar power also emerged in this context. However, when asked what appealed about this measure, the response did not appear to link directly to quality of life:

'I just think that it's environmentally more friendly and hopefully cheaper as well at the end of the day.' (#52)

Perhaps this suggests a cognitive link for this person, between 'environmentally friendly' and quality of life. If this is the case, there could be a great potential to market energy efficiency products within this framework. It is perhaps the notion of a 'green' self-identity, or the ability to make a difference, that form the underlying motivating factors here. There was also apparently an association for one householder between increased quality of life and security, as he spoke of his new high spec. alarm system in this context.

There were no direct references to health issues until the householders were specifically asked about this issue. Even then few people made links between improved health and energy efficiency. Two people mentioned asthma problems in the household, one suggesting that the replacement of a carpet would help and the other inferring that the central heating that he planned to install would eliminate the cold and damper conditions that can be problematic. Another householder appeared to have a general sense that energy efficiency was linked to his child's future well-being:

'I would certainly incorporate more energy efficient systems if there were things available that I thought I could improve, you know, environmental [sic] is a very important issue, with a daughter of five, it's her future well-being.' (#250)

There was reference to the health implications of plastics and MDF, and a suggestion that natural wood is preferable to having lots of these materials in the home environment (#253). One homeowner, although he could not think of any other ways to improve the home for health reasons, had chosen his current home location (away

from cables and transmitters and near the coast) because he thought it was 'less hazardous to health' (#98).

The results suggest that few people directly associate energy efficiency measures with quality of life or health benefits - double-glazing providing the common exception. In general, the '**visibility**' of an energy efficiency measure's benefits appears to rely on the visibility of the measure itself. There is a sense that if you can see it, then you can experience its effects. If, on the other hand, the measure is doing its work out of sight, you simply hope or have faith that it is making a difference to your bills at the end of each quarter. The responses highlight the other types of home improvements that householders consider to improve quality of life and health and it is again suggested that energy efficiency measures might be integrated into these improvements. In addition, it has emerged that householders are attracted by the idea of making the home warmer, cosier and also light and bright. It is suggested that energy efficiency measures might be marketed as a means to achieve such qualities rather than simply relying on fuel savings and reduced environmental impact to motivate action.

9.3.14 Further motivating circumstances

Where householders had no imminent intention to install the energy efficiency measures that had been recommended to them, the interviewer asked questions such as: 'In what circumstances might you install these measures?' and 'what would encourage you to install them?' The most common response related to money, for example, 'funds permitting' (#51), or 'a grant' (#98), or 'if they gave them me free.' (#17). This again supports the finding in chapter 8 that **affordability** is perceived to be the greatest barrier to take-up. 'Having the time' (#52) was also mentioned, particularly relating to the less expensive measures, with one householder emphasising the importance of both time and the financial factor for everyone— even those who are positive about domestic energy efficiency:

'I'm already sold on the idea of all that stuff, it's just getting round to doing it and the cost.' (#113)

On further probing it was clear that time and cost had to be balanced:

'Okay. So how could anybody encourage you to get round to doing it?

(Interviewer)

If they did it for me.

So if somebody came round and offered to do it for a good price, would that make it more attractive? (Interviewer)

No. If somebody came round and said it was free, then I'd get it done yeah. Price wise. I'd rather do that sort of thing myself.

Why's that? (Interviewer)

Well it's pretty straightforward isn't it? I don't know about the cavity wall insulation, that sounds quite complicated, but pipe insulation and energy saving bulbs, it's straightforward, it's just getting round to doing it.' (#113)

'Just getting round to it' has arisen a number of times in reporting these findings and will be an extremely important concept for energy programme providers to unravel. An examination of the factors influencing take-up of each individual measure has begun to suggest that this might be a complex concept representing a variety of factors. These constituent factors also appear to depend on the particular measure itself. 'I can't be bothered' was identified in chapter 8 as unlikely to prevent take-up of recommended measures by the householders. This suggests that the householders do not equate 'not getting round to it' with 'can't be bothered'. Instead there are justifiable reasons for not getting round to it, such as a lack of time and money.

Money was described as 'the great mover in life' (#263) and it was suggested that if fuel prices went up, pushing up fuel bills, then this might motivate people to be energy efficient. It was also noted that staying in a property for a longer duration could motivate action. The payback period for the energy efficiency measures was clearly a major barrier where there were only short-term plans for a home:

'So there's nothing that could encourage you or persuade you at the moment' (interviewer)

'No not really – it wouldn't be worthwhile for me. My understanding was that to recoup any of my costs would take 3 or 4 years.' (#230)

In summary, the respondents identified a need to reduce the **personal costs** of engaging in EEHI in order to motivate further action; either in terms of time and effort, or in financial terms.

9.4 Implications for the conceptual framework

9.4.1 Self-interest

An examination of the reasons why people adopt certain energy efficiency measures confirms the fact that there are multiple motivations for EEHI. No single factor can account for the pattern observed in the popularity of the different types of improvement. An array of factors appear to play a role which differs depending on the individual's perception of a particular energy efficiency measure; what it is perceived to offer the householder and his/her family and what is perceived to be its personal/ familial cost. Two of the most popular measures – energy saving light bulbs and double-glazing – have been shown to appeal to householders on multiple levels. It is suggested that this ability to offer a range of different types of personal gains is an essential part of what makes these measures so popular.

There is evidence that the perceived personal cost of engaging in a particular EEHI can reduce the likelihood of action, thus providing support for the theme **personal gain/cost**. The personal cost in terms of investing time and effort is also a potential barrier to action where the perceived gain is not great enough to outweigh the perceived cost. Once again it has been shown that householders *are* prepared to invest time and effort in other non-energy efficient home improvements and that energy efficiency could be integrated at this time, thus reducing the associated personal costs. High capital outlay also emerges as a significant barrier thus supporting the theme **affordability**, which emerged in chapter 8.

The findings also provide support for the theme **procedures**, pointing to a need for provision of information about procedures associated with engaging in EEHI as a means to help reduce the perceived personal costs involved. For example, the simple fact of 'getting around to it' has been identified as a barrier to some EEHIs, particularly the more simple DIY jobs. It is proposed that clear procedural information would in these cases reduce the perception of a job being complex, difficult or time-consuming. This proposal is supported by the fact that those measures for which associated procedures are already commonly known, such as energy saving light bulbs, loft insulation and even double-glazing, tend to be more popular with householders.

There is evidence to suggest that a general sense of **efficacy** (i.e. being competent and making difference) contributes to the householder's motivation to save money, energy and the environment by engaging in EEHI. Rather than choosing the measures

most effective in any one of these areas, householders are satisfied that their efforts in some way make a positive contribution. It should be noted that this sense of efficacy, like other motivation factors, appears to act in conjunction with other factors.

If luxury, as proposed in chapter 5, is embodied in the conveniences of modern society and access to new and novel products, then there is evidence that some householders are in part driven to adopt energy efficiency measures by the luxury that they afford. For example, householders are attracted by the convenience of heating afforded by new systems and controls. Energy saving light bulbs similarly offer convenience as a function of their reliability, allowing lights to be left on for long periods for lower cost. For others there is a sense that EEHI is a part of general efforts to keep the home up-to-date in terms of state of repair, modern technology and general standards. These findings therefore support the theme **luxury** in the context of the conceptual framework. Links to other non-energy efficient home improvements, as proposed above, might provide one route to reinforcing this perspective.

9.4.2 Energy knowledge

Most energy efficiency measures are relatively invisible, however, householders note the importance of 'improved appearance' in motivating the adoption of one particular measure - double-glazing. As noted in chapter 8, double-glazing is the most **visible** of all energy efficiency measures and this plays a role in its popularity. It is also identified as the measure most likely to add value to a property and clearly this is helped by the fact that it is visible to prospective buyers. However, it has been suggested that double-glazing might appeal to householders due not only to its own visibility, but also to the 'visibility' of its associated benefits. The findings presented here suggest that both double-glazing and also energy saving light bulbs appeal to householders via these 'visible' associated benefits.

The findings suggest that in general, visible improvements to a property are valued by the householders, however, most other energy efficiency measures are not considered individually to offer this advantage. While it might not communicate anything directly about **self-identity**, double-glazing is certainly considered by most householders to communicate something positive about the standard of the property and this in turn appears to be linked to self-identity. There is evidence that other energy efficiency measures, as part of a general effort to improve a property, might similarly be thought of as improving the general appearance of a property thus reflecting a positive self-identity, despite their relative individual invisibility. This again points to the suggestion

that energy efficiency measures be framed as part of general home improvements to ensure that a home is perceived to be up-to-date, well-maintained, and of a high standard. These findings provide support for the themes visibility and self-identity in the developed conceptual framework.

There is no evidence that expected quality of life standards are acting as a barrier to acceptance of energy efficiency measures themselves. This is to be expected, since energy efficiency by definition offers the same service for reduce energy consumption. Householders are not, therefore, faced with reduced standards of comfort, convenience, cleanliness, or health as a result of an installed energy efficiency measure and householders do not appear perceive this to be the case. The procedures associated with installing an energy efficiency measure do, however, represent an inconvenience for many. In this sense it is clear that engaging in EEHI conflicts with the lifestyle routine of some householders.

As outlined above in relation to the theme luxury, increased standards of convenience, on the other hand, motivate some householders to engage in EEHI. Increased warmth and comfort are also important motivating factors for many householders. Health was not mentioned by householders without prompting and in general there is only a weak cognitive association between the energy efficiency measures and health benefits. These findings provide some support for the theme **quality of life** and suggest that in order to capitalise upon this theme as a means to engage householders in EEHI, cognitive links between the concepts within this theme and EEHI need to be reinforced.

There is evidence that some concepts are unfamiliar to everyday householders, in particular solid wall insulation and condensing boilers. Explanations therefore need to be provided in order to overcome barriers associated with this unfamiliarity. Those measures that are most familiar due to their mainstream status - energy saving light bulbs and double-glazing - are among the most popular. It could be argued that these measures are no longer considered to be specialist 'energy' products, but everyday products, since the first is found in mainstream high street shops and the second is heavily advertised via television and radio. They are therefore accessible in the everyday context and they are considered by many people to be 'normal'. Other energy efficiency measures, however, are still considered precisely that – energy measures – found in more specialised shops and rarely advertised via mass media routes. It is suggested that the most popular of these energy measures, loft insulation, has benefited from targeted promotional campaigns carried out over a number of years by

central government and utility companies. This measure (and the associated procedures) is therefore more familiar than other energy efficiency measures, despite the fact that it is currently no more accessible in the market place. While there have been promotional campaigns for cavity wall insulation and condensing boilers, these have not been so extensive or carried out for such a long duration. These findings provide support for the theme **familiarity**.

The conceptual framework also suggests that the benefits of engaging in EEHI be framed using the familiar terms of everyday discourse to make it more relevant to householders (see 5.4). The householders themselves tended to speak of the specific impacts of measures on their everyday lives primarily in relation to the more popular measures (energy saving light bulbs and double-glazing). These measures are also among the most visible. The findings suggest that there is an association between the fact that the householders can see the energy efficiency measures and also perceive their positive impacts. It is proposed that the more visible the measure, the more likely the householder is to perceive the beneficial impacts on everyday life.

Finally, the findings make clear that different factors act as motivators and barriers for different householders according to their outlook and personal circumstances. This infers that personalisation of advice to the household would enable different views and needs to be addressed and perceived barriers to be tackled. Thus some support is found for the theme **personalisation**. One means to provide this type of tailoring of advice is explored in 10.7.

9.5 Summary

Exploration of the householder's experience in pursuing recommended EEHIs has resulted in further support for the following themes, as identified in chapter 8: personal gain/cost; affordability; procedures; efficacy; visibility; quality of life; and familiarity. In addition, a qualitative analysis of the householder's views has found support for the following themes: luxury; personalisation; and self-identity. These themes relate to the everyday householder traits, self-interest and energy knowledge, as outlined in the conceptual framework.

Other than double-glazing, the householders do not generally think that individual EEHIs will improve the value of the home and are not generally aware that they improve one's experience of it. However, when the measures are conceived as part of a general effort to improve a home (especially visually) it is acknowledged that they

might be appreciated by potential buyers and they might permit an improved home experience. Double-glazing and energy saving light bulbs offer a range of benefits 'visible' to the householder. For other measures, these visible benefits appear to lie in a more general sense of updating a home and 'making it your own'.

In order to motivate further take-up of recommendations the householders identify a need to reduce the personal costs of engaging in EEHI, either in terms of time and effort, or finance. Householders currently make few links between energy efficiency and either health or quality of life. Warmth appears to be the main concept linking energy efficiency to the latter, and for some there is a general sense that well-being is linked to energy efficiency via environmental issues.

The implications of the findings for the development of the HER programme will be explored in chapter 12. First chapter 10 will explore the remaining themes of the conceptual framework.

9.6 References

- De Young, R. (2000). "Expanding and evaluating motives for environmentally responsible behavior." Journal of Social Issues 56(3): 509 - 526.
- Wilhite, H., H. Nakagami, et al. (1995). A cross-cultural analysis of household energy-use behavior in Japan and Norway. European Council for an Energy Efficient Economy Proceedings, http://www.eceee.org/library_links/proceedings/1995/index.lasso. last visited 25.08.03.

10. The householder view of the Home Energy Report (HER)

10.1 Chapter outline

This chapter presents the final set of findings resulting from the empirical study of the HER in use. The primary focus is upon the householders' views of the report itself and their direct and indirect suggestions for its improvement. The implications of these suggestions for the validity of the proposed conceptual framework are described. The chapter also addresses a number of closed questions relating to the format and delivery of the HER within the context of the proposed seller's pack programme. Potential additional sources of domestic energy efficiency information and advice are explored with a particular focus upon the possible sources of this advice and the idea of a follow-up direct advice service.

10.2 Introduction

Having explored the potential factors affecting the householders' responses to the HER recommendations, the study now turns to the householders' views about the design of the HER itself. This part of the study aims first to discover whether or not householders feel that the report could be improved. In order to invite the participation of the everyday householder in the development of the HER, the householders were asked, through the phase 2 questionnaire, how the report could be improved and what related questions they would ask, should an advisor be available. As well as directly informing the design of the programme, the resulting data have been qualitatively analysed in order to seek support for the themes of the conceptual framework.

The researcher has also pursued her own interest in a number of specific areas. First the idea of a follow-up advice service to the HER. This has been pursued in both the phase 2 questionnaire and also the phase 3 follow-up interviews, on the basis that this might permit greater personalisation of advice and a greater degree of participation by householders. Second, the researcher asked a number of closed questions in the phase 3 follow-up interviews relating to the credibility of source and the format of the energy report. These questions addressed specific issues that had been raised during the course of the research, but had not been answered in phase 2.

The presented data relate to section F of the phase 2 questionnaire as outlined in chapter 7 (see appendix C, 15.1) and to the latter questions of the phase 3 interview guide (see appendix D, 16.1).

10.3 Do you think the report could be improved in anyway?

30.9% ($\pm 5.9\%$; $n=233$, $p<0.05$) of respondents think that the report could be improved. There were 85 different suggestions for how this might be achieved. The suggestions have been categorised to reflect emergent themes, as perceived by the author (see appendix C, 15.6 for full list of responses):

- Need for more detail/ explanation of the information presented;
- Concerning the generality of the advice/ not specific to dwelling;
- Concerning the report's format/ structure/ language;
- More information about how to take advised action;
- Inclusion of alternative measures;
- Information about grants and/or associated costs;
- Explanation of calculation methods used;
- Further suggestions/comments¹.

Figure 10-1 shows their frequencies and the percentage of all responses:

¹ The further suggestions and comments tended to be more generalised comments and did not always answer the question as posed

How could the report be improved?

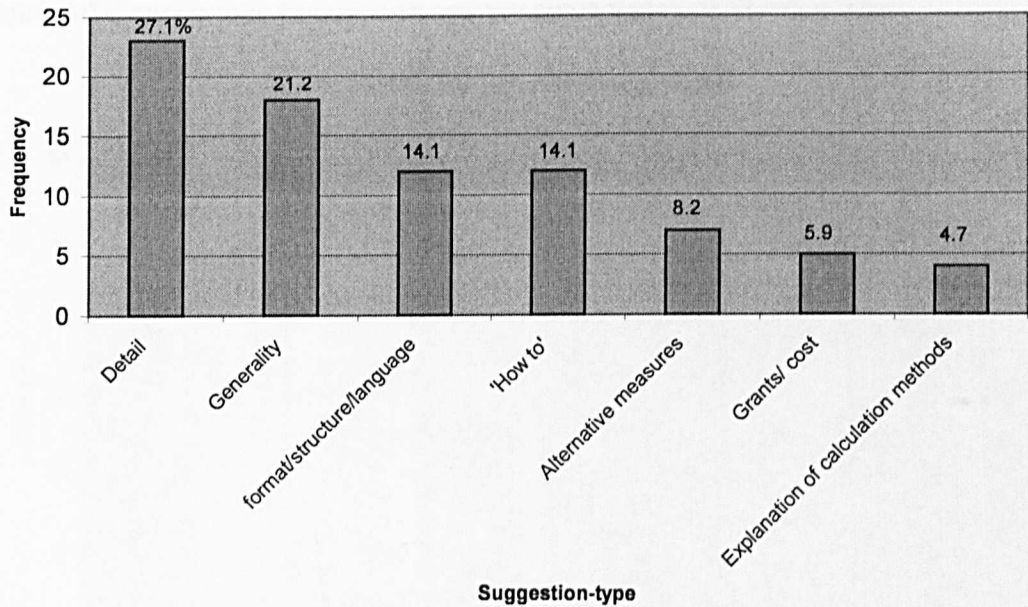


Figure 10-1: How could the report be improved?

10.4 Would it be helpful to have an advisor to ask questions?

34.5% ($\pm 6.1\%$; $n=232$, $p<0.05$) of respondents felt that it would be helpful to have an advisor to ask questions related to the energy report. This perhaps suggests that most people do not feel the need for further information, either because they feel that they know how to take the next step towards taking up the recommendations, or because they have no interest in this advice and do not intend to take-up the recommendations. Alternatively, it could be that the homeowners do feel the need for more advice and information, but simply would not know what questions to ask of an advisor. 79 questions or comments were detailed by the householders. The questions reflect similar themes to those detailed at 10.3 (see appendix C, 15.7 for full list of responses):

- Concerning detail about presented information;
- About how to take advised action;
- About grants and/ or associated costs;
- Seeking explanation of calculation methods;
- Concerning the generality of the advice/ how specific to dwelling?;
- About alternative measures;

- Further questions/ comments².

Figure 10-2 shows their frequencies and the percentages of all responses:

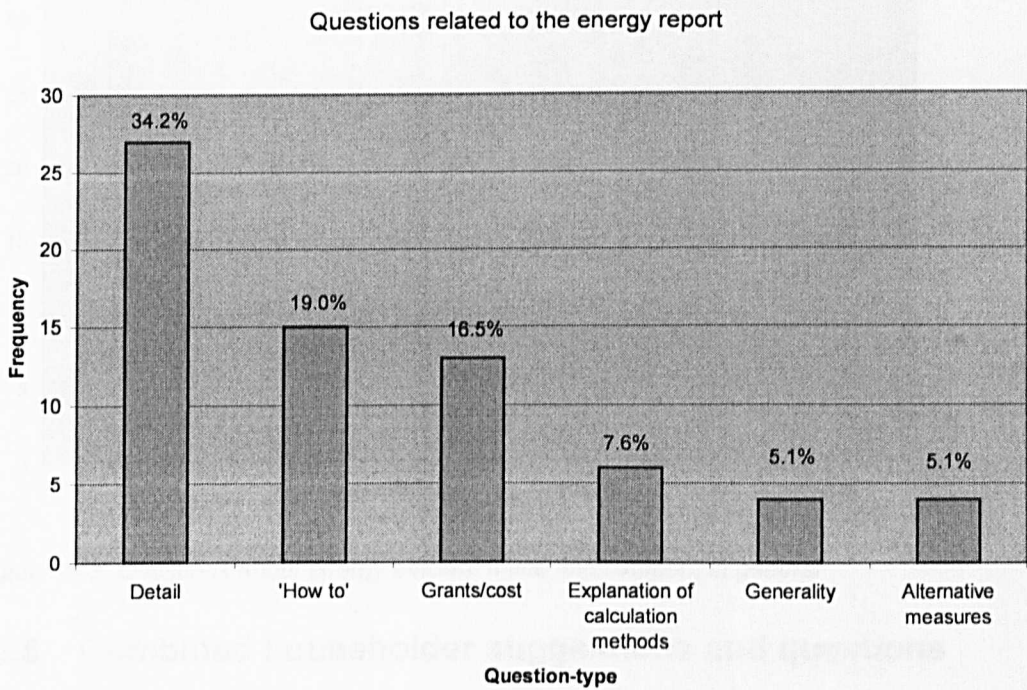


Figure 10-2: Questions related to the energy report

42.4% ($\pm 6.4\%$; $n=229$, $p<0.05$) of respondents felt that it would be helpful to have an advisor to ask questions about energy efficient home improvement in general. A total of 63 different questions (and comments) were suggested. The questions have been categorised once again (see figure 10-3 & appendix C, 15.8 for full list of responses):

- Concerning detail of possible improvements/ measures;
- About alternative measures;
- About how to take action;
- About grants and/ or associated costs;
- Other questions/comments³.

² Again, the questions/comments in the 'Further questions/ comments' category were usually quite generalised and therefore did not suggest any particular questions or themes.

³ (*Again, the questions/comments in the 'Further questions/ comments' category were usually quite generalised and therefore did not suggest any particular questions or themes.)

Questions about energy efficient home improvement in general

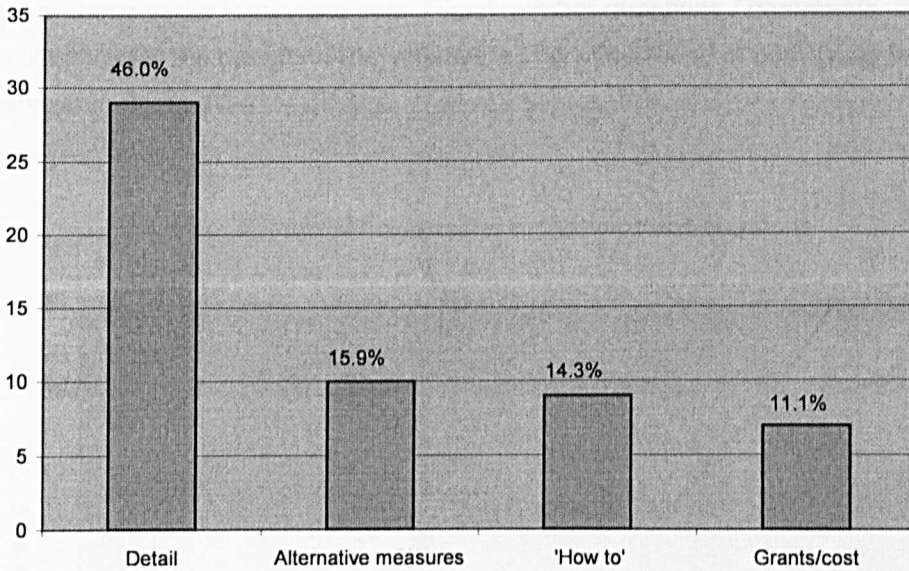


Figure 10-3: Questions about energy efficient home improvement in general

10.5 Combined householder suggestions and questions

The first three open questions in section F of the questionnaire, as outlined above, effectively represent different approaches to the same fundamental question: how can the home energy report programme be improved? While the first question asks this directly, the second two questions ask this indirectly. The resulting questions outlined by the householders relate to the energy report and to EEHI in general and hence provide insight into what further information they feel they need to facilitate or encourage them to engage in EEHI. Asking the question in these different ways appears to have been profitable: where some people were not able to give a suggestion for improvement, they had no difficulty in describing the sort of questions they would ask an advisor. Others were able to give two or three different responses where they might otherwise have stopped at one. In particular, the third question (what sort of questions would you ask about energy efficient home improvement in general?) seemed to encourage many householders to look beyond the presented information and to think more broadly about energy efficiency from their own perspective.

The 'indirect' data clearly enrich and augment the first suggestions for improvement, with a significant overlap in the emergent themes. For this reason the three data sets are here combined to facilitate effective interpretation. Those responses that clearly reiterate something already offered in the report have been eliminated from the

combined data set⁴. Repeated responses (from the same householder) have also been eliminated. This explains why the frequencies of the combined data are not simply the sum of those in the three data sets. (Total number questions / comments with implications for the design of the initiative = 174.) The result of combining the data sets is shown in figure 10-4⁵.

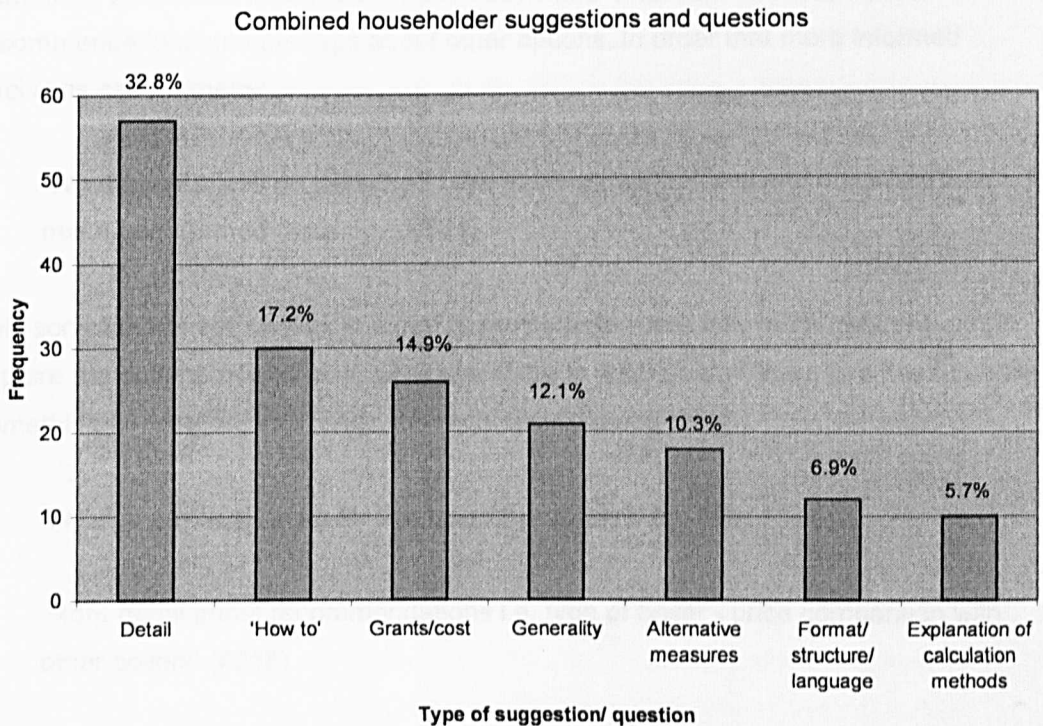


Figure 10-4: Combined householder suggestions and questions for further information/improvement of the home energy report

10.6 Implications for the conceptual framework

It should be noted that little can be inferred from the relative frequency of each response category. For example, a lower frequency for the categories 'format/structure/language' and 'explanation of calculation methods' would be expected, since only one of the three questions under examination was intended to elicit direct responses about the current design of the report. It could also be argued that certain responses could come under more than one category, however, the categorisation and labelling of the responses does provide an important stage in their

⁴ For example, the following responses: 'How to save money'; 'Generally what could be done and where'; 'Ideas for reducing fuel bills, maintaining heat etc.'

⁵ The 'further questions/comments' category has not been included in calculating the percentages shown in figure 10-4

interpretation, enabling implications to be drawn about the proposed conceptual framework.

10.6.1 Self-interest

There is a great deal of data to suggest that householders would like further **procedural information** to aid the process of taking up the recommendations. A number of comments reflect a desire to have more detailed information about the recommendations and perhaps about other options, in order that more informed decisions can be made:

'What alternatives do we have? I like to weigh up the pros and cons and then make an informed decision.' (#121)

This sort of comment reveals a desire to **participate** more fully in the process and to explore the options available. In particular there is a sense that there is a need to have something to compare and relate the recommendations to:

'What is a typical rating for this type of property?' (#173)

'More detail about recommendations i.e. type of boiler - price comparison with other boilers' (#218)

Several people also want to know more about the state of existing relevant elements of the home, presumably to also provide context for the recommendations and hence a more holistic understanding. Some specifically mention the idea of including the increase in SAP rating and reduction in CO₂ output for each recommendation, which again would further inform the process decisions and demonstrate the **efficacy** of one's actions. Other householders seem to accept the recommendations, but simply require more detailed specifications of the recommended products and materials (eg cavity wall insulation and boilers) to enable them to proceed. Direct or indirect information about how to take action (**procedures**) would also be welcomed, for example, information about recommended installers or contractors and product suppliers:

'Supply leaflets of reputable companies who specialise in energy saving products' (#250)

'Provide contact telephone numbers for governing bodies of builders etc., so that good, reliable contractors can be found. How to obtain correct materials to do the recommended tasks.' (#249)

There were several requests for information about which recommendations should be prioritised, as well as more detail about the costs involved and sources of financial aid. All of these procedural suggestions, questions and requests suggest that the householders are essentially in a positive mind about taking action – however, they require further help to enable them to do so. Without this more detailed and procedural information it is possible that the householders will experience feelings of helplessness, as discussed by De Young (2000). This helplessness is likely to lead to avoidance of the recommendations altogether and will ultimately mean that any potential energy generated by the human motivation for intrinsic satisfaction will have been wasted. De Young (Ibid) also points to the fact that the issue of helplessness and avoidance can go beyond lack of procedural knowledge – it can involve not even knowing what the right question is to ask. This is clearly a potential problem for the householder who responded as follows when asked what type of questions she/he would ask an advisor:

'Don't know what questions TO ask.' (#236)

It is likely that this lone voice represents many other householders who simply have not offered any suggestions or questions at all. Clarification of the concept of energy efficient home improvement is essential if these people are to be motivated to take positive action. Some responses point to the kind of areas that might be profitably illuminated:

'How destructive is [it] going to be?' (#225)

'What is the nature of the work?' (#160)

The householders clearly want to be able to evaluate the **personal costs** of making the recommended improvements and many responses reflect a desire to reduce these costs. In this sense, self-interest has the potential to dissuade homeowners from taking action. However, there is also a great deal of data to suggest that self-interested motives might be powerful enough to overcome this barrier.

Finally, there were many requests for alternative information and advice, for example relating to water-use, appliances and fuel-types. Most popular were suggestions and questions about solar energy. While these alternative measures might not be considered by the advice provider to be the most efficient in terms of energy or even payback, they reflect the areas that capture the householders' interests. Research suggests that pursuit of these initial interests might lead to ongoing (perhaps more effective) commitments to energy efficiency (the foot-in-the-door technique - Freedman & Fraser 1966, cited in Yates and Aronson 1983). Only by permitting householder participation in the process of getting the message across will it be possible to identify and capitalise upon these types of opportunities.

10.6.2 Energy knowledge

A number of comments within the category, 'Concerning the report's format/ structure/ language' suggest that there is a danger that advice providers assume more knowledge and understanding of specialist terms than is actually common among householders, for example:

'Reduce the use of jargon - how many lay people understand what a TRV is?/ Explain what a condensing boiler is.' (#21)

Comments to do with the report's language suggest that the unfamiliarity of the energy report makes it difficult for householders to digest. The technicality of the language is not necessarily complex; it is simply **unfamiliar**. While it remains unfamiliar it is unlikely to have meaning for the householder. The generality of the report is also cause for concern:

'The recommendations were couched in standard phrases which could have applied to any property. Cost savings quoted looked like figures plucked out of the air or, at best, generalised - probably little relevance...' (#27)

'It doesn't feel very attached to my house.' (#63)

These and other similar comments point to a need to tailor the report to the dwelling in question. This **personalisation** process does not stop at the dwelling: in order make the report relevant and meaningful to the reader its contents need to be made more familiar. This entails a reframing of the message from the perspective of the householder to put energy efficiency into the context of the householder's daily life. For

example, what will be the impact of the energy efficient improvements on those things that the householder values in the home?:

'What impact would the work have on the current decorative condition of the property?' (#1)

'...how much impact the improvement would have at time of installation – eg can't use the room - can't use electrics etc.' (#127)

Clearly there is potential to similarly frame the benefits from the perspective of the householder, as well as the potential costs, such as these.

In order to ensure that the householder will perceive the energy report to be valuable, the above comments need to be responded to. The tailoring and personalising of the report is a key part of ensuring familiarity and hence relevance. In order to effectively reframe the message, the householder's own household context and energy knowledge need to inform the expert perspective.

10.6.3 Cognitive capacity

The apparent problem with understanding the SAP rating could be due not only to a lack of full explanation, but also to the chosen presentation method:

'The maximum SAP figure is confusing with references to both 80 and 100' (#251)

Unfamiliarity also appears to have the potential to breed distrust, with many comments reflecting a desire for full explanation of the energy rating method. Many homeowners are not prepared to take ratings at face value:

'Bearing in mind that most surveys are somewhat cursory and of dubious value, I wonder how accurate and representative of the property the energy report is.' (#147)

Where properties were being remortgaged, or where the mortgagee was already renting the property in question, comments reveal that there were discrepancies between the householder's experience and the information presented, for example:

'Not all recommendations were applicable - need to question houseowner re some of the specifics to improve/ targeting.' (#55)

'[The report could be improved] By NOT recommending what is already existing' (#233)

Both use of the SAP rating and also the appearance of inaccuracies potentially undermine the **credibility** of the energy report programme. This is something to be wary of, no matter who the advice provider is, and how robust is their initial image. There were instances when householders seemed wary of the report as though it was an added unwelcome and possibly costly service.

Several suggestions emerged for improving the appearance and layout of the report, including:

'As eye-catching as an advertisement.' (#150)

'Diagrams, charts (instead of figures)' (#113)

These type of comments support previous research and the conceptual framework, which have suggested that the more **vivid** the information, the more effective it is likely to be. Someone suggested that a computer model be included to aid understanding of the report. Details could be loaded onto a protected website to enable modelling and monitoring of energy use, perhaps eventually being linked to the energy suppliers. This is one example of the way in which the benefits of various actions might be visibly **demonstrated** to householders. This particular suggestion would also permit a greater degree of householder participation in the process of improving the energy efficiency of the home. Theory and previous research also suggest that people are more likely to act on information if it is **specific**. While the recommendations might initially be perceived to represent specific advice, requests for further detail, including specific types of materials and measures, suggest that there is scope to make the recommendations even more specific and therefore, more effective.

It has been proposed that one of the benefits of the energy report programme is that it offers information at an **opportune** time. Some of the data suggest that the time of moving house is not necessarily seen to be opportune by everyone. Some first time buyers feel that they do not know what questions to ask, since they are not yet

homeowners. This could reinforce the potential problem, described above, of feeling helpless due to a lack of understanding: not only is there a potential lack of knowledge of the concept of energy efficiency but also a lack of understanding of the whole notion of homeownership. There are suggestions that it would be more useful to have information and advice when improvements are actually being considered. In particular, many first-time buyers might not be able to afford to carry out home improvements immediately. These kind of observations point to the idea of offering an additional information and advice service as a **follow-up** to the initial energy report. This idea is discussed further in section 10.7.

10.7 A follow-up direct advice service

10.7.1 Background

It is proposed that a follow-up advice service would offer a means to address many of the potential barriers to take-up reflected in the qualitative data. For example, the reinforcement and personalisation of advice would be made possible through direct provider-householder communication. The householder would be able to explore ideas and concepts in a supportive environment and would potentially be able to participate more fully in the recommendations, resulting in a positive sense of control and choice. It would also be possible to offer this advice at a time that is opportune for individual households, e.g. when funds become available or when other home improvements are being carried out. Potential feelings of helplessness and resulting avoidance could also be overcome through explanation of fundamental concepts and provision of detailed and specific procedural information. Each of the outlined factors has been shown to improve the effectiveness of energy advice in previous studies (see chapter 5) and for this reason the author chose to explore the idea of a follow-up advice service in more detail.

10.7.2 Would you use a free advice service of this kind?

Despite the relatively low positive response regarding whether or not it would be helpful to have an energy advisor to ask questions related to the energy report and about EEHI in general, 80.8% ($\pm 5.0\%$; $n=240$, $p<0.05$) of those who responded said that they would use a free advice service of this kind if offered shortly after moving into their home. Such a positive response suggests that homeowners would be open to receiving further advice and support, in order to encourage the adoption of energy efficiency measures. This clearly provides support for the theme **follow-up** in the conceptual framework.

10.7.3 Who would be suitable to act as your advisor?

A list of potential energy efficiency advisors who might offer such a follow-up advice service was proposed to the homeowners through the questionnaire. Table 10-1 shows the relative popularity of the various advisors from most to least popular.

| Energy advisor | Frequency |
|---|-----------|
| Independent energy advisor | 160 |
| Council energy advisor | 110 |
| Surveyor | 85 |
| Environmental architect | 69 |
| Installer | 63 |
| Builder | 61 |
| A DIY expert | 55 |
| Council environmental architect | 42 |
| Housing officer from the Council | 40 |
| Architect | 35 |
| Interior designer | 13 |
| Other | 6 |
| Other- specified sources: | |
| Energy research & development - universities etc. | |
| Plumber /electrician | |
| H&E services engineer professionally qualified | |
| As part of survey | |
| As part of survey /valuation with purchase | |
| Product manufacturers | |

Table 10-1: Popularity of potential domestic energy advisors

The concept of the energy advisor appeals most strongly to the householders, with the independent advisor being by far the most popular choice. The latter apparently offers more credibility than the Council advisor for most. Since the report is currently based on data gathered by a surveyor, it is interesting that the surveyor also appears to be a relatively credible and an authoritative source of advice. The environmental architect is a significantly more popular choice than the Council environmental architect, perhaps indicating that the former is perceived to offer more independent advice. It is perhaps surprising that the installer and builder are more popular than many other choices, as it could be argued that they might have a vested interest in advising householders to make more time-consuming and expensive improvements. Their relative popularity perhaps reflects the value that the householders place on practical knowledge about necessary procedures (as reflected in the questions and suggestions – section 10.5).

The relative popularity of the surveyor, installer, builder and DIY expert, indicates that there is potential to provide specialist energy efficiency advice training in these areas as a means to reach more householders. The results overall reflect the view that energy efficiency is a specialism lying at the more technical end of the spectrum. The

profession perhaps most closely related to lifestyle would be interior designer (an image fuelled by the soaring popularity of primetime television home improvement programmes), closely followed by the architect. Clearly energy efficiency is not generally associated with lifestyle by the everyday householder. Of all the entries in the top half of table 10-1, only the environmental architect represents a role that is likely to be perceived to combine the technical with aspects of lifestyle.

This follow-up service is, of course, a far more costly option than the initial home energy report. However, there is clearly potential to improve the effectiveness of the initiative by these means. The question is: could this be achieved through modification of the report? The following questions are raised:

- To what extent can the suggested improvements to the home energy report initiative be incorporated into the existing energy report itself?
- Which improvements could only be achieved through a direct follow-up advice service?

The possible answers to these questions are discussed in chapter 11.

10.8 Source and format of the HER

10.8.1 Background

Towards the end of the phase 3 interviews the researcher posed a number of questions directly related to the design and delivery of the HER in the context of the seller's pack. As the UK public's scepticism of information from the Government had been raised in the literature (see chapter 5, MacNaughton 1997) the householders were asked about their preferred source of the HER. First, a choice between the Government and an independent advice provider was given. Then the concept of the seller's pack was explained and the householders were asked if they would prefer to receive the report as part of that pack or from the mortgage lender, as they had on this occasion. The resulting data were intended to provide an indication of what the householders perceived to be a credible source of information.

One of the key issues raised by DETR to be considered in finalising the format of the report was whether it should be an integral part of the home condition report or separate (see 6.3). Therefore, this issue was directly addressed in the follow-up

interview. Since the presented data result from the small phase 3 sample, the findings are intended only as an indication of directions for further research. No statistical analysis is attempted.

10.8.2 Source

| Response | Frequency |
|-----------------------------|-----------|
| Government | 7 |
| Independent advice provider | 6 |
| Don't mind | 5 |
| Don't know | 3 |

Table 10-2: Government approved advice versus independent advice

There is a reasonably even split between a preference for government approved advice and one for an independent advice provider (see table 10-2). Five people (of 21) didn't mind which of the two sources it came from and three didn't know. For two people the choice for an independent advisor was a very definite positive choice *not* to choose the Government, a typical comment being, 'I don't trust the Government at all.' (#117) Others did, however, feel that a 'Government one would probably be less biased.' (#98)

| Response | Frequency |
|---------------------|-----------|
| Seller's pack | 13 |
| Mortgage lender | 5 |
| Don't mind/ depends | 3 |
| Don't know | 0 |

Table 10-3: Seller's pack versus mortgage lender

There was far more support for the idea of including the home energy report in the seller's pack, than for getting the report from a mortgage lender (see table 10-3). Some people said that it would depend, for example, on whether or not there was faith in the pack as a whole:

'It depends how that pack's produced – you don't know how accurate that information is.' (#118)

One person who supported the seller's pack delivery mechanism explained that he was attracted by the idea of getting all the information at once. On the other hand, those who preferred to get it from the mortgage lender felt that the seller 'could be liable to edit and possibly not mention a few things or manipulate things to make them look more attractive.' (#155) There was a sense that the seller was not to be trusted:

'what it's doing is putting the seller in the position of having the most information rather than the buyer.' (#52)

In summary, preliminary results suggest that the idea of receiving the HER as part of the seller's pack (rather than from a mortgage lender) is favoured by most people. There is no evidence to suggest that government approved advice would be considered significantly less favourable than advice advertised as being provided by an independent advisor. However, for these householders, the credibility of the source is clearly the key issue, with the credibility of the Government depending on the individual's viewpoint. Whether the HER is eventually framed as coming from the Government or an independent provider, the seller or a mortgage lender, the **credibility** of the source will need to be reinforced. This might be achieved by ensuring that the process is transparent and by hence clarifying the fact that there is no opportunity to tamper with the accuracy of the report.

10.8.3 Format

| Response | Frequency |
|-------------------------------|-----------|
| Part of home condition report | 7 |
| Separate | 11 |
| Don't mind | 3 |
| Don't know | 0 |

Table 10-4: Integral part of home condition report versus separate

There was more support for having a separate energy report than for integrating it into the general home condition report (see table 10-4). This was justified on the grounds that it would be easier to find and you might be more likely to read it than if you were faced with a lot more information. It might also prove to be more useful if separate:

'I've still got our one and we're utilising some of the information to do some stuff to the house. I think if it was integrated with the other stuff it would just get put away in the filing cabinet to gather dust until such time as you lose it ...' (#155)

In direct contrast to this view, one person felt that it should be integrated to make sure that everyone was aware of it (#152). This householder sums up the pros and cons of the two options:

'I guess it would depend on how integral you meant. If it were still identifiable within the report then that would be fine. But if it was lost among all kinds of other things, then no, I wouldn't like that at all.' (#226)

In summary, there is no clearly preferred option with regard to having the energy report separate from, or integrated into the home condition report. Interestingly the pros and cons of the two options are perceived to be exactly the same according to different parties, i.e. one option is either more or less likely to be perceived. The householder responses do, however, suggest areas that need to be addressed when designing the delivery format. On the basis of these responses it is suggested that the energy report be integrated into the home condition report, but given a separate identity that clearly relates to energy efficiency. A leaflet summarising the information might also be provided in addition to the main report which can be used as guidance when acting on or planning to act on the advice. A summary of the recommended general home condition improvements could also be included in this leaflet.

10.9 Additional opportunities for domestic energy advice

10.9.1 Times and situations for advice

| Response | Frequency |
|--|-----------|
| Making/ thinking of making home improvements | 5 |
| An advisory service every 5 or 10 years | 3 |
| When something need is broken & needs replacing | 2 |
| An update on possible improvements | 1 |
| A high street energy advisor (like you get an MOT on your car you could get an MOT on your house) | 1 |
| Prior to selling your house - in a couple of years and you want to know how you can increase the value of it | 1 |
| If planning a large-scale home improvement | 1 |
| When you've got a bit more money | 1 |
| Anytime | 1 |

Table 10-5: Other times/situations for further domestic energy advice

The findings from phase 2 resulted in the observation that energy advice received at the time of moving home might not be considered opportunistic by all households. For example, first time buyers might not have the funds at this time to carry out home improvements. This issue was explored in more detail in phase 3 by asking the householders at what other times and from what source it would be useful to receive such advice.

Two people felt that there were no additional times that it would be useful to receive domestic energy advice. All other interviewees made one or more relevant suggestions, as listed in table 10-5. Most of the suggestions are **opportunistic**: when

one is 'thinking of making home improvements'; 'when something is broken & needs replacing'; 'if you were planning to do a large-scale home improvement'; and 'when you've got a bit more money'. People also thought that the idea of a general update would be good. Every five (or ten) years seemed to be an appropriate timeframe for such a service. A survey format was favoured by some:

'I think it would be very nice to go to a high street energy advisor and like you get an MOT on your car you could get an MOT on your house.' (#230)

In summary, evidence points to a preference for information to be given at opportunistic times, as might be expected.

10.9.2 Sources of advice

| Response | Frequency |
|--|-----------|
| Via the planning office/ planning officers | 2 |
| Surveyors | 2 |
| Architects | 1 |
| Building regulations officials | 1 |
| Builders | 1 |
| Websites (the resources that you look at when you're moving house) | 1 |
| Energy advisor via electricity or gas provider (signposting) | 1 |
| Through the post | 1 |
| Homebuyer magazines | 1 |
| B&Q warehouses and the big DIY centres | 1 |
| Trade shops | 1 |
| Pamphlets | 1 |
| Something that's easy to find | 1 |

Table 10-6: Appropriate sources for further domestic energy advice

Table 10-6 lists the sources from which the householders felt it would be appropriate to receive further domestic energy advice. There was a variety of suggestions, ranging from pamphlets and homebuyer magazines to surveyors and architects. Not surprisingly there was a general underlying theme of **opportunism**: most suggested sources would be encountered automatically if carrying out home improvements or buying a home. One person specifically detailed that it should be something easy and quick to find (#141).

There were two suggestions that energy efficiency information could be given when planning permission was being sought, either via the planning office, or by building regulation officials. This timing was perceived to offer great potential:

'...when you put in your application for approval or building regs approval, at that time there is the bare minimum that you have to do by law, but what a great opportunity to say to people, well you can do this base level, but for an extra sort of £100 or whatever, or even £1000, you'll get this much more efficiency and all that, and I think there are a lot who'd say, well yeah, okay I'll do it. I think a lot of people just don't know about it.' (#160)

DIY centres (such as B&Q) and trade shops were also suggested sources of advice. It was acknowledged, however, that the latter might not be wholly appropriate at the moment, since they tend to 'put more emphasis on price and being competitive ... than selling on efficiency.' (#141)

In summary, the most popular sources of this information are those that are encountered automatically when moving or making changes to a home; i.e. opportunistic sources. While some suggestions rely on relatively major works for their effectiveness, others, such as the DIY centres, require the householder to simply carry out everyday procedures associated with moving home and minor home improvements. It is clear from many of the responses that the notion of integrating energy efficiency advice and information into already established procedures associated with moving home and home improvement appeals to the householders.

10.9.3 DIY stores as a source of advice

| Response | Frequency |
|---------------------------|-----------|
| Positive | 13 |
| Negative | 1 |
| None (question not asked) | 7 |

Table 10-7: DIY stores as a source of advice?

The interviewer followed up the DIY store idea, as it represented a particularly accessible source of opportunistic advice. In most interviews the householders were asked what they thought of this suggestion, after they had given their own relevant ideas. One person thought that it was not a good idea, 'cos it's quite plain and simple really isn't it there?' (#17) All of the other people who were asked about this idea directly (n=14) responded positively and said that they were likely to use an energy efficiency advisory service offered in a DIY store such as B&Q. Further probing into the perceived credibility of this source revealed that there were conditions attached in some cases. For example, the independence of the advisor was important for a

number of people. Even if there remained potential for bias in the delivered advice, there was evidence that the service would still be valuable:

'Yes I think I would use it as a point of reference, you know - I wouldn't necessarily rely totally on it, but yes.' (#33)

The cost of the service and/or improvements recommended was also a factor (#152). It was pointed out that in a sense this service is already provided through the instructions on a product's packaging (#113). Of course, this approach to providing advice relies on a certain level of interest and awareness in the consumer in the first place. Interest was mentioned as an important factor by another person who clarified that the information offered would need to be 'something related to something that I would be interested in normally' (#58). If she perceived the information to be 'junk', then obviously she would not seek more. Finally, the one great benefit of this information delivery mechanism over most other possibilities was highlighted – its accessibility:

'I'd probably be more likely to use it if it's something that you sort of spot when you're going out shopping, rather than something that you've got to go and book. You know, at the moment if I wanted it done again I'd have to think, well who do I go to for this? And you know, it would get put to the bottom of the priority pile, whereas if I nipped into B&Q...'

This kind of in-house service could potentially raise awareness in people who had not previously thought of pursuing energy efficiency and who might only have intended to paint their living room. Simply by existing in the shop it might attract interest and invite participation. The procedures involved in adopting energy efficiency measures could hence be demystified. Although some of the other suggested sources of advice would also reach people who were not looking to make major home improvements or pursue energy efficiency, this particular service would offer the advantage of one-to-one advice that might potentially be personalised according to the dwelling and the household's need and desires. This service might also take advantage of the opportunity to incorporate appropriate measures where householders were *already* making more major home improvements.

10.10 Summary

While only 30.9% ($\pm 5.9\%$; $n=233$, $p<0.05$) of respondents think that the HER could be improved, the data resulting from each of the open questions suggest that there is a

great deal of potential to improve the report. These data provide support for the following themes of the proposed conceptual framework: personal gain/cost, participation, procedures, exploration, efficacy, familiarity, personalisation, credibility, specificity, vividness, demonstration, opportunism and follow-up. All three of the everyday householder traits - self-interest, energy knowledge and cognitive capacity - are therefore represented in the householders' responses.

Results suggest that the majority of householders would be open to receiving some kind of follow-up information and advice. It has been argued that that this type of follow-up advice, which permits a dialogue between the householder and the advisor, would potentially allow the provider to adopt a more everyday householder-centred approach to advice provision. A number of suggestions have been made for the appropriate source of this advice. Evidence has been found that the provision of energy information and advice through major DIY centres would be acceptable and attractive to householders. It is proposed that a follow-up advice service, provided by independent advisors based within DIY centres, could be linked to the home energy report and integrated into the HER programme as a whole.

A number of additional appropriate times to receive domestic energy advice have been highlighted. The most popular sources of this advice are those that are encountered automatically when moving or making changes to a home; i.e. opportunistic sources. It has been shown that householders are concerned about the credibility of the HER as a function of its source, whether that be the Government or an independent provider, the seller or a mortgage lender. Preliminary results suggest that householders favour the idea of receiving the HER as part of the seller's pack (rather than from a mortgage lender). The pros and cons of integrating the HER into the standard home condition report and of keeping it separate have been highlighted.

The implications of all of the presented results for the conceptual framework will now be discussed. This framework will then be used to inform the development of the home energy report programme itself, focusing on an everyday householder-centred approach to programme design, as conceived in this thesis.

10.11 References

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11. Discussion

11.1 Chapter outline

This chapter summarises the research findings from each stage of the study. The implications of the findings for the developed conceptual framework are discussed and the final version of the framework is presented.

11.2 Introduction

This thesis began by identifying the need to increase the energy efficiency of the housing stock in England for reasons of climate change and for the health and well-being of householders (see chapter 2). In particular, it was noted that with 70% of households in England (14.4 million) owning their own home, the energy efficiency of the majority of the stock depends on the willingness (and ability) of ordinary homeowners to engage in appropriate home improvements. The aim of this thesis is therefore to discover how to engage owner-occupiers in England in energy efficient home improvement (EEHI).

One approach to exploring this question would have been to examine the possible statutory instruments that might be used by the Government to, in effect, force owner-occupiers to engage in EEHI. However, this thesis took as its context the current political climate in which there appears to be no intention by the Government in England to introduce retrospective energy efficiency standards for existing dwellings. Given this context, one could explore the ways in which statutory and fiscal instruments might instead be used to manipulate the market to encourage appropriate action and purchases. A recent Treasury consultation document - Economic instruments to improve household energy efficiency (HM Treasury 2002) - in fact suggests that such instruments are already well-known and limited only by political will and available resources. Perhaps then there is no need to investigate the research question further: once economic facilitation becomes possible surely the problem will be solved? But the author returns to the fact that without appropriate legislation, the success of *any* programme intended to engage homeowners in EEHI is dependent on the will of the individual homeowner. For this reason, this work focuses on the provision of information and advice as a means to facilitate a sustainable approach to engaging owner-occupiers in the energy efficient improvement of their own homes.

One might expect that after a series of informational campaigns in the UK since the 1970s, aimed at increasing the occurrence of energy conserving behaviour and

domestic energy efficiency activity among the public, EEHI programmes would have become extremely effective by the 2000's. However, the simple fact that the SAP rating in the owner-occupied stock remains so low provides evidence to the contrary. Even the activities of the Government-backed Energy Saving Trust through local energy advice centres (LEACs) were only calculated to have resulted in an average of (approximately) 1% increase in energy efficiency per annum for the owner-occupied domestic stock in LEAC areas between 1993 and 1997 (Sadler and Hamlyn 1998). Such evidence points to a need to re-examine our approach to domestic energy efficiency advice.

This thesis therefore draws on interviews with relevant programme providers and previous research within a variety of disciplines, in order to build a conceptual framework for the design of domestic energy efficiency information and advice programmes for owner-occupiers. Although it is accepted that the role of the expert is key if effective outcomes are to be delivered, the techno-economic paradigm - in which non-experts are seen as the barrier to application of the prescribed solution - is rejected. The thesis argues instead that a non-linear everyday householder-centred approach be taken by experts in the development of programmes, in order to increase the likelihood of engaging householders.

At a time when campaigners are lobbying Parliament for a new Home Energy Conservation Bill this thesis clearly has important policy implications (see ACE 2001c; Bargery 2002). In particular, the findings of the thesis have direct implications for the design of the proposed seller's pack home energy report (HER): a programme intended to specifically target homeowners and with the potential to provide information and advice for all buyers of homes on the open market in England. The findings of this study have, in fact, proved timely, with the inclusion of the seller's pack concept in the Draft Homes Bill 2003, published March 2003. Alongside this Bill, ODPM has published a consultation document inviting feedback on the content of the seller's pack integrated home energy and condition report by 30th June 2003 (ODPM 2003b). So far the implications of this thesis for the development of the seller's pack HER have only been touched upon. In the final chapter these implications will be discussed and specific recommendations will be made on the basis of the developed conceptual framework. First the research findings will be summarised and their implications for the developed conceptual framework will be discussed.

11.3 Summary of research findings

11.3.1 Building the conceptual framework

Initial interviews with providers of domestic energy efficiency programmes suggested that **'getting the message across'** lies at the heart of the provider's view of the task they face in improving the energy efficiency of the owner-occupied housing stock. Findings suggested that the challenge presented by this task is fuelled ultimately by the differences in the expert and the everyday perspectives on the problem in question. As the provider is dependent on the cooperation of the householder in ultimately engaging him or her in EEHI, the everyday perspective becomes key to the success of the programme.

An outline framework for understanding this condition was developed through qualitative analysis of the data resulting from interviews (see figure 11-1). This framework highlighted a need to focus on building an understanding of the everyday householder's traits relevant to the design of an energy information programme. This would permit the 'everyday' perspective to inform the expert's message. Thus, a theory was proposed: that an everyday householder-centred approach to domestic energy efficiency programme development would improve effectiveness.

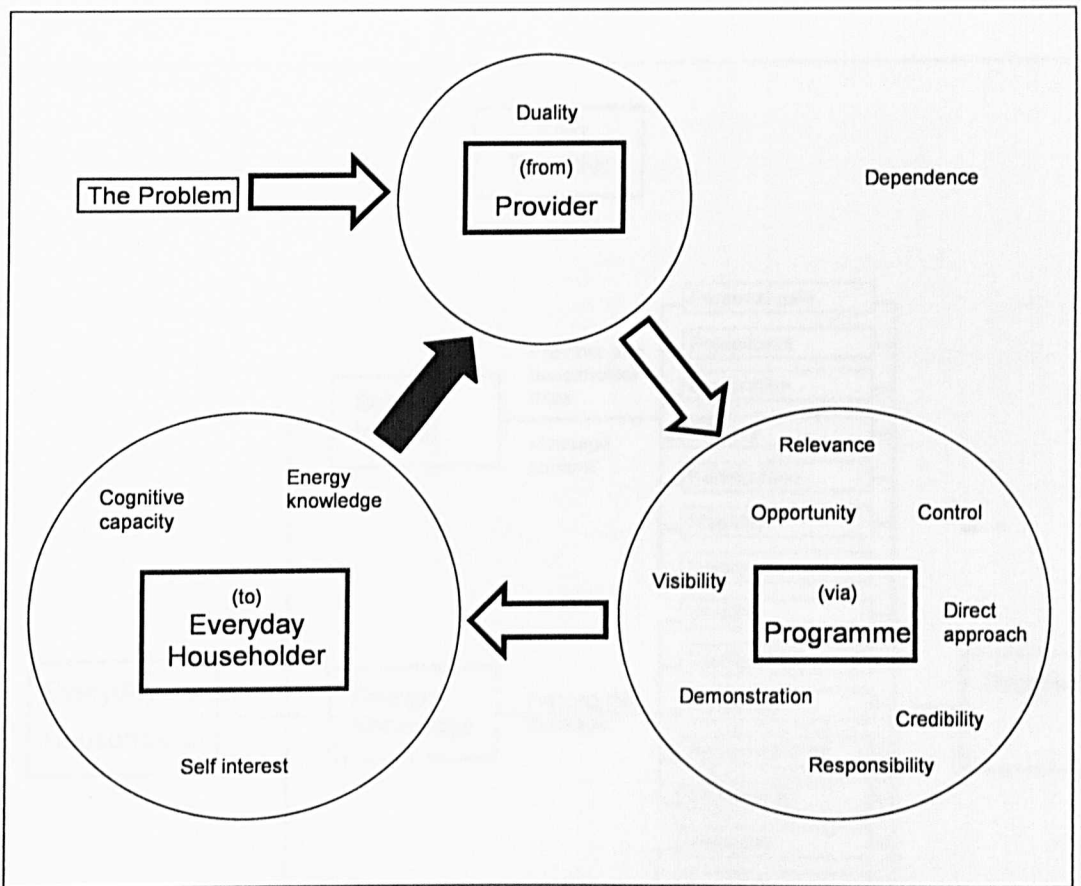


Figure 11-1: A representation of the outline conceptual framework: 'Getting the message across'

The concept of the everyday householder was further explored in the context of so-called environmentally responsible behaviour (ERB), through a review of literature. The emerging themes were subsequently interpreted to represent three key areas, each being associated with the inclinations and capabilities of the everyday householder: self-interest; energy knowledge; and cognitive capacity. These disparate areas of the literature were integrated in the concept of the everyday householder and formed the basis of a conceptual framework for understanding the relationship between the householder and the energy efficiency programme (see figure 11-2)

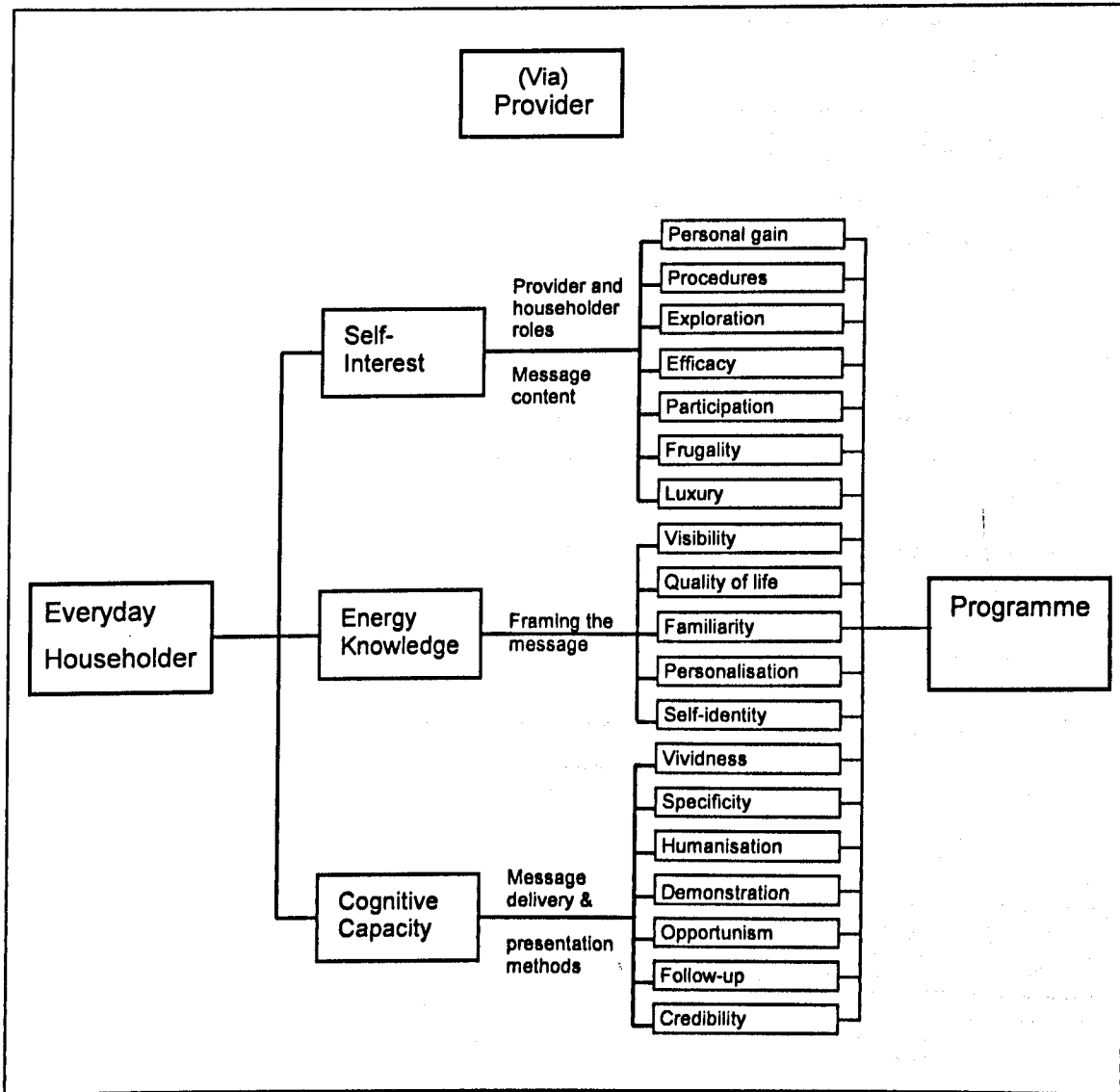


Figure 11-2: Diagram to summarise the implications of the everyday householder-centred approach to programme design: post literature review

Drawing on the guidance provided by the conceptual framework, householders themselves have been invited to participate in the process of defining a 'solution' to the problem of how to engage owner-occupiers in EEHI. Participation has been achieved by eliciting the response of homeowners to one particular EEHI advice initiative - the home energy report (HER). This report, as part of the proposed seller's pack programme, has been identified as having the potential to become a highly influential part of Government policy in the context of a long term, sustainable approach to private sector domestic energy efficiency.

The participatory research that has been carried out not only offers theoretical interest in relation to the development of the conceptual framework, but it also permits the householders to inform the development of the HER programme. In the following sections the results of the householder participation are discussed in so far as they provide support for and inform the development of the proposed conceptual framework. The outcome of this discussion is shown in the modified (final) version of the conceptual framework at figure 11-3. The themes in bold indicate the changes resulting from householder participation. See figure 11-2 to compare with previous framework diagram.

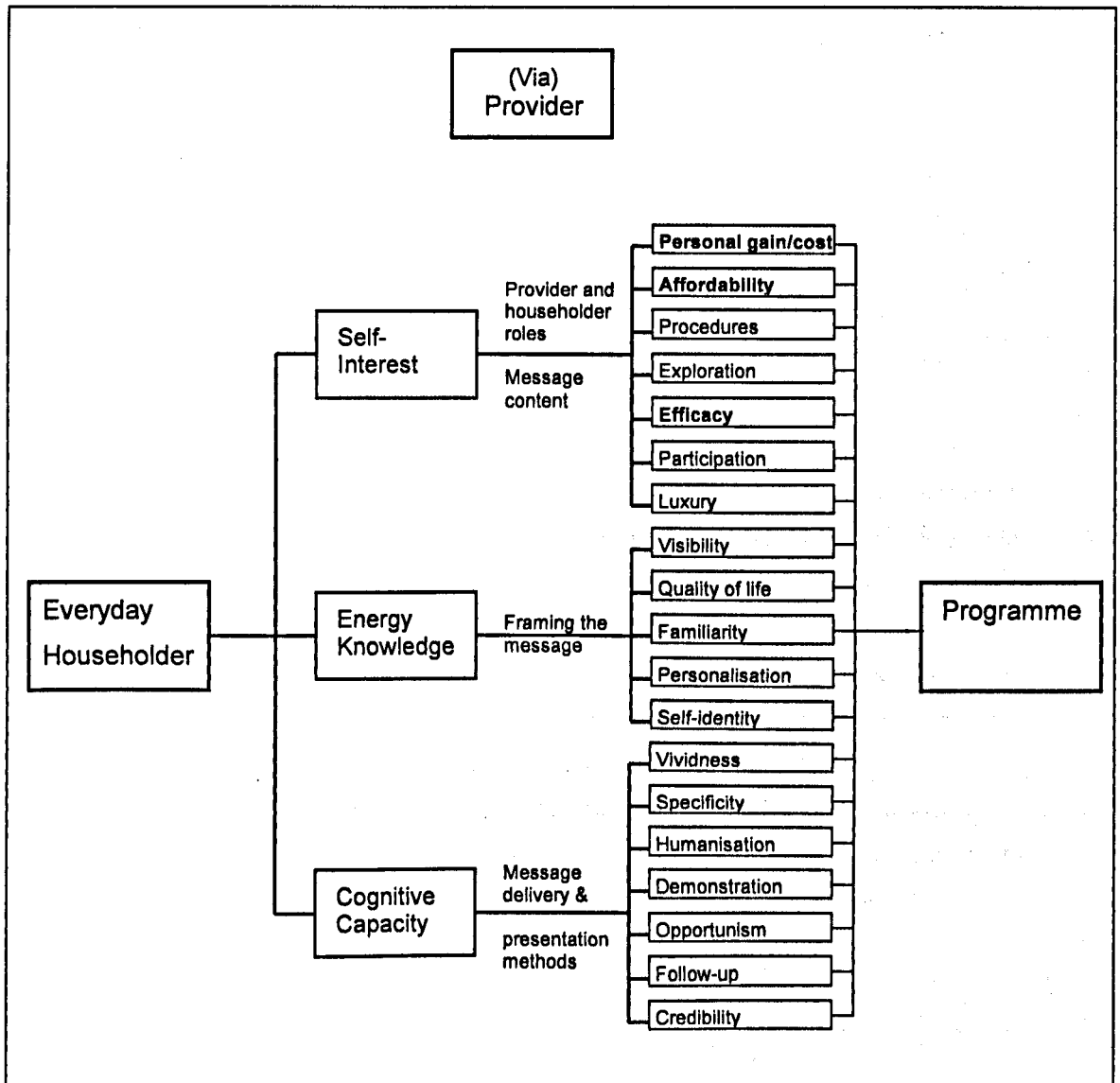


Figure 11-3: Diagram to summarise the implications of the everyday householder-centred approach to programme design: post householder participation

11.3.2 Self-interest

The conceptual framework addresses two alternative conceptions of self-interest. The first, a selfish notion of self-interest, implies that it is possible to motivate EEHI by highlighting the consequent personal gain outcomes. The second version of self-interest focuses on the self-generated and more durable intrinsic satisfaction as a source of motivation. The conceptual framework proposes that self-interest has the potential to motivate householders to engage in EEHI, but also acknowledges its potential to act as a barrier to success. These proposals have specific implications for the content of the message delivered by the domestic energy efficiency programme and for the roles that are played by the programme provider (expert) and the householder. These implications are explored through the following themes.

Personal gain/cost and affordability

The results presented in chapter 8 provide support for the conceptual framework, showing that householders perceive personal gains such as money saving, energy saving, keeping the heat in, comfort and increased convenience to be among the most important reasons to adopt the recommended energy efficiency measures. The perceived importance of these gains is not, however, reflected in the take-up of measures.

While saving money is perceived as the most important motivational factor, *spending* money is clearly perceived by homeowners to be the greatest barrier to action. This is explained in two different ways: first, that the homeowner perceives that she/he cannot afford the financial outlay required for the measures; and second, that the payback time for the measures is too long. The next most important barrier also focuses on money, indicating that the homeowner's priorities for spending lie elsewhere, with things like holidays, cars and clothes coming first and hence leaving no funds for energy efficiency measures. The influence of cost is in part supported by the relative popularity of measures according to householder intentions and actual take-up. Although cost alone does not dictate the popularity of the measures, two of the most expensive measures do prove to be the least popular.

On the face of it, it is perhaps odd that saving money is perceived to be the most important motivator while spending money is the most important barrier to EEHI. Exploratory factor analysis of the data offers further insight into those factors that underlie the householder responses. In particular, one factor is interpreted to provide clear support for the theme personal gain/cost, as it includes almost all listed factors thought to relate to potential personal costs: I'm not going to be living in the house for

long enough; I can't be bothered; It will take too long to get the money back in reduced fuel bills; and It involves mess and hassle.

Interestingly, the personal cost factor does not include: It will mean I can't afford other things (holidays, cars, clothes etc.); and I can't afford it. Instead these variables constitute a separate factor - labelled 'affordability'- suggesting that in fact affordability is conceptualised as something other than a personal cost by the everyday householder. This infers that the householders do not think of this as a matter of choice – they perceive that they simply cannot afford to carry out energy efficiency improvements, despite the fact that they would like to receive the resulting personal gain; financial savings. In other words, they *would* act if the money was available, but they do not think that it is. Affordability is therefore identified as a separate theme within the conceptual framework with additional implications for programme design.

High capital outlay was frequently cited as a barrier to action in the follow-up interviews (chapter 9), providing further support for the theme affordability. The data from these interviews also provide further support for the theme personal costs. In particular, householders identify a need to reduce the time and effort involved in EEHI in order to motivate further action. It is noted, however that this only becomes relevant where the perceived gain is not great enough to outweigh the perceived cost. Results suggest that DIY measures could be particularly prone to falling into this category.

Procedures

The conceptual framework proposes that the provision of procedural information will increase the likelihood that the intrinsic motivation for competence will drive EEHI. One of the underlying factors influencing householder intentions to emerge from exploratory factor analysis (chapter 8) relates directly to the theme procedures. The factor includes the variables: I don't have enough reliable information on what to do; I have no time to do it/ organise it; I do not have the necessary DIY skills; and I can't find a reliable installer/supplier. Each of these is concerned with immediate practical constraints and could be alleviated through the provision of procedural information. Factor analysis cannot identify the strength or direction of this influence, however, follow-up interviews point to a desire among householders for information about the procedures associated with engaging in EEHI. Results suggest that such information could reduce the perception of a job being complex, difficult or time-consuming, especially in the case of the more simple DIY jobs. This proposal is supported by the fact that those measures for which associated procedures are already commonly known, such as energy saving

light bulbs, loft insulation and even the non-DIY measure double-glazing, tend to be more popular than those less known (see chapters 8 & 9).

The householders' direct and indirect suggestions for how to improve the home energy report (presented in chapter 10) also provide support for this theme. The results suggest there is a need for information: about recommended installers, contractors and product suppliers; about which recommendations should be prioritised; and more detail about the costs involved and sources of financial aid. These details could be offered either in the report itself, or the report could signpost the reader to other sources of such information.

There is also evidence to support De Young's claim that the issue of helplessness and avoidance can go beyond lack of procedural knowledge – it can involve not even knowing what the right question is to ask. Clearly in this situation - where the very concept of energy efficient home improvement is alien to the householder - the information programme needs to be proactive in explaining the procedures associated with the recommendations and should not assume knowledge. It should be noted, however, that an overload of information can also lead to feelings of helplessness. Hence a balance must be struck. This has implications for the structuring of presented information, suggesting that a clear hierarchy might be necessary to enable householders to pick the level appropriate to their existing knowledge and experience.

Exploration

The conceptual framework suggests that in addition to offering appropriate procedural information, it is necessary to provide an environment which supports exploration in order to facilitate the use, or furthering, of competence.

Householder comments and suggestions provide evidence of a desire to explore more thoroughly the field of EEHI and the particular recommendations made in the home energy report (see chapter 10). Householders would like more detailed information about the various options available to enable an exploration of alternative courses of action. Many clearly feel that they need a greater understanding of the recommended measures and of the context for these recommendations before they can make a decision about how to proceed. This desire to explore the issues in order to gain knowledge and understanding could again be supported through provision of further information and through signposting further sources of such information.

Efficacy

Drawing on the intrinsic motivation for competence, the conceptual framework also suggests that communicating the positive effects of EEHI to householders might increase a sense of personal efficacy and thus encourage action.

Factor analysis reveals that one of the factors underlying the householders' intentions supports this theme. This factor included the following variables: to reduce fuel bills/ reduce spending on fuel; to reduce waste/ keep the heat in; to reduce energy consumption; and to reduce impact on the environment. Where one might have assumed that reduced spending would have been conceptualised by the householders as a personal gain, this result suggests otherwise. While attitudes towards waste and environmental impact have not traditionally been associated with each other, or with attitudes to saving money and energy, this factor suggests that it is in fact an underlying attitude towards the concept of reduction that affects the householder responses to each of these outcomes. This is interpreted to reflect the theme efficacy and suggests that efforts to reduce fuel bills are also perceived to be a means to exhibit competence.

All of the constituent variables in this factor, other than 'to reduce impact on the environment' could also be interpreted to relate to the theme frugality. Previous research found that frugality was separate from other competence-related factors (De Young 2000). However, the results of this study suggest that the underlying motivation for competence might drive attempts to be frugal in the same way that it drives attempts to reduce impact on the environment. For this reason the theme frugality, which was originally suggested as a separate theme in the conceptual framework, is now integrated within the theme efficacy.

Follow-up interviews offer further support for this theme. Rather than referring to the absolute level of financial saving offered by specific measures, householders appeared to justify their energy efficiency actions in terms of a broad notion that some kind of saving, or attempt to save, was being made. This was true even when their energy efficiency measures were relatively ineffective in this context. Suggestions and comments relating to how the report might be improved show that several householders desire further evidence to support the efficacy of the recommended actions. This could be achieved through the communication of SAP rating increases and reductions in CO₂ output for each recommendation.

Participation

A further category of intrinsic satisfaction is participation. Literature suggested people derive satisfaction from a sense of being needed and being able to make a difference. The conceptual framework therefore proposes that offering opportunities for the householder to participate in defining a solution is likely to make an EEHI programme more effective. Active participation can result in a positive sense of choice and control and can also permit exploration of 'solutions' attractive to the householder in addition to those considered by the expert to be optimal. Thus, in permitting the householder an active role in the process, the programme might capitalise on the foot-in-the-door technique, where small initial steps might lead to greater, more effective investments over time.

Although there are anomalies, results suggest that those measures more likely to be tackled DIY tend to be more popular than those measures more likely to be installed by a professional. It is acknowledged that cost and installation methods are mutually supportive and hence it could simply be cost that determines this popularity. However, it is proposed that 'Do It Yourself' could offer an extra dimension to motivation, since this enables the active participation of householders in working towards a solution. Further research is needed to explore this proposal more thoroughly.

Many of the comments from householders relating to how to improve the HER reveal a desire to participate more fully in the advice process. Individuals want to know how the information has been arrived at; they want further details about recommended measures and the options available. These requests all point to a desire for a greater sense of control and choice.

Luxury

Luxury is the third and final category of intrinsic satisfaction identified in the conceptual framework. It is proposed that a sense of satisfaction can be derived from luxury which is itself embodied in the conveniences of modern society and access to new and novel products. Taking this definition as the point of departure, the results provide evidence that some householders are in part driven to adopt energy efficiency measures by the luxury that they afford. First, 'to increase convenience' is perceived by the householders as being among the most important factors motivating take-up of the recommended energy efficiency measures. Follow-up interviews show householders associate convenience with particular measures, namely new heating systems and controls, energy saving light bulbs and thermostatic radiator valves. There is also evidence that for some householders EEHI is motivated by a broader desire to keep

the home up-to-date in terms of modern technology and general standards of repair. This association between luxury and energy efficiency also occurs where energy efficiency is part of other major refurbishment/extension works which are themselves perceived to improve the home experience. In order to capitalise on the motivational power of luxury, EEHI programmes would need to frame the energy efficiency measures as 'mod cons', emphasising the convenience that they afford the householder and their up-to-date, novel qualities. This is more likely to be possible for those measures at the high-tech end of the scale, such as heating systems, where new generation technology tends to be phased-in to replace the old.

11.3.3 Energy knowledge

Energy knowledge refers to the householder's conceptualisation of energy consumption and conservation (after Shove 1997:2), based on the notion that what counts as energy is determined by how it is known and experienced. An expert's conceptualisation of energy, based on an understanding of invisible processes and knowledge of appropriate terminology, is unlikely to offer meaning to everyday householders within the context of their everyday lives. On this basis, the conceptual framework proposes that the message should be built on an understanding of the householder's energy knowledge: on the meaning that the everyday householder finds in energy, energy consumption and energy efficiency through experience and accumulated knowledge. The ways in which this might be achieved are explored through the following themes.

Visibility

Literature suggested that the (in)visibility of energy and energy efficiency affects the householder's energy knowledge. The conceptual framework therefore proposes that visibility is a key factor in engaging householders in EEHI and that in order to render the message more understandable and meaningful, the energy efficiency measures and their effects need to be made more visible to householders.

The findings suggest that in general, visible improvements to a property are valued by householders, however, most energy efficiency measures are not considered individually to offer this advantage. Double-glazing is the exception and it is suggested that the visibility of this measure might play a role in its popularity. Other relatively visible energy efficiency measures do not prove to be more popular than the less visible measures. Perhaps more important in the context of energy efficiency measures is the visibility of their effects. The follow-up interviews provide evidence that two of the most popular measures, energy efficient light bulbs and double-glazing, are indeed

popular due to the 'visibility' of their effects. Increased comfort and reduced fuel bills are noted, but in addition there are many other effects that do not relate directly to energy efficiency. All of these highly visible 'added-value' benefits relate to the householders' everyday experience in the home, ranging from being able to leave the light on, to reducing sound levels. The results suggest that householders do not tend to make links between invisible energy efficiency measures and their impact on everyday experience, whether they be directly related to energy efficiency, or to other associated benefits. This is despite the fact that these measures represent some of the most effective in terms of increased comfort.

When asked whether energy efficiency measures would increase the value of a home it was clear that most people felt that they wouldn't, due to their invisibility. However, where they were part of a general improvement in the standard of the home they could potentially contribute to a better appearance and hence improve the home's value.

It is proposed that EEHI programmes need to make clear the links between the less visible energy efficiency measures and their potentially 'visible' effects on everyday experience in the home. The results support the fact that these 'visible' effects can motivate householders to take-up measures, however, such benefits currently tend to go unrecognised by householders.

Quality of life

The conceptual framework proposed that householders perceive a need to maintain quality of life, represented by expected standards of comfort, cleanliness and convenience. On this basis the programme message should be framed to ensure the everyday householder is aware that energy efficiency will not in any way erode these standards. In addition, where quality of life is potentially improved through EEHI, this should be communicated in order to engage householders.

Factor analysis revealed a factor underlying the householders' intentions that related to quality of life reflected in the following constituent variables: to improve temperature for health reasons; to increase comfort / make the house warmer; and to increase convenience. The literature has not previously directly associated health with the expected quality of life standards that result from adopted lifestyle. However, previous researchers have suggested that lifestyles are associated with, or even driven by, certain expectations with regard to standards of cleanliness or hygiene (Palmborg 1995; Shove 1995b). The findings support the notion that cleanliness and hygiene are associated with health in people's minds and suggest that the potential to motivate

EEHI on health grounds lies in framing health as another life-style associated, quality of life standard. One might expect the variable 'to reduce fuel bills/ reduce spending on fuel' to also be included here, since it infers an increase in disposable income. The fact that it is not suggests that reducing spending, in this context, is not perceived to offer quality of life benefits.

The findings of the follow up interviews suggest that the association between quality of life and energy efficiency is weak among householders overall. Health, in particular, was not mentioned by householders in the context of energy efficiency measures without prompting. Few householders associate the broad notion of energy efficiency with quality of life standards, but this tends to occur more readily where energy efficient improvements are part of other refurbishment/extension works which are themselves perceived to improve the home experience. While specific measures (such as double-glazing, energy saving light bulbs, trvs and heating controls) are occasionally linked to increased standards of convenience and comfort, their benefits are more commonly recognised to lie in the realm of energy and financial savings.

Results do suggest, however, that householders are driven to make their homes warmer, cosier and also light and bright through standard (non energy efficient) home improvements. Energy efficiency measures can also offer such qualities, but there is a need to make this clear to householders through marketing and communication techniques. The results suggest that there is potential to achieve this by integrating energy efficiency measures into packages of standard home improvements which are already perceived to offer such quality of life benefits.

There is no evidence that householders associate energy efficiency measures with reduced standards of comfort, convenience, cleanliness, or health and hence there is no evidence that quality of life standards are a barrier to domestic energy efficiency. The procedures associated with installing an energy efficiency measure do, however, represent an inconvenience for many. In this sense it is clear that engaging in EEHI conflicts with the lifestyle routine of some householders.

Familiarity

The conceptual framework proposes that the benefits of engaging in EEHI be framed using the familiar terms of everyday discourse to make it more relevant to householders. The familiarity of the measures themselves is also relevant to this theme, with the more familiar measures expected to be more popular with householders.

Popularity rankings provide preliminary evidence that the more familiar measures are more popular than those less familiar. Follow-up interviews provide support for the idea that this is due to their accessibility and promotion in the market place and through national promotional campaigns. It is proposed that the most familiar measures are no longer considered to be specialist 'energy' products, but everyday 'mainstream' products, since they are found in high street shops and/or heavily advertised via mass media. Other energy efficiency measures, however, are still considered precisely that – energy measures – found in more specialised shops and rarely advertised via mass media routes. Follow-up interviews provide evidence that some concepts associated with these measures and their installation procedures are unfamiliar to everyday householders. Loft insulation provides the exception, being very popular despite the fact that it is currently no more accessible in the market place than other specialised energy products. This suggests that the extent and duration of targeted promotional campaigns by central government and utility companies has been successful in elevating this measure to 'mainstream' (i.e. familiar) status.

Many householder comments relating to how the HER could be improved focus on the report's language and suggest that unfamiliarity of language makes it difficult for householders to digest. The technicality of the language is not necessarily complex; it is simply unfamiliar. This provides further support for the theme familiarity, suggesting that the message should be reframed from the perspective of the householder to put energy efficiency into the context of the householder's daily life.

Personalisation

Literature suggested that personalisation increases the salience of energy information. The conceptual framework therefore proposes that the message be framed in such a way that targets the householder's understanding, needs and aspirations. This will allow the householder to perceive the relevance and meaning of the message.

The phase 2 and 3 findings make clear that different factors act as motivators and barriers for different householders according to their outlook and personal circumstances. This infers that personalisation of advice to the household would enable different views and needs to be addressed and perceived barriers to be tackled. Many householder comments provide evidence that the generality of the information in the HER report is cause for concern. It is clear that householders would find greater value and relevance in the advice if it related more closely to their own personal situation. In

order to effectively reframe the message, the householder's own household context and energy knowledge need to inform the expert perspective.

Self-identity

Literature suggested that there might be potential for the meaning imbued in domestic energy efficiency measures to offer a narrative of self-identity. The opportunity to express self-identity might therefore provide a means to engage householders in EEHI. However, it emerged that only the more visible measures tend to offer this opportunity, since invisible measures inevitably send only weak signals to others. Alternatively, personally negotiated definitions of self, such as 'environmentally aware person', might support the adoption of EEHI, thus relying less on the visibility of the measure itself. The conceptual framework therefore proposes that there is potential to frame the message in such a way that cognitive links are made between self-identity and EEHI, which might in turn engage householders in EEHI.

The findings support the literature and suggest that visible improvements are more likely to be considered to offer an advantage than those that are invisible (see Visibility). This coincides with the idea that visible measures are more likely to offer an expression of self-identity. However, as one would expect, householders did not refer directly to their self-identity in the context of EEHI and hence there is little evidence to suggest that the opportunity to visibly express self-identity currently drives this activity. However, the general standard of the home is clearly important for some and energy efficiency measures are seen to contribute to this standard. It is inferred that this general standard is perceived to be a reflection of self-identity - whether this be 'someone who keeps their home in order' or 'someone interested in the latest technology'. It is therefore proposed that there is potential to frame energy efficiency measures as part of general home improvements that help to ensure that a home is perceived to be up-to-date, well-maintained, and of a high standard.

A few householders did make reference to their general interest in and support for the concept of energy efficiency and linked this to their previous energy efficiency activity and their intentions. This offers support for the idea that personally negotiated definitions of self might drive EEHI. In order to capitalise on the potential of such self-identities to engage householders in EEHI it will be necessary to ensure that the energy efficiency and environmental benefits of the measures are made clear.

11.3.4 Cognitive capacity

Cognitive capacity represents the ability of the householder to process information and the householder's associated tendencies. Many authors conceptualise the limits of human cognitive capacity as a potential barrier to successful delivery of the message (Anderson and Claxton 1982:163; Kempton and Montgomery 1982; Weber 1999). However, the presented conceptual framework takes the alternative position; that it is the environment in which information is presented that plays a critical role in limit definition. The framework therefore proposes that cognitive capacity is a resource that can support motivation (see Kaplan 2000:505), providing the informational environment is compatible with fundamental human inclinations and capabilities related to learning and understanding. The primary implications of this proposal lie in the way in which the programme is delivered and the information is presented. These implications are explored through the themes below.

Vividness

The literature suggested that information needs to be vivid in its presentation format if it is to be first perceived and then remembered. The conceptual framework therefore proposes that the message will be more effective in engaging householders in EEHI if its presentation is made vivid through eye-catching techniques. The research findings provide support for this theme, with householders offering several suggestions for improving the appearance and layout of the HER which would improve the vividness of the report (chapter 10).

Specificity

Previous research also suggests that people are more likely to act on information if it is specific. The conceptual framework therefore proposes that the message will be more effective if it is specific in its recommendations. The fact that specific recommendations are made in the HER was outlined as a potential benefit of the programme in chapter 6. However, numerous householder requests for further detail about the recommendations suggest that there is scope to make these even more specific and therefore, more effective. In addition there are a great many concerns that the advice given was not specific to the dwelling in question – perhaps being based on estimated figures - and hence not directly relevant to the reader. These findings provide support for the theme specificity. They suggest that the effectiveness of programmes to engage householders in EEHI will be improved if details are provided in order to specify the recommendations more clearly and if the advice is made specific to the dwelling in question.

Humanisation

Literature suggested that the effectiveness of energy information might be increased by a movement toward 'humanised' media, for example, video, community role models and local networks (Ester and Winett 1981-1982). It was therefore proposed in the conceptual framework that the message would be made more effective in engaging householders in EEHI if such 'humanised' delivery methods were used. Little emerged in the research findings to support this theme, perhaps due to the fact that it was not addressed directly. One respondent did illustrate the way in which humanised delivery channels (i.e. via a known plumber) can actually prevent energy efficient choices. This points to the need to raise awareness among installer and professionals who come into contact with householders. This theme will need to be investigated further.

Demonstration

Previous research suggests that demonstrations - including social diffusion - offer another means to render energy information more vivid. On this basis, the conceptual framework proposes that the effectiveness of the message can be increased through modelling techniques that visibly demonstrate the positive effects of engaging in EEHI.

It was suggested in chapter 6 that the HER might for some householders provide an effective demonstration of the effects of engaging in EEHI by showing the potential outcome in terms of SAP rating, reduced fuel bills and CO₂ emissions. A number of suggestions for how to improve the HER indicate that some householders do not find the HER a sufficiently vivid demonstration. Some specifically mention the idea of including the increase in SAP rating and reduction in CO₂ output for each recommendation, which would further inform the decision making process. There was even a suggestion for an alternative, more vivid means to demonstrate the effects of engaging in EEHI.

The findings suggest that some householders do desire a demonstration of the potential effects of their proposed EEHI. It is suggested that while the HER goes some way towards offering such a demonstration there are far more vivid techniques available that might improve the effectiveness of the programme.

Opportunism

Evidence from a number of studies suggested that the opportunistic delivery of advice can increase its effectiveness (e.g. DoE 1996b; Green, Darby et al. 1998; JRF 1998; Darby 1999). The conceptual framework therefore proposes that opportunistic delivery methods will increase the effectiveness of the message in engaging householders in

EEHI. It was suggested that the HER represents such a delivery method since it offers advice when the householder is considering moving home and hence she/he is likely to already be considering home improvement.

One of the factors underlying the householders' intentions provides support for this theme, being made up of the following constituent variables: to replace or repair something that has to be dealt with anyway; a loan or grant is available to part-fund the work; and other home improvement work is going on anyway so it is easy to do. Each variable is concerned with making the installation of energy efficiency measures easier to achieve through taking advantage of a relevant opportunity; hence the factor was labelled 'opportunism'.

Follow-up interviews provide specific examples of householders who recognise the opportunity to incorporate energy efficiency measures into other home improvements, take advantage of a grant, re-use available materials, or replace existing inefficient broken measures with more efficient versions. However, these findings also provide evidence that the opportunistic timing of energy advice might differ for different lifecycles. While the initial HER might be opportunistic for some, first time buyers and those who expect to live in the home for the long-term will require further advice as they consider improvements. The findings suggest that opportunism is a key factor in the effectiveness of advice and hence provide support for the theme of the same name.

Follow-up

Literature suggested that follow-up advice sessions can reinforce the message, prompt clients into action or build on what has already been achieved. It is particularly important to use follow-up sessions (or back-up material) where a great deal of information needs to be communicated, as an initial overload of information can result in feelings of helplessness and little will be remembered. The conceptual framework therefore proposes that follow-up methods be used to reiterate and/or build on the initial message in order to increase the programme's effectiveness.

Perhaps surprisingly, relatively few householders felt that they would like to have an advisor to ask questions related to the HER (34.5%± 6.1%; n=232, $p<0.05$) or about energy efficient home improvement in general (42.4% ±6.4%; n=229, $p<0.05$).

However, results suggest that the majority of householders would be open to receiving follow-up information and advice if offered shortly after moving into their home (80.8% ± 5.0%; n=240, $p<0.05$).

Observations about the opportunistic timing of advice for different lifecycles provide support for the notion of a follow-up service. This issue was explored in more detail in the follow-up interviews in which householders offered a range of suggestions for other times and situations in which it would be useful to receive domestic energy advice. Evidence points to a preference for information to be given at opportunistic times, providing further support for the theme opportunism. It is clear that the notion of integrating energy efficiency advice and information into already established home-buying and home improvement procedures is attractive to householders.

The idea of offering advice via DIY stores was explored in more detail on the grounds that it represents a particularly accessible source of opportunistic advice. Initial evidence suggests that the provision of energy information and advice through major DIY centres would be acceptable and attractive to householders. It is argued that this type of service, as a follow-up to the initial HER would permit a dialogue between the householder and the advisor allowing the householder to participate more fully in the process of defining a solution, ultimately allowing the provider to adopt a more everyday householder-centred approach to advice provision. In summary, the findings offer support for the theme follow-up, suggesting that EEHI advice programmes might be more effective if follow-up advice is offered in addition to the initial report delivery.

Credibility

Literature suggested that in order to ensure that the programme message is evaluated positively there is a need to establish the information as credible (Craig and McCann 1978; McGuire 1985; Coltrane, S. Archer et al. 1986; Constanzo, Archer et al. 1986; Dennis 1990; Hedges 1991; Stern 1992). The information source and delivery method are factors in this credibility. The conceptual framework therefore proposes that the message will be more effective in engaging householders in EEHI if the message itself is perceived to be credible, if it originates from a credible source and if it is delivered via credible means.

There is evidence that the message itself is not in fact credible to some householders who either know the information to be incorrect or who are suspicious of the means of generating the information due to a lack of explanation. The credibility of information source and delivery method was investigated in two stages. First the preferred source of follow-up advice was explored in the self-completion questionnaire, with results suggesting that the independent energy advisor and Council energy advisor are considered to be particularly trustworthy by everyday householders. The surveyor - the professional who collected the information for the HER - also offers a relatively credible

and an authoritative source of advice. Suggestions for times and situations in which it would be appropriate to receive advice also offer insight into what sources and delivery methods are considered by householders to be credible. For example, planners, surveyors and architects were all mentioned.

Second, evidence from the follow-up interviews suggests householders are indeed concerned about the credibility of the HER itself as a function of its source, whether that be the Government or an independent provider, the seller or a mortgage lender. However, there was no evidence to suggest that the Government would be considered any less credible than an independent advice provider overall. Preliminary results do suggest that the seller's pack would be chosen by the majority of householders as a means of delivery in preference to the mortgage lender's survey information pack¹. It is inferred that the seller's pack is perceived by most of the interviewed householders to be credible.

These findings provide support for the theme credibility, particularly highlighting the importance of the accuracy of information and the information source in defining this credibility.

11.4 Methodology evaluation

11.4.1 Positive elements

The Woolwich automatically delivered the HER to all customers with the standard mortgage HomeFile, thus increasing the likelihood that the surveys reached households with differing levels of interest in the subject of EEHI. The mortgage lender's large customer base and coverage of all areas of England also meant that the surveys were likely to reach all types of households and in many different areas of the country, thus reducing likelihood of bias associated with householder type and regional factors. The postal questionnaire also has some advantages over the face-to-face interview technique, since it avoids the potential interviewer effects on the responses given and social desirability bias.

The multi-strategy approach was chosen for reasons of facilitation and complementarity. It is argued that this approach has offered a number of benefits. First, it has allowed both the researcher's and the participants' perspectives to be explored. Second, the quantification of some of the qualitative research findings has given a sense of the

¹ i.e. the HomeFile in the case of The Woolwich.

relative importance of identified qualitative themes and where appropriate, the generality of the phenomena described. Third, the qualitative research has helped to identify the possible factors influencing the quantitative results.

11.4.2 Limitations of the study

Two of the major limitations of this study are the possible biases associated with the phase 2 survey technique of the empirical research and with the sampling for phase 3. The sample of householders who responded to the phase 2 self-completion questionnaire is likely to have been more highly educated, wealthier and have a greater than average interest in the subject of domestic energy efficiency. Having said this, the spread of opinion, experience and levels of activity represented in the results do suggest that a variety of householder types, with differing levels of interest in the subject have responded (see appendix C). It is also reiterated that the response rate was as good (if not better) than expected considering the practical limitations. This response rate of almost 13% represents an improvement on the only known comparable studies in the UK, where response rates of only 3.5% (70 out of 2000) and 11.7% (35 out of only 300) were achieved (see Darby 2002; New Perspectives and BMRB International 2002).

Ideally this survey would have been carried out using a stratified sample of householders. Unfortunately this was not and will not be possible for an outside party due to the terms of the Data Protection Act. Only the Woolwich/Ekins themselves (or other HER provider) could carry out such a survey by making clear to mortgage customers at the outset that this would form part of the mortgage application process, simultaneously obtaining the necessary permission.

Although some statistical analysis has been carried out for the results of phase 2, these results should be treated with caution. It is suggested that further research should be carried out to confirm these results using a stratified sample. In particular, it has not been possible to measure the level of effectiveness of the HER due to a lack of control for the study. Clearly, if increased resources were available, it would be profitable to repeat the survey using a parallel control group in order to give a clearer indication of the effect that the HER has had on the intentions and subsequent energy efficiency home improvement activity of the householders in question.

The phase 3 sample of householders interviewed as a follow-up to the questionnaires clearly is not random. Putting aside the sampling technique itself, such a small sample could not in any case be representative of the population. The resulting data were

therefore intended to enrich the findings of phase 2 and to suggest directions for further research.

The target population for the study has been homeowner-occupiers. In order to ensure that the surveyed sample represented owner-occupiers only, a question should have been included to this effect in the initial questionnaire. Since this was not included it is possible that some of the interviewees were in fact landlords with a buy-to-let mortgage.

The questionnaire and follow-up survey were carried out prior to the completion of the literature review and hence the themes of the conceptual framework had not been defined. Had this conceptual framework been completed, the survey could have been designed to follow the themes more closely with the explicit aim of rigorously exploring their validity. As this was not the case, some of the themes have far less data to support them than others. However, it is argued that since the questionnaire was not guided by the conceptual framework, instead being purely exploratory, it has avoided the potential problem of leading the respondent to the desired answer. Therefore, where support has been found for each of the themes one can be relatively sure of the validity of the results.

11.4.3 Potential impact of personal biases and assumptions

The author acknowledges that her own values have had an impact on the gathering of data and the subsequent interpretation of findings. In the context of this study this is particularly relevant to the interpretation of qualitative data. She has taken a self-reflective approach with the aim of making explicit the biases that inevitably result from her own values. It is suggested that the primary influence on the research has been the author's belief in the value of lay knowledge and experience which has potentially resulted in a bias in favour of the 'everyday householder'. Given this belief, it is perhaps unsurprising that the author has arrived at the conclusion that a householder-centred approach should be taken in developing domestic energy efficiency programmes, in order increase effectiveness. Clearly this conclusion is not justified purely on the grounds of the author's own values. Through interviews with providers, a review of relevant literature and a survey of householders, an argument has been built to support this conclusion.

The resulting data have also informed the development of the conceptual framework, providing detail about the form that such an approach might take. However, it should be noted that the underlying belief in the value of lay knowledge informed the critical

framework used by the author to interpret the phase 1 provider accounts. The outline framework that resulted from this interpretation was therefore influenced by the researcher's own values. This outline framework guided the subsequent interpretation of relevant literature, which in turn guided the interpretation of the empirical research findings and the development of the conceptual framework.

11.5 Summary

The outcome of this study is a conceptual framework for the development of an information/advice programme to engage householders in energy efficient home improvement. This framework is founded on the hypothesis that an everyday householder-centred approach will improve the effectiveness of such programmes. Taking an iterative, theory-building approach, the characteristics of an everyday householder-centred programme have been outlined in terms of: the roles of the householder and the provider; the message content; the framing of the message; delivery and presentation methods. The final chapter will examine the proposed seller's pack home energy report programme in relation to each of these characteristics and make specific recommendations for its development.

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12. Conclusions and recommendations for further research

12.1 Chapter outline

The final chapter concludes with a series of recommendations for the improved effectiveness of the HER programme, based on an everyday householder-centred approach to programme design. These recommendations are drawn from an evaluation of the working draft versions of the HER proposed by DETR/ODPM to be used as part of the seller's pack programme. Suggestions for further research are made.

12.2 The development of the HER

Fewer than one third¹ of the respondents in the study stated that they thought the HER could be improved. However, the fact that householders also intended to install fewer than one third² of the measures recommended in the HER (and were likely to actually install even fewer³), suggests that there is potential to improve the report's effectiveness. While it appears that around half of the householders will install at least one of the energy efficiency measures recommended to them within the next year, the majority of these improvements are likely to be relatively ineffective in terms of absolute energy efficiency levels. Since the highly accessible energy efficient light bulb accounts for the majority of the adopted measures, one might also assume that some measures would have been installed regardless of the HER. The real question therefore becomes, 'how can householders be engaged in *more effective* energy efficient home improvement?'

Earlier in this work the notion of responsibility for 'the problem' was discussed. Previous studies had found the UK public unwilling to take personal responsibility for environmental improvement perceived to be beyond their own locality and unlinked to their own everyday actions. Many of the interviewed experts who provided domestic energy efficiency advice programmes appeared to align themselves with the techno-economic paradigm: householders themselves were seen as part of the problem, precisely because they were perceived to be unwilling to take responsibility for their actions and because of a general lack of interest in energy efficiency. An everyday

¹ 30.9% (\pm 5.9%; n=233, $p < 0.05$)

² 27.1% (\pm 5.7%; n=231, $p < 0.05$)

³ 15.3% to 23.4%

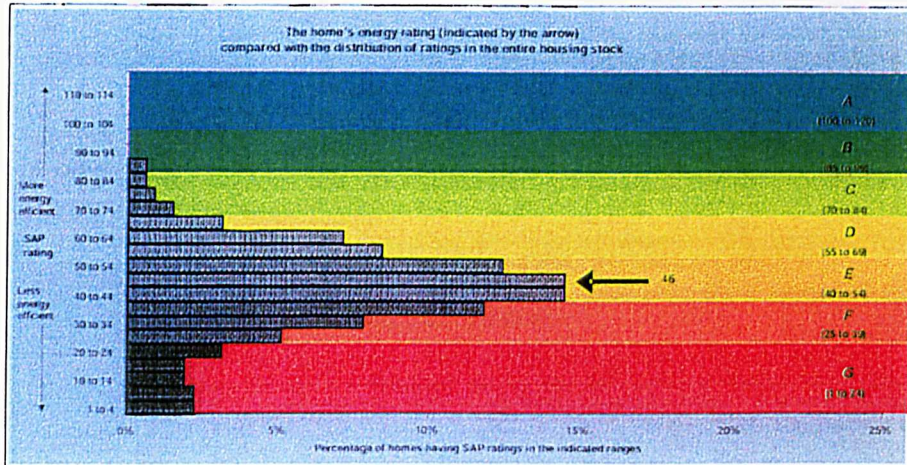
householder-centred approach turns this scenario on its head: **rather than being seen as the part of the problem, the everyday householder is seen as part of the solution.**

Since *all* domestic energy efficiency programmes for the existing private stock currently depend on the everyday householder, it is suggested that this is the *only* perspective that will result in a successful and sustainable approach to engaging householders in energy efficient home improvement. Programme success and sustainability therefore rests on engaging the householders' powerful **self-interested motivations**, building on their existing **energy knowledge**, and using their considerable **cognitive capacity** to better effect. In order to identify how this might be achieved, the seller's pack home energy report is examined in the context of the conceptual framework (see 12.2.1 – 12.2.2).

When this evaluation was first carried out, the HER developed by DETR during the Bristol pilot scheme was the most recent version available (figures 6-1 & 6-2). In March 2003 a modified 'working draft' version of the energy report was published by ODPM in the consultation document, *Reforming the buying and selling process in England and Wales: contents of the home information pack*. This version has now also been considered (see figures 12-1 – 12-3). The evaluation below therefore indicates both stages in the evaluation process and notes where positive or negative modifications appear to have been made in the light of the conceptual framework. The outcome of this process is a series of recommendations for the programme's development. These recommendations will form the basis of a response to the ODPM's consultation document.

Address
 Inspection Date

SECTION H



How energy efficient is this home?

- The Government's Standard Assessment Procedure (SAP) rates the energy efficiency of homes on a scale of 1 to 120, the higher the number the better. On this scale, this home has a rating of 46.
- The chart above shows where this rating lies within the distribution of SAP ratings for the entire housing stock.
- On a scale of A to G (A = very good, G = very poor) the home falls within Band E.
- There are a number of improvements that could be made to the energy efficiency of the dwelling, which could potentially raise the SAP rating into Band B on the chart above. These are discussed below. By making such improvements the homeowner could save money, improve comfort and reduce impact on the environment.

SECTION H (continued)

Current energy efficiency measures and possible improvements

This 1940s semi-detached home currently has the following energy efficiency measures:

- The loft is insulated to a depth of 50mm
- The hot water tank is insulated with a 50mm jacket
- The windows appear to be well draught proofed, but the windows themselves, which are only single glazed, are likely to need replacement within a few years, since the frames have deteriorated and they will probably be beyond economic repair
- There is a gas central heating system with basic controls (room thermostat and programmer), but the boiler is old and will need replacing shortly.

It is recommended that, in rough order of priority, the following energy efficiency improvements should be considered:

- Insulating the hot water tank using a jacket of at least 80mm thickness, and also insulating the heating pipe connections to the cylinder for about a metre or for as far as they are accessible.
- Installing a modern high-efficiency condensing boiler when replacing the current boiler *
- At the same time as replacing the boiler upgrading the controls to include a full programmer, room thermostat, cylinder thermostat, thermostatic radiator valves (TRVs), boiler interlock and automatic bypass valve *
- Insulating the cavity walls *
- Topping up the loft insulation to meet current standards (250mm)
- Replacing the existing single glazed windows (the thermal insulation performance of the replacement windows will have to comply with Part L (conservation of fuel and power) of the Building Regulations *

The table overleaf indicates the likely costs and savings for these improvements. It also shows the corresponding SAP rating improvements and typical carbon emission reductions.

* Replacement of boilers and windows and inserting insulation into wall cavities are categories of work subject to the building regulations. Homeowners can call the Energy Advice Centre for guidance – see "Further Information" below.

| Improvement | Typical costs | Typical savings over a 10 year period | SAP rating improvement | Reduction to carbon emissions from heating and hot water |
|--|---------------|---------------------------------------|------------------------|--|
| Hot water tank and pipe insulation | £ | £££ | 1.5 | 3.5% |
| Replacement of boiler with a condensing boiler* | £££££ | ££££ | 11 | 22% |
| Installation of a full heating controls package | £££ | £££££ | 4.5 | 8% |
| Cavity wall insulation | ££££ | £££££ | 12.5 | 17% |
| Loft insulation top up | £££ | £££ | 2.5 | 3% |
| Replacement of windows with Low-E double glazing** | £££££ | ££££ | 8.5 | 8.5 |
| * the extra cost relative to a non-condensing boiler compliant with the building regulations is much less than the indicated typical cost so this measure is actually very cost effective in a situation where the boiler has to be replaced | | | | |
| ** the replacement of windows is subject to building regulations. These effectively require the use of low-E double glazing (or equivalent), as this is a very cost-effective measure when the windows have to be replaced anyway. | | | | |

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Figure 12-2: working draft version of seller's pack Home Energy Report, March 2003, page 2.

SECTION H (continued)

Notes on the table

E signs are used in the table to indicate ranges of likely full costs for the measures and the savings that they might produce over a ten year period (all the measures can be expected to last for at least this long, and much longer in many cases). The more E signs the higher the costs (in red) or savings (in green):

- E – below £50
- EE – £50 to £150
- EEE – £150 to £300
- EEEE – £300 to £500
- EEEEE – over £500

Note that the figures in the table are based on standard assumptions about the way in which the home is occupied and heated and these may not correspond to your own circumstances. Consequently, the savings in practice could actually be either more or less than shown, but the ranges that are indicated are fairly typical.

Note also that the savings and SAP improvements from individual energy efficiency measures do depend to some extent on the order in which they are carried out. The figures quoted assume that the measures are undertaken in the order in which they appear in the table. This order is based on favouring the shortest payback periods, but taking account of the costs as well (i.e. if two measures have similar payback but one is less expensive than the other, then it is assumed that this one would be done first). But other practical considerations come into play as well so the order may not follow this exactly.

Further information

In addition to the specific measures recommended above, don't forget that there are many other no-cost and low-cost measures that will save money and help reduce impact on the environment. For example:

- Turning down the heating system thermostat by 1°C
- Making sure the hot water is not too hot (60°C is recommended)
- Fitting low energy lights, particularly in rooms with a heavy lighting use such as the living room
- Turning off lights and domestic appliances when not needed, and not leaving TVs, videos, etc on standby
- Not overfilling kettles and saucepans, and using a lid where possible

A nation-wide network of Government funded Energy Advice Centres offers further information and advice on energy efficiency. They can also tell homeowners about grants for energy efficiency improvements that may be available in their area. Homeowners can call them on 0800 512 012.

12.2.1 Recommendations⁴

The effectiveness of the HER programme will be improved if:

1. the report communicates a wider range of potential personal gains to be made from engaging in EEHI;
2. the report provides DIY in addition to professional installation costs;
3. direct links are made in the report to specific financial support schemes for EEHI;
4. detailed procedural information is supplied in the report, or further specific information sources identified;
5. financial savings are framed as avoided losses and avoided losses of heat are also communicated;
6. specific opportunities are offered to the householder as part of the programme to further explore and try-out EEHI;
7. the opportunity for householders to participate in and inform the advice process is increased;
8. EEHI measures are, where appropriate, framed as novel up-to-date products, which offer the convenience, comfort and positive health expected to maintain a good quality of life;
9. the report emphasises the specific impacts of the recommendations on everyday 'visible' experience of the home;
10. technical language and jargon are avoided and instead more familiar terms and frames of reference are used that are associated with everyday domestic life;

⁴ These recommendations could be read as hypotheses and the proposed conceptual framework tested on this basis, through further empirical study of the HER in use by everyday householders. In confirming or rejecting these hypotheses, so too would the developed theory be either confirmed or rejected.

11. figures (e.g. energy bills and payback times) are based on the household and dwelling in question rather than 'the average' household and dwelling;
12. the recommendations are tailored to the needs, aspirations and way-of-life of the specific household in question;
13. the report makes links between popular visible home improvements and energy efficiency measures explaining how and when these might be integrated;
14. the report is made more eye-catching and graphically clear;
15. the recommended measures are even more specific in nature;
16. the advice is humanised, e.g. being delivered by a locally known person such as a neighbour; by giving it a local identity; or by providing a video showing celebrities demonstrating how to carryout relevant energy efficient DIY home improvements;
17. the report is linked to more vivid demonstration techniques e.g. a computer programme showing the relationship between EEHI and energy consumption etc;
18. a specific, accessible advice service is offered as a follow-up to the initial report, permitting dialogue between the householder and the provider (or alternatively back-up material);
19. opportunity for feedback is built into the programme in order to reinforce the credibility of the information provided.

12.2.2 Programme evaluation

Self-interest

Personal gain/cost: The report format used in the seller's pack pilot highlights first, the opportunity to reduce fuel bills and second, the opportunity to reduce global warming. This suggests an emphasis on the rational-economic perspective, where the householder is conceived as a rational decision maker who weighs up the costs and benefits of the situation – these being primarily financial in this case. The financial

aspects of the decision are further emphasised by also showing the estimated costs of the recommended improvements and the associated payback period. In making a link to the environmental problem and CO₂ savings potential, there is a secondary appeal to the individual's altruism - whether that be socio- or eco-centric. However, it is also inferred that since the householder is expected to make personal gains from tackling 'the problem', they are also expected to take responsibility for solving it.

The framework suggests that the HER programme should look beyond financial gains and emphasise a wider range of potential personal gains to be made from engaging in EEHI. In addition, the associated costs (in terms of disruption, time required etc.) should be detailed so that they are not perceived by the householder to be so great. The most recent working draft report highlights first the opportunity to save money but it also refers to improving comfort and reducing impact on the environment. This is a positive modification. Personal costs (other than financial) again are not highlighted.

Affordability: The HER used in the pilot study provides the estimated costs of buying and installing the recommended measures professionally. The framework suggests that measures need to be perceived to be affordable if they are to be adopted. Hence it is proposed that the provision of DIY installation costs in addition to professional costs would help to ensure that more recommendations are perceived to be affordable.

The more recent version of the report instead provides estimates of the associated costs represented by pound signs, from £ - under £50 to £££££ - over £500. Although DIY costs are not specified, this could be viewed as a positive modification, reducing the likelihood that the householder will be put off by specific estimated figures which may prove to be inaccurate in particular circumstances.

There is clearly scope to link the HER to financial support schemes such as cash-back offers, low interest loans, grants etc. in order to improve affordability. Linking to schemes with lenders was proposed by one interviewee (DETR4), although the potential difficulty in getting people to borrow perceived 'awkward' amounts for energy efficiency improvements has been pointed out. Further research is required to identify appropriate and effective schemes. The Treasury's recent consultation on economic instruments to improve household energy efficiency (HM Treasury 2002) could form the basis of such future research.

Procedures: The home energy report itself only guides people through stages one and two of 'getting the message across' – raising awareness and gaining interest and providing information about a 'solution'. It has the advantage that it is proactive in these stages, providing relevant information whether or not people seek it. However, little procedural information is provided to facilitate action in either version of the report. In fact, there is less procedural information in the working draft report than there is in the earlier pilot version. Instead a note sign-posts householders to the government funded Energy Advice Centres for further information and advice. Since there is no link between the information provided and a specific programme of action (e.g. an installation scheme run by the Local Authority), neither do the reports provide access to an opportunity to pursue energy efficient home improvement.

Examining the HER programme in the context of the conceptual framework it is proposed that further procedural information should be provided relating to each specific recommendation. This information should reduce the likelihood that householders have feelings of helplessness and thus avoid EEHI altogether. A clear hierarchy of information -using graphical techniques and signposting to other information sources - will be required to ensure that an overload of information is avoided.

Exploration: The pilot report offers little support for further exploration of the issues raised. The conceptual framework implies that householders will be motivated to explore EEHI further and that support for this exploration might render the programme more effective. This support might be offered in the form of further contacts for advice or in specific opportunities to gather further information, explore ideas or try-out home improvement activities that are linked to the report itself.

As noted above, the working draft report includes contact details for the government funded Energy Advice Centres. This at least provides a starting point for further exploration of the issues, although more guidance could be offered at this initial stage.

Efficacy: The piloted report does indicate to the householders how effective their recommended home improvement activity will be in terms of estimated SAP rating increase, annual heating cost reduction and also annual CO₂ emissions reduction. This information might potentially engage the householder's innate motivations for competence and for making a difference. However, householder feedback suggests that there is potential to provide further evidence to support the efficacy of EEHI

through the communication of SAP rating increases and reductions in CO₂ output for each individual recommendation. This information has in fact been provided in the most recent working draft report. The potential for 'helping the environment' is also made explicit in the explanatory text on the back of the pilot report and in the working draft this information is perhaps more prominent, being within the main text on the front page. Since the theme efficacy also encompasses the motivation for frugality, the framework suggests that potential savings should be re-framed as avoided wastage or loss in order to increase the motivational power of the message.

Participation: By offering an energy rating and recommendations for action, the energy report can inform householder decisions. This potentially gives the householder more control over the process of engaging in EEHI and, in giving a number of home improvement options, a degree of choice is offered. Therefore, examining both versions of the report, the HER programme appears to be founded on an acceptance that the homeowner has ultimate power in determining its effectiveness. However, on the level of actually devising the advice, the provider retains all control, drawing only on expert knowledge. Rather than allowing householder knowledge to inform the advice, the programme looks only to the dwelling for input. This could have implications on the perceived relevance and accessibility of the advice.

The framework implies that the HER programme should offer the householder a greater degree of participation and hence a greater sense of choice and control. One means to achieve this would be to allow the householder to provide information that informs the initial HER. However, since the seller's pack is to be provided for all potential purchasers of a particular dwelling, this approach is not feasible. Instead it is proposed that a follow-up advice session permitting such participation after the completion of the dwelling purchase should be linked to the initial HER (see follow-up below).

Luxury: Little (if anything) is currently made of the opportunity to motivate through the luxury aspect of energy efficiency. There is no explicit reference in either report to increased convenience or the new and novel aspects of the recommended measures. It is suggested that the HER takes the opportunity to frame energy efficiency measures such as heating systems etc. as measures which offer convenience, which are up-to-date and, where appropriate, novel. These qualities might also be reinforced through integration of energy efficiency measures with the standard home improvements already perceived by householders to offer such luxury.

12.2.3 Energy knowledge

Visibility: The pilot HER attempts to make energy and energy efficiency more visible by providing a comparison of actual and potential energy ratings for the home and by estimating heating costs and CO₂ emissions before and after recommended home improvements. The working draft does not include estimated total fuel costs or CO₂ emissions, but similarly indicates the current SAP rating and SAP band that might be achieved. Also, as outlined above, it gives SAP rating improvements and reductions in CO₂ emissions for individual measures. In neither report, however, is there much reference to the tangible, specific impacts of the recommendations on everyday life as perceived by everyday householders. It is suggested that the 'visible' everyday impacts be emphasised and detailed for each recommended measure within the report in order to render the message more meaningful to householders.

Quality of life: Just as there is little reference to the effects of energy efficiency on everyday life, little is made of the opportunity to reassure householders that energy efficiency can provide expected (or better) quality of life standards; especially standards of comfort, convenience and health. Although the working draft has been positively modified, with a reference to comfort on the first page, it is proposed that, wherever possible, the links between quality of life standards and recommended energy efficiency measures be reinforced to encourage EEHI.

Familiarity: The language used in the report is relatively accessible, however, some of the most prominent information presented in both reports refers to SAP ratings and CO₂ emissions (changed to carbon emission in the working draft). These terms represent the technical language of the expert and reflect the expert's rather than the householder's energy knowledge. Although the pilot report included a brief explanation of the significance of carbon dioxide emission, the working draft includes no explanation about the significance of CO₂. SAP in particular is unfamiliar to householders and it was shown in both the pilot study and also in the study presented here that it was not generally well understood. The SAP rating, and the potential to improve this, is intended to play an important role in motivating action. If this kind of approach is to be taken it is important that a more accessible energy rating system be used. Some attempt towards this has been made in the second generation of the report used by DETR for the pilot study, with bands from very poor to excellent. Following the first stage of this evaluation the author suggested that this needs to be taken further, for example, by using the more familiar system used for white goods. The working draft report has in fact introduced SAP bands from A to G, comparable to the latter system.

This should aid understanding of the rating scale. Also helpful is the explanation that the SAP scale in fact runs from 1 to 120. The initial rating scale of 1 to 100 had contributed to confusion.

It is noticeable that there is no attempt to translate the benefits of improved energy efficiency into familiar concepts associated with everyday life and everyday understanding of energy. The framework suggests that this approach would improve the effectiveness of the programme.

Personalisation: The DETR interviewee (DETR 3) spoke of the potential to make the recommendations in the report better tailored to the specific circumstances of the household. If this were the case then there would be potential to ensure that the report recommendations were personalised to the needs, aspirations, way-of-life and quality of life standards expected by the recipients, thus making advice more relevant. However, while there is no consideration of these aspects within the data gathering/consultation stage of the process, advisors cannot seize this potential. As currently proposed, the writer of the report bases advice only on the dwelling and it appears that there would be insufficient finances and resources available to permit necessary householder input. The plan to include the report in the seller's pack itself poses a problem in this respect, since the report will be made available to all potential buyers of a specific property, rather than to one specific household. Hence it will need to accommodate all potential buyers. As in the case of participation, the framework therefore implies that a follow-up advice service is necessary to enable the personalisation of advice to the householder in question. It is suggested that this would improve the effectiveness of the programme in engaging householders in EEHI.

Self-identity: Most EEHIs are not visible in the home and hence unlikely to be symbols of status and self-identity. However there is potential to integrate energy efficiency into the popular visible home improvements that homeowners consider to be worth the investment. The report in its pilot and working draft formats makes no links of this kind, treating the recommendations in isolation from other aspects of home improvement. The framework therefore suggests that specific opportunities to incorporate energy efficiency measures into the most popular home improvements should be highlighted in the report. The proposed follow-up advice session would permit exploration of more specialised alternatives.

Other personally negotiated self-identities (such as green person, caring person) suggest that there is potential to reinforce such identities and engage people in EEHI by these means. While there may be some scope to achieve this in the report, it is perhaps more appropriate to explore these opportunities on an individual household level, again supporting the proposed need for greater householder participation through follow-up advice.

12.2.4 Cognitive capacity

Vividness: The presentation of both reports is not particularly eye-catching, but some attempt has been made graphically to give certain areas a separate identity. In the case of the pilot report there is a hierarchy of information with the front page essentially providing the headlines and the back page providing more detailed explanatory text. This clarity is lacking in the current working draft report. Where the pilot included a simple SAP band diagram, the latter report has made the diagram much more complex and it negates to indicate the potential SAP rating. Although more information is provided in this diagram it is suggested that its complexity could be intimidating for many householders, leading to feelings of helplessness and thus avoidance. It is proposed that in general the vividness of the presentation could be improved in order to make it more likely that the information is perceived, understood and then remembered. Simpler diagrams and images linked to text could help.

Specificity: The reports offer specific recommendations for the improvement of energy efficiency, however, feedback suggests that even greater specificity would increase the likelihood that householders will act on the advice. In particular the HER should provide greater detail about each of the recommended measures and should be based on an accurate picture of the dwelling in question.

Humanisation: The reports come from an anonymous advisor and have no local identity, or association with known valued individuals. Potential to improve the report's effectiveness is therefore missed, though the intended national standardised approach is unlikely to permit such humanisation.

Demonstration: For those who value an authoritative piece of paper, the energy report provides the proof that action will be 'worth it'. In effect the computer programme that has produced these reports has demonstrated the effects - financial and in terms of CO₂/carbon and SAP rating - that adopting these EEHIs will have. The authority of this demonstration relies on the credibility of the source (see 'Credibility' below).

Householder feedback suggests that the report's own demonstration technique should be improved by including the increase in SAP rating and reduction in CO₂/carbon output for each recommendation. As noted above, the working draft does include this modification. In addition, the report could be linked to more vivid demonstration techniques, for example, computer software showing the relationship between EEHI and energy consumption etc.

Opportunism: Since the information is provided when householders are considering moving home, it is expected that many people will engage in home improvement shortly after receiving the report. The programme therefore expects many people to already be considering action and know where to find information about implementation. In essence, the timing of the report offers an opportunity to raise awareness and generate interest and provide information about 'solutions' at a time when people might already be considering taking action. However, householder feedback suggests that there are different times and places considered to be opportunistic by different householders according to their circumstances. Follow-up advice would provide a means to address this issue offering an alternative opportunity to receive advice.

Follow-up: The idea of providing a follow-up advice service through LEACS or Local Authorities, as outlined by a DETR interviewee could offer a means to provide procedural information, support for exploration, participation and alternative opportunities for advice. However, as the pilot HER was conceived there was no opportunity to prompt the householder or provide further information down the line, since there was only one instance of information provision and no back-up material. The framework suggests that in order to improve the effectiveness of the scheme it is important to provide such an opportunity for follow-up advice and to make clear links to this service in the initial HER. Since the working draft report includes contact details for the Energy Advice Centres, follow-up advice might actually be provided, so long as the householder in question is proactive. Preliminary householder feedback suggests that a service in major DIY stores might also be appropriate, providing a potentially more visible and accessible source of information and advice.

Credibility: Results have highlighted the potential for the credibility of the SAP rating system to be called into question by the householder due to unfamiliarity and lack of understanding. This could in turn jeopardise the credibility of the whole scheme. Suggestions for addressing this problem have been made above. In its current format

this programme offers no opportunity to reinforce the credibility of the message using feedback. Ideally, access to feedback should be built into the programme to, in effect, prove that the recommendations are effective and hence promote further EEHI.

The scheme, as conceived, would be Government-backed and the reports provided by Government-approved energy rating companies. This will potentially offer credibility. Although the literature suggested that this cannot be relied upon, preliminary results suggest that the Government is no less credible a source of information than an independent energy advisor, as perceived by householders. Further research is needed to confirm this finding. It is suggested that the use of one report format nationally will increase the credibility of the scheme and ensure messages are consistent. The seller's pack does indeed appear to be more popular than the alternative mortgage lender approach to HER delivery, suggesting that the consistency of the former approach might be attractive to the householder. It is therefore proposed that the HER programme should be developed as a national Government-backed programme with the initial report being delivered as part of the seller's pack (i.e. as proposed by ODPM).

12.3 Final conclusions

An evaluation of the seller's pack HER, based on the developed conceptual framework, suggests that the programme has a number of strengths. These strengths suggest that the programme is worth pursuing and might potentially be effective in engaging owner-occupiers in EEHI. However, in the light of the developed conceptual framework it is also clear that there are many weaknesses.

The HER as currently conceived is clearly a function of the techno-economic paradigm. The programme is founded on an assumption that the transfer of technology from the expert domain to the non-expert domain is possible. Similarly it is assumed that it is conceptually possible to transfer information ('the message') from one domain to the other to support the application of the prescribed technical solution. It is suggested that in fact this paradigm and its assumptions have dominated all major government-funded energy efficiency programmes in the UK since their emergence in the 1970s. To continue along this route might bring gradual improvements to domestic energy efficiency levels as it has done in the past. However, in order to meet the demanding targets that appear to be necessary (RCEP 2000) a radical re-think is required: programme designers cannot go on operating within the constraints of the techno-economic paradigm.

Nothing has emerged in the results of this study to suggest that the HER programme represents this radical re-think. Although there are positive elements, such as the proactive and opportunistic nature of report's delivery, the programme as a whole still relies on a linear process of technology transfer in which the householder is expected to apply the solution that has been conceived in the isolation of the expert domain. The findings suggest that there *will be* positive results – some householders will apply the recommended 'solutions'. However, there is nothing to suggest that the HER will be effective in engaging a majority of householders in applying the most effective measures. This, ultimately, is what is required.

The techno-economic explanation for the apparently low overall rate of take-up would be that the householders must have imperfect knowledge: if they knew the facts they would act in accordance with these. This study suggests that the facts as presented are insufficient: people are multiply motivated and hence an array of factors needs to become part of the domain of energy efficiency. Energy efficiency programmes should not be isolated from these 'everyday' factors, because they rely on everyday people to implement the 'solution'. It is proposed that the 'solution' itself as currently prescribed by the technical expert, is not in fact appropriate for the everyday world since the solution is conceived within (and is hence effectively for) a techno-economic world. The techno-economic paradigm and its resulting solutions must be challenged through the substitution of the linear approach. The methodology adopted in this study represents such a challenge, by both representing and also informing an alternative non-linear approach in which the householder provides input alongside the expert.

The findings have provided insight into the multiple factors that influence the householders' decision-making processes. By working *with* the traits of the everyday householder, the value of energy efficient home improvement might be perceived in a number of different ways. This is not to discount the role of the expert, only to inform it. In this way the householder can become part of the solution to the problem of climate change, with relevant responsibility lying with both institutions and also individuals. The UK Government's focus on economic instruments to improve energy efficiency is positive; evidence of the need for such instruments to enable householders to act has been found in this study. However, again, this initiative does not represent a diversion from the dominant paradigm. Results show that the promise of financial gain alone is not necessarily sufficient: householders first need to be *engaged*.

While the seller's pack HER programme has emerged as a positive step towards engaging owner-occupiers in action to improve the energy efficiency of their homes, it is only a first step. If the Government is to introduce this programme much more needs to be made of its potential to be centred on the everyday householder. It is suggested that it should be reconceived within an everyday paradigm in order to increase its effectiveness in the everyday domain. The recommendations that have been made begin to show how this could be achieved, having implications for the design of the report itself and also for the environment in which energy efficiency advice is explored and implemented.

The findings suggest that first and foremost it is important to enable householders to participate in defining an energy efficiency solution for their own situation. This is fundamentally different to the proposed HER approach. Participation, to a greater or lesser degree, will be the only vehicle for tailoring energy efficiency advice to the individual needs and aspirations of householders. Such personalisation will itself render advice more effective, since it will be more relevant to the recipients' and their circumstances. There is evidence that much of the advice offered was not perceived to be relevant by the surveyed householders. In some cases it was simply incorrect. It is clear that the accuracy of advice programmes is fundamental to their credibility and hence their success. Accuracy can rest upon the ability of the assessor to input information correctly, the design of the assessment tool itself, or the accessibility of facts. Through householder participation, the expert will be afforded a greater degree of access to the facts and a wider range of knowledge.

Many of the surveyed householders would have preferred to receive more detailed information about the measures recommended to them and more information about exactly how to implement the advice. It is important that energy advice programmes either directly provide procedural information and support, or provide a clear route to these, in order to enable householders to take positive action. Only in this way will the powerful motivation for competence be engaged. The findings suggest that many householders would be motivated to explore EEHI in more depth. In order to support this, accessible literature and other media should be made readily available in a mainstream environment.

A number of different times and situations have been highlighted in which energy advice might prove opportunistic: on moving home; getting planning permission; doing DIY; when money becomes available; when children leave home. Domestic energy

efficiency should not rely on any single opportunity. Instead advice and support mechanisms should be devised for an array of times and situations to increase the likelihood that action will be taken. The form that this advice takes is an important factor in how it is received. A paper report has the advantage that it can be studied at an individual pace, kept and referred to at the householder's convenience. However, other potentially more vivid media and delivery mechanisms exist, such as video and both computer and physical demonstration models. The suitability of the approach will clearly depend in part on the context in which it is being delivered.

One broad approach is highlighted as having great potential: integration. There is clearly scope to integrate energy efficiency into the highly popular standard home improvement activity that is carried out by millions of householders in the UK every year. This is likely to demand follow-up advice and support. This also has implications for the training of a new type of advisor, i.e. those who come into contact with the householder through the process of home improvement. Those surveyed suggested that surveyors, architects, installers, builders, DIY experts and council housing officers might all provide a credible source of advice in addition to recognised energy advisors. Taking the householders' aspirations for their home as a starting point would offer such advisors an opportunity to forge links between valued visible home improvements and energy efficiency. These observations suggest a need to embed energy advice in the infrastructure of domestic refurbishment. This process would itself represent a means to render energy efficiency measures and their effects more 'visible'.

The fact that the most familiar products have also proved to be the most popular in terms of take-up has implications for where products are sold and how they are marketed. The mainstream marketing of energy efficiency as a series of products, as opposed to a behaviour (as in the case of the 'Doing Your Bit' campaign), could have a positive impact on visibility, familiarity and hence take-up.

The importance of this research lies not only in informing the development of the forthcoming seller's pack HER programme, but also in informing, more broadly, domestic energy efficiency policy for the UK. In particular, the recommendations infer a need for policy makers to re-examine the assessment tools used to define solutions and generate information and advice. Since these tools are themselves a function of the techno-economic paradigm, they currently provide no space for input by and about the household itself; about the factors which influence the decision-making processes of the individuals who live or who will live in the home. Whether these tools are

redesigned to allow such input or whether they are paired with complementary 'tools' and support mechanisms, a paradigm shift will first be required among policy makers. From this viewpoint the primary barrier to domestic energy efficiency is no longer the householder, but the policymaker.

There is a need to re-examine policy in the light of these findings; to ask whether or not the potential to effect change is being constrained by the techno-economic view. This thesis would support the view that it is indeed being constrained and that the home energy report could be the first in a long line of programmes to benefit from such a re-examination.

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