



ACE

The Association for the Conservation of Energy

Affordable Warmth in 'Hard to Heat' Homes: finding a way forward



The Association for the Conservation of Energy

Westgate House, Prebend Street, London N1 8PT
Tel: +44 20 7359 8000, Fax: +44 20 7359 0863
Website: <http://www.ukace.org>

Affordable warmth for 'hard to heat' homes: finding a way forward

Jacky Pett, Association for the Conservation of Energy
March 2002



Association for the
Conservation of Energy

EXECUTIVE SUMMARY

1. This report explores the issue of 'hard to heat' homes, the extent of the problem they pose, and the potential solutions that may be offered.
2. Homes are potentially 'hard to heat' if they are of solid wall or non-traditional construction (i.e. non-cavity wall), or have no access to mains gas. There are approximately 3 million homes off the gas network. An estimated 36% of the UK's 24.5 million dwellings are of non-cavity wall construction.
3. Non-cavity wall homes tend to have low energy ratings, measured through SAP or NHER rating systems. A solid wall home with minimal loft insulation, double glazing and electric storage radiators would have a SAP rating of 24. Substituting gas central heating for the electric system raises the SAP rating to 39. Providing a full insulation package to both walls and loft, but retaining the electric heating system raises the SAP from 24 to 49, just above the UK average. Installing both gas central heating and insulation measures raises the SAP to 67.
4. Fuel poverty is generally defined by describing those who need to spend more than 10% of their household disposable income on maintaining an adequate temperature in the dwelling as 'fuel poor'. There are around 5 million households in fuel poverty in the UK (2000 estimates). Extrapolating from the known statistics of fuel poor in housing built before 1919, there are over 2 million households in non-cavity wall homes. This is 44% of those categorised as fuel poor.
5. Large numbers of people classified as "vulnerable" live in hard to heat dwellings. 259,000 long term sick or disabled, 664,000 elderly households and 770,000 households with infants live in non-cavity dwellings, although there may be some overlap within these categories. Of the latter two groups, over two-thirds are owner-occupiers, which provides a greater challenge in getting them to take up energy efficiency measures.
6. There is increasing awareness that policies addressing climate change, energy, health and sustainability overlap in their objectives, and that strategies for one may impact on strategies for another. For example, the UK Fuel Poverty Strategy relies heavily on policies introduced for social and environmental issues such as poor housing and mitigation of climate change. Key policy mechanisms for addressing fuel poverty include Warm Front, EEC, HECA and Decent Homes. Measures under Warm Front and EEC are constrained by cost limitations, the first in place as grant maxima, the second by the concept of cost-effectiveness. Health issues are increasingly being integrated into community solutions through Health Improvement Programmes, which have been enabled through the Health Act 2000, and Health Action Zones.
7. Whilst the mechanisms are in place, the costs of measures to address hard to heat homes cause barriers. The costs vary from property to property. Preparation and finishing add substantially to the relatively low cost of wall insulation. For properties grouped in an estate, economies of scale lead to estimates of £3,000 for external insulation of terrace houses, £3,500 to £5,000 for other types. Internal wall insulation costs on average £1500. Installation of gas central heating typically costs around £2,000, with the marginal cost of gas condensing boilers being allowable for grant funding under Warm Front. External insulation included as part of a general refurbishment programme is cost-effective at approximately £1000 (marginal cost). Domestic solar water heating is possibly a cost effective option for those off the gas network.
8. The Warm Front and EEC mechanisms described above form a basis for work improving the energy efficiency of the UK housing stock. Much work has been and is being done by various actors including local authorities, housing associations, energy advice providers,

energy consultants, NGOs and programmes promoted by DEFRA (and formerly DETR) through the Energy Saving Trust and others. The problem facing these agencies is access to funding and conflicting priorities. Improving cavity wall homes is easier to do and requires less finance, but still faces resistance from home-owners and local priority setters. So far only approximately one third of cavity wall homes have been insulated. Projects and programmes are being carried out to develop understanding of best methods and frameworks for addressing hard to heat homes once all cavity wall housing has been improved. Routes for dissemination of this work include the EST's Practical Help website, the Housing Corporation Innovation and Good Practice website, and databases under construction.

9. A large amount of further work has been identified in order to develop understanding, finance and market take-up. These can be generally categorised as audience analysis, benefits, grants and incentives, industry development, skills and standards, advice, attitudes and education, policy and research. These have been developed into a work programme comprising four major strands:
 - Marketing: including analysis of grants and incentives and market analysis, leading to a strategy for different audiences.
 - Lifecycle benefits: a robust cost benefit analysis to inform policy and funding programmes. This is seen as essential work in improving the case to Government for addressing hard to heat homes.
 - Best practice dissemination: to translate existing and developing best practice into standard practice. Underlying this needs to be ongoing research into refurbishment of dwellings for a low carbon future.
 - Skills and Standards: development of understanding of the role of energy and energy efficiency in a wide range of professions and raising the profile of and ability to deliver quality workmanship.
10. The work strands presented are needed to address the infrastructure and set the conditions for solving the problem. This will be through application of technical solutions that have been subsidised either through well-founded research and policy measures or through improvement in market conditions such that a sustainable industry develops. The wider problem is addressing individual householders, an issue which will require a step change in achieving market take up, and where regulation may be essential. The proposed "Sellers Pack" or published energy rating for homes, supported by the draft Buildings Directive, provides the regulatory incentive for home owners, but the solutions need to be developed to be easily adopted for installation through retail-type channels. The figures estimated through this project show that the market is there, but it does not understand the need. The work programme suggested in this project would begin to address that understanding.
11. Addressing the issue of affordable warmth in hard to heat homes is a long term project. The more we delay, the longer it will take to reach a solution, unless conditions become so bad that the quickest and cheapest solution is to demolish all houses below the acceptable standard. The threefold drivers of fuel poverty, climate change and health will surely prevent such a long delay.

CONTENTS

1	INTRODUCTION.....	1
2	PROJECT METHODOLOGY.....	3
3	HARD TO HEAT HOMES	4
3.1	SOLID WALL DWELLINGS	4
3.2	FUEL POVERTY.....	6
3.3	POLICY ISSUES	9
3.3.1	<i>Warm Front and EEC</i>	9
3.3.2	<i>HECA</i>	10
3.3.3	<i>Energy Policy</i>	10
3.3.4	<i>Housing</i>	10
3.3.5	<i>Health</i>	11
3.3.6	<i>Sustainable Development</i>	11
3.4	COSTS.....	11
4	RECENT AND CURRENT RELATED WORK.....	13
5	AREAS FOR FURTHER WORK	17
6	RECOMMENDED WORK PROGRAMME.....	23
7	SUMMARY AND CONCLUSIONS	26

FIGURES AND TABLES

FIGURE 1:	SOLID WALL DWELLINGS WITHIN TOTAL FOR ENGLAND.....	5
FIGURE 2:	HOUSEHOLDS IN FUEL POVERTY IN PRE- 1919 DWELLINGS, % OF INCOME SPENT ON FUEL.....	7
FIGURE 3:	DISADVANTAGED AND VULNERABLE HOUSEHOLDS IN SOLID WALL DWELLINGS, ENGLAND 1996.....	8
FIGURE 4:	PROPOSED WORK PROGRAMME	24
TABLE 1:	ESTIMATED NUMBERS AND PERCENTAGES OF NON-CAVITY WALL DWELLINGS IN UK 2000	4
TABLE 2:	COMPARISON OF SAP & CO ₂ RATINGS FOR SOLID WALL & CAVITY WALL END OF TERRACE HOUSE.....	6

LIST OF ABBREVIATIONS

ACE	Association for the Conservation of Energy
BRE	Building Research Establishment
CHP	Combined Heat and Power
CIBSE	Chartered Institute of Building Services Engineers
CO ₂	Carbon Dioxide
CPD	Continuous Professional Development
CSE	Centre for Sustainable Energy
DEFRA	Department of Environment, Food and Rural Affairs
DIY	Do It Yourself
DoH	Department of Health
DTI	Department of Trade and Industry
DTLR	Department for Transport, Local Government and the Regions
EAGA CT	EAGA Charitable Trust
EEAC	Energy Efficiency Advice Centre
EEC	Energy Efficiency Commitment
EEPH	Energy Efficiency Partnership for Homes
EESoP	Energy Efficiency Standard of Performance, superseded by EEC
EHCS	English House Condition Survey
EST	Energy Saving Trust
GP	General Practitioner
HA	Housing Association
HAZ	Health Action Zone
HECA	Home Energy Conservation Act
HECAAction	A programme for Local Authority Home Energy efficiency projects run by EST
HEES	Home Energy Efficiency Scheme, now known as Warm Front
HimP	Health Improvement Programme
IGP	Innovation and Good Practice programme run by the Housing Corporation
INCA	Insulated Render & Cladding Association
LA	Local Authority
NEA	National Energy Action
NGO	Non-Governmental Organisation
NHER	National Home Energy Rating
NIHE	Northern Ireland Housing Executive
NVQ	National Vocational Qualification
PCT	Primary Care Trust
PHA	Penwith Housing Association
PIP	Projects in Partnership
PIU	Policy and Innovation Unit, a department of the Cabinet Office
PR	Press or Public Relations
R&D	Research and development
SAP	Standard Assessment Procedure
SAVE	A European funded programme for energy efficiency policy research
SEDBUK	Standards of Efficiency for Domestic Boilers in the UK
SHCS	Scottish House Condition Survey

1 INTRODUCTION

This report explores the issue of ‘hard to heat’ homes, the extent of the problem they pose, and the potential solutions which may be offered.

It is the culmination of research followed by consultation within a workshop setting, and further investigation of information arising from these activities. It summarises the current state of knowledge on ‘hard-to-heat’ properties and offers a way forward: recommendations for a combination of policy activity based on the current state of knowledge and further research where needed.

“Hard to heat homes” are generally considered to be of three types: those of solid wall construction, those of non-traditional construction and those with no access to mains gas. In 2001, it is estimated¹ that there are approximately 3m homes without mains gas, mainly in Scotland and Wales, and in the South West and Eastern English Regions. Some of these are also of less energy efficient construction types such as solid walls and non-traditional, others will be cavity wall construction – there are no reliable estimates of the percentage of types of houses off the gas network. The figures for solid walls and other construction can be estimated from the development of typical building construction supported by the changes to the Building Regulations. Cavity walls (with a significant cavity, as opposed to “dual leaves”) were introduced in the mid-1930s and became mandatory in the 1965 revision to the Building Regulations. Making some assumptions about the rate of introduction of cavity walls and working from a variety of sources (shown in section 3), 36% of the total 24.5m dwellings in the UK are of “hard to heat” types.

Thus the chance that households living in these homes have to spend more than 10% of their income to maintain acceptable indoor temperatures (and hence be defined as fuel poor) is greatly increased.

Affordable warmth in hard to heat homes has implications for three key policy areas:

- Fuel Poverty
- Health
- Climate Change

It is unlikely that Government can achieve its policy targets without addressing hard to heat homes, yet most schemes currently in place do not address them because the solutions are deemed to be “not cost-effective”. Already during the course of this investigation this approach has started to weaken; the maximum grant for work under Warm Front² has been increased to £2000 which may allow some more far-reaching measures to be adopted.

It has emerged during this project that most of the technical solutions are known, the problems are perceived to be lack of money, lack of urgency, lack of co-ordination and lack of understanding of the issue, not least by those who live in hard to heat homes. This report aims to address these problems, including identification of how different actors can develop a coherent approach, and provide a strategy for solving the problem of affordable warmth in hard to heat homes. It starts with an overview of the project methodology, followed by a review of the size and scope of the problem of hard to heat homes. This includes the relationship with fuel poverty, and the implications for fuel poverty strategy, health strategy and for climate change targets. There follows a review of recent and current work on the issue of hard to heat homes and fuel poverty that is related to this project, then a discussion of the

¹ Transco website and conversation with Ofgem 29/01/02

² the former Home Energy Efficiency Scheme (HEES) is now known as Warm Front, this name has been used throughout

work proposed through the workshop and consultation. The priorities identified for this work have been assessed and drawn into a proposed strategy and work programme, identifying where existing programmes by other actors may take the issue forward, or may inform a further programme, and where gaps occur that need to be addressed. This is followed by a summary and conclusion.

2 PROJECT METHODOLOGY

The first stage was to produce a briefing note³ highlighting the present state of knowledge about solid wall properties, the extent to which they are occupied by households vulnerable to fuel poverty, and the cost of improving the energy efficiency of the dwellings. This paper was circulated to a number of potential delegates and other interested parties as background to a workshop designed to address the problem further.

The workshop took place on Thursday 13th December 2001 at the Institute of Energy in London. It was attended by 22 delegates plus two EAGA CT representatives and three ACE personnel. The delegates represented the following stakeholder groups:

- BRE
- CIBSE
- Energy Advice Centres
- Energy consultancies and NGOs
- Energy suppliers
- Government departments and non-government publicly funded bodies
- Housing Associations
- Insulation manufacturers and installers
- Local Authorities

The workshop opened with a presentation on the problem of hard to heat homes looking especially at solid wall homes, fuel poverty statistics and their relationships. This extended the work from the briefing paper to incorporate information from the Fuel Poverty Strategy⁴ which was published on November 23rd 2001, from research work by NEA⁵ and modelling based on the Scottish House Condition Survey⁶.

The main part of the workshop was devoted to exploring issues under four headings:

- Technical
- Promotion
- Infrastructure
- Finance

The output from each topic was reported on in an Initial Report⁷, classified according to one of 12 subject groups. These subject groups were proposed as a basis for further analysis into recommendations for priorities and programmes, and circulated for comment to the delegates, to a wider set of interested parties, and to the EAGA CT Trustees. The subject groups have subsequently been reduced to nine in number.

This report is the output from the whole project, including the outputs from the workshop, the consultation response and appropriate further research.

³ Pett, J; "Affordable Warmth in Hard to Heat Homes; a Briefing Paper" ACE and EAGA Charitable Trust November 2001. Available from www.ukace.org

⁴ DEFRA/DTI, "The UK Fuel Poverty Strategy" DTI November 2001.

⁵ Merleau-Ponty, N; Presentation at the NEA London Fuel Poverty Forum 29th November 2001

⁶ Macintyre C, Cormack D, O'Sullivan T and Martin C, "Fuel Poverty in Scotland: Analysis of the Scottish House Condition Survey 1996". www.shcs.gov.uk/files/FPOV1996.pdf

⁷ Pett, J; "Affordable Warmth in Hard to Heat Homes; Initial Report" ACE and EAGA Charitable Trust January 2002. Available from www.ukace.org

3 HARD TO HEAT HOMES

3.1 Solid wall dwellings

There are no hard data for the number of hard to heat dwellings in the UK. In England and Wales, cavity walls became common in the mid 1930s, and effectively became mandatory after the introduction of the 1965 Building Regulations. In Scotland, the thermal efficiency of housing was increased to a similar standard in 1965, but timber frame housing is more common than cavity wall housing. In this analysis of hard to heat homes, modern timber frame housing has been counted as if it is cavity wall. The figures used are from either the Scottish Housing Green Paper or from the Scottish House Condition Survey. In Northern Ireland separate regulations apply, and the Northern Ireland Housing Executive (NIHE) supplied information on the housing stock.

Table 1 shows the numbers of non-cavity walls in each of the home nations, with the English figures estimated from the English House Condition Survey 1996 (EHCS). Overlapping this 8.9 million, some 3.5 million are estimated to be outside the gas transmission network in England, Scotland and Wales. Many but not all of these are non-cavity wall dwellings. For the purposes of this report, the total number of hard to heat homes is taken to be equivalent to non-cavity wall homes, although the total number is probably between 10 and 12 million.

Table 1: Estimated Numbers and Percentages of non-cavity wall dwellings in UK 2000

<i>Country</i>	<i>Total Dwellings</i>	<i>Est. Non-cavity Walls</i>	<i>Non-cw % of total</i>
<i>England⁸</i>	20,371,000	7,274,000	36
<i>Scotland⁹</i>	2,250,000	900,000	40
<i>Wales¹⁰</i>	1,265,000	569,250	45
<i>N. Ireland¹¹</i>	650,000	170,000	26
UK	24,536,000	8,913,250	36

Non-cavity walls covers solid walls of various thicknesses, traditional timber and half timber frame houses built before 1944 and non-traditional forms of construction, including “no fines”, a method of constructing concrete panel houses pouring the concrete into frames in situ, or other post-war prefabricated or system housing. The most common form of solid wall housing is 9-inch thick brick construction. The EHCS estimates that 21% of English housing is of this type. The Domestic Energy Fact File¹² estimates the figures for non-cavity wall dwellings for England, Scotland and Wales approximately 20% lower than the figures shown above.

At present the technical solutions for all these types of housing are the same, namely internal or external wall cladding plus other efficiency measures appropriate in all houses such as loft insulation where there is a loft, draught-proofing, efficient central heating and effective double (or triple) glazing. Whether the technical solutions are applicable in any given situation is not addressed in this report, as issues such as planning permission in conservation areas come into play, and these are outside the scope of the report. Individual houses may be more suited to one type of treatment than others, and house condition e.g. wall condition, existence of damp,

⁸ op cit, note 3

⁹ Scottish Housing Green Paper 1999. <http://www.scotland.gov.uk/library/documents-w7/hgp-05.htm>

¹⁰ Wales in Figures 2000 Available at

www.wales.gov.uk/subihousing/content/framework/existingstock_e.htm#footnote2text

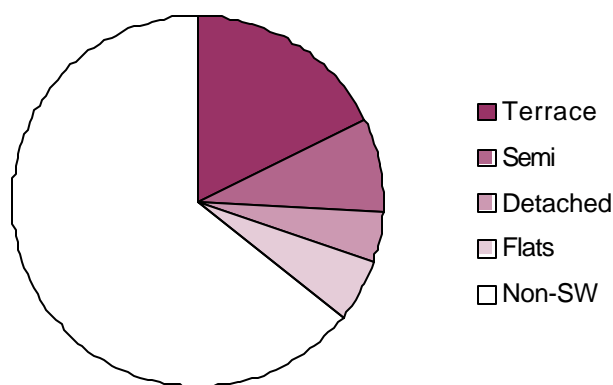
¹¹ Estimate from Noel Rice, NIHE, 23/11/01

¹² Domestic Energy Fact File, Building Research Establishment

ventilation, are also factors to be considered. As the treatment of all non-cavity wall homes under the hard to heat banner is similar, the term may be used interchangeably with the term “solid walls”.

Figure 1 shows the different types of solid wall dwellings compared with the total for England. This emphasises the predominance of terrace houses in the analysis, due partly to the massive increase in housing during the Industrial Revolutions of the 18th and 19th centuries. Analysis of housing tenure shows that, on average, over 30% of owner occupied, 25% of social rented and 50% of private rented housing could be solid wall dwellings. It also shows that around two thirds (66%) of solid wall dwellings are owner-occupied, with only 18% in the social rented sector, and 16% in the private rented sector. This has implications both for the way improvement of solid wall housing is marketed and for solving the problem of fuel poverty.

Figure 1: Solid wall dwellings within total for England



The distribution of dwelling type is different in each of the devolved nations. In Scotland, the predominant forms are tenements and terraces¹³, whereas in Wales, detached and semi-detached cottages are the predominant forms of hard to heat home.

The key problem is that solid wall homes are generally energy inefficient. Some very thick walls retain heat and protect from extremes of temperature, but the age of these homes means that there is often a problem with damp, either through floor construction or inability to provide an effective damp course.

Energy efficiency of a house is shown by its energy rating.

There two energy rating systems in common use:

- SAP (Standard Assessment Procedure) which nominally runs from 0 to 100, but because it is a calculated figure rather than a scale, highly energy efficient homes can achieve ratings of 105 or more
- NHER (National Home Energy Rating), which is a scale from 0 to 10.

Solid wall homes tend to have low SAP ratings. Table 2 shows how the SAP ratings for a typical end of terrace house vary depending on the walls, the insulation and type of heating system.

The cavity wall dwelling has a higher SAP rating for each specification, but just adding gas central heating without any further insulation brings it above the national average SAP rating.

¹³ op cit, note 6

For the solid wall building, adding gas central heating leaves it below the national average. As SAP is also an indicator of the amount of expenditure needed to keep the dwelling warm, it can be seen that introducing better insulation has a far greater effect in raising the SAP rating (and reducing the amount spent on fuel) than just switching fuels. However, when considering climate change and CO₂ emissions, whilst insulation reduces CO₂ emissions by over 40%, just switching fuels makes a difference of more than 50%. However doing both reduces emissions by over 70%. It is likely that a programme that concentrated on installing gas central heating in hard to heat homes would also be required to increase the loft insulation where possible, and fit other measures such as draught proofing. It would be useful to have some fuller modelling of these scenarios based on actual numbers of homes that could be addressed by different measures, such as that carried out for housing stock in Scotland¹⁴.

Table 2; Comparison of SAP & CO₂ ratings for solid wall & cavity wall end of terrace house¹⁵

Solid wall End of terrace	SAP rating	CO₂¹⁶ emissions	Cavity wall End of terrace	SAP rating	CO₂ emissions
No insulation; 25 mm loft insulation, double glazing; electric storage radiators & single point hot water	24	18.3	Same spec	30	15.4
Add external or internal cladding to external walls and increase loft insulation to 250 mm	49	10.2	Add cavity wall insulation and loft insulation to 250 mm	52	9.2
Original Specification but with gas central heating and hot water system	39	8.0	Same spec. (i.e. gas central heating & hot water)	44	7.2
Full insulation with gas heating & hot water	67	5.0	Full insulation; gas heating & hot water	73	4.6

To summarise, hard to heat homes are those with solid walls, of non-traditional construction types and/or are off the gas network. This totals at least 36% of UK housing. Most of these dwellings have SAP ratings below average. There are insulating and/or heating solutions that can improve the SAP ratings and reduce the amount of CO₂ emitted through inefficient use of fuel.

3.2 Fuel Poverty

Fuel poverty is generally defined by describing those who need to spend more than 10% of their household disposable income on maintaining an adequate temperature in the dwelling as “fuel poor”. An adequate temperature is taken to be the World Health Organisation standard of 21°C in the living rooms and 18°C in other rooms. The UK Fuel Poverty Strategy¹⁷ now has a number of definitions, depending on whether Housing Benefit or other benefit income and/or housing costs such as rent are excluded or included in the “disposable” income. In this analysis, the larger of the available figures is always taken in order to cover those who are within the widest definition and therefore at risk of becoming fuel poor if the price of fuel changes.

¹⁴ op cit, note 6

¹⁵ Figures derived using Surveyor 3 software.

¹⁶ CO₂ emissions in tonnes p.a.

¹⁷ op cit, note 4

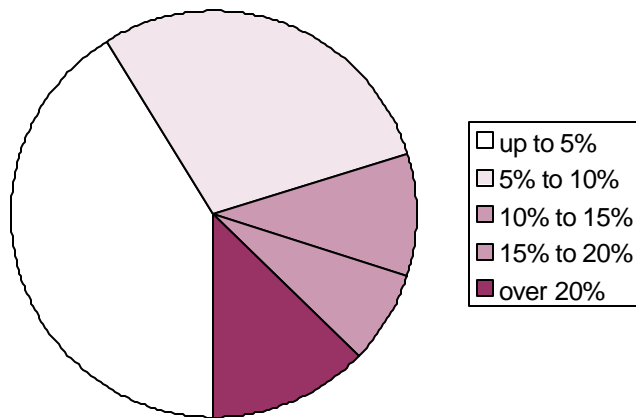
Current estimates of fuel poverty numbers show:

England	3.9m
Scotland	0.7m
Wales	0.2m
N. Ireland	0.2m

This totals around 5 million households in fuel poverty in the UK in 2000.

The number of people in fuel poverty living in solid wall homes can be interpolated from the analysis by the Building Research Establishment (BRE) on the 1998 figures¹⁸. In Figure 2, the deepest shades indicate the more extreme levels of fuel poverty. The diagram shows that 29.5% of fuel poor households (over 10% of income spent on fuel) live in pre-1919 homes. When comparing these numbers with the 1996 EHCS figures for dwelling age, it shows that 1.3 million people were fuel poor out of 4.8 million living in pre-1919 homes. Scaling this up to the estimated number of solid wall homes in the England, there are potentially 2 million households, or 44% of those categorised as fuel poor, living in solid wall homes.

Figure 2: Households in fuel poverty in pre-1919 dwellings, % of income spent on fuel



This is not surprising given the low energy ratings of solid wall homes. The BRE analysis also shows that while there is an underlying proportion of people that are fuel poor irrespective of the energy efficiency of the dwelling, overall there is an inverse relationship with SAP rating. 50% of those living in homes with SAP ratings below 20 are fuel poor, compared with only 14% of those whose SAP rating is above 50¹⁹.

It is not valid to scale up these figures to apply to the whole of the UK. There are differences in definition of “fuel poverty” for the home nations. The Scottish House Condition Survey (SHCS) has been analysed in respect of scenarios for addressing fuel poverty (which will be discussed in the next section), but there are no reliable indicators for the relationship with solid wall properties.

The current target of the UK Government is to eliminate fuel poverty amongst vulnerable groups by 2010. The definition of “vulnerable” is not entirely specific, but analysis of the EHCS figures in appropriate categories gives an indication of the scale of the problems in achieving this for solid wall dwellings.

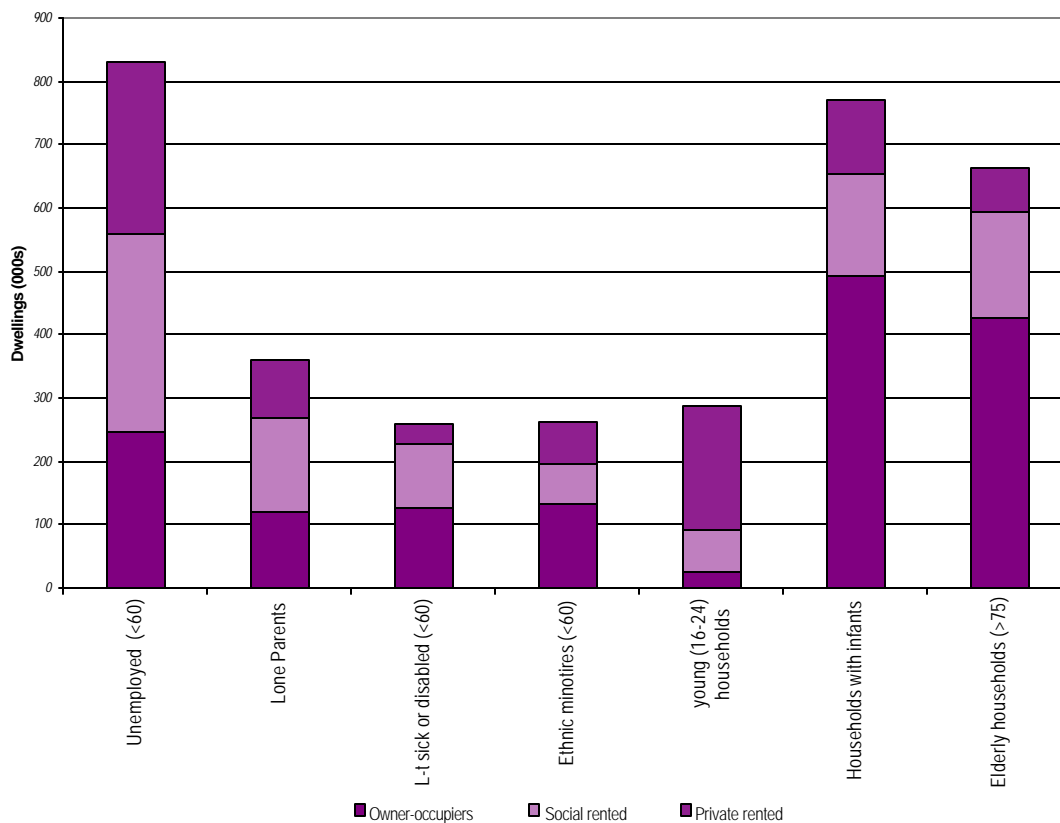
¹⁸ BRE “Fuel Poverty in England 1998”, DTI/DEFRA August 2001, Table 17

¹⁹ Ibid., Table 22

Figure 3 shows the numbers of households in different disadvantaged and vulnerable categories in solid wall homes, with their tenure, i.e. whether owner-occupier, renting from a private landlord, or renting from a social landlords such as a local authority or housing association²⁰.

This shows an estimated 259,000 long term sick or disabled, 664,000 elderly households, and 770,000 households with infants live in solid wall dwellings. There is the possibility of some overlap within these categories, as a household with a disabled parent, a grandmother living with them, and children under 5 in the same household would be counted in all three categories. It is not clear whether the other “disadvantaged” categories shown in this graph are included in the Government’s Fuel Poverty Strategy, or whether the age categories used here from the EHCS are the same as that in the Strategy.

Figure 3: Disadvantaged and vulnerable households in solid wall dwellings, England 1996



It is not possible to give any reliable estimate of how many of each category are fuel poor. Given the high level of fuel poor households in solid wall dwellings and the relationship between low SAP ratings, solid walls and fuel poverty, it is clear that solid wall dwellings have to be addressed in order for the Government to achieve its target. The greatest challenge will be to address the groups of households with infants and elderly households, where the owner-occupiers form around two-thirds of the total in each group.

What is clear is that hard to heat homes tend to have low SAP ratings, that 36% of UK housing stock is of hard to heat type, and that the risk of being or becoming fuel poor is greater for those in dwellings with low SAP ratings. Current figures suggest 44% of the fuel poor, or over 2 million households, live in hard to heat homes.

²⁰ DETR/DTLR “English House Condition Survey 1996” 2001; www.housing.dtlr.gov.uk/research/ehcs

3.3 Policy Issues

The scale of the problem indicated above clearly impacts on the Governments' policies for:

- fuel poverty and affordable warmth (UK Fuel Poverty Strategy 2001)
- climate change (UK Climate Change Programme 1999)
- energy efficiency and demand management (e.g. PIU report to the Government on security of energy supply, published February 2002)
- health (Health Act 1999)
- sustainability and quality of life (Quality of Life Counts; UK Sustainable Development Indicators 1999)

There is a growing realisation that these policies are not isolated from one another. The link between climate change and energy efficiency in policy terms is formally established. However measures currently in place for one programme, such as climate change, may be found useful to address another, such as fuel poverty, and changing priorities may mean that the original programme goals are obscured. These two policy issues are the main focus of this section. Health, energy efficiency and fuel poverty are being increasingly addressed through health programmes that recognise the cost of illness due to housing quality. These health policies are discussed only briefly. Quality of Life indicators measure improvement in a range of factors that are affected by these programmes, but improvement in one does not necessarily support improvement in another.

3.3.1 Warm Front and EEC

The main mechanisms currently in place for addressing energy efficiency in homes include Warm Front and the Energy Efficiency Commitment (EEC)²¹.

The Energy Efficiency Standards of Performance (SoP), the precursor of EEC, was introduced as a mechanism to assist in delivery of climate change policy, whereas Warm Front was initially more socially based to promote affordable warmth. Within EEC, energy suppliers are encouraged to build partnerships and address the majority (at least 50%) of their funding towards disadvantaged and vulnerable households in fuel poverty.

Whether these mechanisms can be applied to solid wall dwellings depends mainly on the definition of cost-effectiveness. Under SoP only "cost-effective" measures were approved (by EST) and the range of options for hard to heat homes was severely restricted to those with an "acceptable" financial cost-payback period. The decision on what measures are approved to count towards the suppliers' EEC target is made by the Regulator i.e. Ofgem. It is not clear whether it is up to the regulator to define what measures are cost-effective or for the energy supplier to determine what is cost effective for them to deliver under their commitment. In either case, there is an opportunity for external or internal cladding measures to be included in the mix of measures that can be funded, and if the social costs of fuel poverty can be included, then the argument for more expensive measures is strengthened. Once the cost of carbon is established through the emissions trading system, the arguments over cost-effectiveness will be even more interesting. The cost of measures is discussed further in section 3.4 below.

The current grant maximum for Warm Front work has been raised to £2000, which will bring the options of internal cladding and some external cladding work within scope for some properties, especially where work is already scheduled and therefore insulated cladding is a marginal additional cost. However as the Warm Front programme now excludes the social rented sector, the chances of the insulation being seen as an "extra" to scheduled work are small.

²¹ EEC – the Energy Efficiency Commitment for energy suppliers which replaces the Standards of Performance system from April 2002.

Other measures that can be applied to hard to heat homes other than those off the gas network are included under both mechanisms.

For off-gas network homes, effective insulation is a priority to ensure the best use of the heating that is available. Therefore the inclusion of cladding under Warm Front or EEC is important.

In the Fuel Poverty Strategy the Government has identified Warm Front and EEC as key mechanisms and included development of new and renewable technologies such as micro-CHP, specifically with off-gas network homes in mind. Micro-CHP units currently under development are designed for use with gas, but not necessarily mains gas; a project such as the Calor Gas supply to Deiniolen in Wales²² provides an “off-gas network” solution. The extension of the gas network as a solution to fuel poverty is also under examination; preliminary reports from the DTI’s Working Party appear to state that this will not solve fuel poverty on its own, but may have other social and environmental benefits²³. Other efficient heating measures are also being developed that may be allowable under Warm Front and EEC, such as oil fired condensing boilers with a SEDBUK rating²⁴ equivalent to or better than comparative gas condensing boilers. This emphasis on switching to gas is one that is presenting some concern over possible increases in carbon emissions. Where gas heating is replacing standard (fossil-fuel based) electricity or coal, emissions are likely to fall as demonstrated in Table 2, but some concerns have been raised over fuel switching without emphasis in heat loss reduction from the dwelling.

3.3.2 HECA

The Home Energy Conservation Act (HECA) requires Local Authorities to plan to improve the energy efficiency of housing in their area by 30% on a baseline of 1995 by 2010. A private members bill (The Home Energy Conservation Bill) is currently before Parliament with the object of giving authorities statutory powers to achieve this target. The HECA action programme, administered by EST, has given rise to 216 projects in the period 1996 - 2002. Local Authorities are carrying out their own programmes in some areas. These programmes have various strands including education, health partnerships, and many others.

3.3.3 Energy Policy

Energy efficiency measures also form part of energy security; the PIU report on energy policy²⁵ has now been published emphasising energy efficiency as a key strand of future energy policy. The report recommends an improvement target for home energy efficiency of 20% by 2010 and a further 20% by 2020. It analyses the likely effect of its proposals on fuel poverty, but highlights that fuel poverty is primarily a social challenge in which incomes, house size, energy efficiency levels and prices all contribute. It emphasises that the fundamental reason for fuel poverty in the UK, as opposed to Europe, is the quality of the housing stock.

3.3.4 Housing

The Government’s Decent Homes standard is a four-part definition. Social housing providers are required to identify all homes that do not meet these standards and propose a plan to bring them up to standard by 2005. Standards include basic requirements such as walls and roofs, internal standards such as bathrooms and kitchens, and thermal comfort requirements. There is some concern amongst Local Authority Housing departments that the number of houses requiring improvement and the financial budget required to achieve that improvement mean that the target is unachievable²⁶. However, this standard does support and, in effect, prioritise hard to heat homes.

²² Simpson, M, “Hearthwarming” Green Futures no. 32 January/February 2002 p 23

²³ William Gillis speaking at Energy Efficiency Partnership for Homes event 29/01/02

²⁴ Standards of Efficiency for Domestic Boilers in the UK

²⁵ PIU “The Energy Review” February 2002, Cabinet Office

²⁶ personal communication with HECA East Network members

3.3.5 Health

Links between cold homes and ill-health are well established²⁷. The Health Act addressed the organisation of health care in the UK such that the emphasis now falls on Primary Care Trusts (PCTs) to deliver local care working through the network of health professionals. Health Improvement Programmes (HimPs) have been established to set the strategic direction on reducing inequalities and deliver better-integrated, user-centred health and social care. They set the framework for Health Action Zones (HAZs) whose aims are to overcome barriers between health and local authorities and between professions, especially in areas of high deprivation²⁸. This is leading to joint projects between local authorities, often represented by HECA officers, and local health practitioners to set up networks identifying those who may be at risk from energy inefficient homes and referring them to programmes such as Warm Front. The value of such projects can be justified by a saving of as much as £450 per household per year on health care costs for those in improved housing compared with those in unimproved housing²⁹.

3.3.6 Sustainable Development

The UK Quality of Life headline indicators include poverty, health, housing and climate change, and give a snapshot of the state of the country as a result of measures and events. Affordable warmth in hard to heat homes relates to each of these indicators. The question for policy makers is that of priorities and value for money, i.e. what measures will have the greatest effect across a range of indicators. The PIU report has started to address such cross-cutting evaluations and more research is needed into the real costs and savings of different programmes and the effects they have, whether social, environmental or economic.

3.4 Costs

If determining the number of hard to heat homes and the numbers in fuel poverty is an inexact science, then estimating the costs of dealing with the problem is even more so. Costs vary from property to property to the extent that two adjacent properties could require different measures and different additional costs. The cost of preparation and finishing e.g. scaffolding and attention to details of pipes, windowsills etc., add substantially to the relatively low cost of insulation. Carrying out work to a number of properties at the same time, i.e. an estate or a group of houses that can be treated as an estate, provides economies of scale.

BRE estimate that external wall cladding comes within the narrow definition of “cost-effective” when it is done as part of a general refurbishment, i.e. insulation is additional to external cladding³⁰. Doubling the thickness of insulation quoted in their figures would still come within the acceptable marginal extra cost. This indicates that a case can be made for ensuring that energy efficiency money is applied to measures where walls are already being refurbished. An additional £1000 per dwelling would enable most end-of terrace and semi-detached houses to be addressed as part of a refurbishment programme.

An “average” cost of external cladding and render for a semi-detached or end of terrace house is difficult to assess. Whilst the cost of the insulated cladding is typically only £5000³¹, the experience of Penwith Housing Association³² shows that preparation, cable and pipework,

²⁷ for literature review see Henwood, M, 1997 “Fuel Poverty, Energy Efficiency and Health” EAGA Charitable Trust

²⁸ ACE and PIP “Health and Energy Efficiency; working in partnership for healthy homes” 1999

²⁹ Ambrose 1996 quoted in “Affordable Warmth and Health Action Zones – A Good Practice Guide” NEA August 2001

³⁰ op. cit, note 3

³¹ ibid.

³² Project analysis supplied after the Hard to Heat Homes workshop

plinths, beads, flashings, sills and joints and other labour can double that cost for a 3 bedroom end of terrace house.

The Insulated Render & Cladding Association (INCA) have calculated that approximately 5 million households in the UK would benefit from external insulated cladding. They point out that apart from thermal insulation, external render and cladding also provides long term weatherproofing, may add value to the house, improves sound insulation and may provide an improved appearance on an individual basis. However their estimated costs are lower, £3000 for terraced housing in quantity, £3,500 to £5000 for other types, in quantity, and £4000 to £6000 for individual housing in a scheme³³. In a submission to DEFRA on behalf of the Energy Efficiency Partnership for Homes (EEPH) Insulation Strategy Group³⁴ they estimated that by 2005 there would be 10.75 million dwellings of hard to heat types (including cavity wall unsuitable for filling). Of these 7.95 million would be “fuel rich”, i.e. three-quarters who might be persuaded to pay through taxes and incentives, and one-quarter either fuel poor or low income who would need assistance. The original assumption about the number of solid wall properties in their figures is somewhat higher than the high estimates from EHCS³⁵ but the ratio is probably realistic given that more low income families live in social housing. However, it should not be assumed that all the properties that could be addressed under a stock improvement programme are either low income or fuel poor households.

INCA and BRE agree that for internal wall lining an average cost of £1500 for a semi-detached house is a reasonable estimate. INCA suggest £900 to £1200 for the 75 mm material and £1500 to £2000 for the thinner thermal laminate, both costs including finishing but excluding wall furniture such as skirting boards.

Costs of gas central heating are well established under the Warm Front and EEC schemes, with gas condensing boilers costed in at a marginal £145 over the cost of standard central heating. For those off the gas network, there are oil condensing boilers now on the market. A comparison of the relative merits of gas and oil as a fuel, with both subject to variations in costs, and the cost of extending the gas network, are outside the scope of this project.

Among other non-insulation measures which could benefit hard to heat homes, domestic solar hot water schemes are currently working on a typical installation cost of £1500 for DIY schemes through a solar club, and £2500 for fully installed versions. Costs of renewable energy schemes including solar PV and micro CHP, as well as community energy schemes, are the subject of Government grant programmes, and are considered outside the scope of cost comparisons for this project.

In summary then, costs of measures for hard to heat homes are variable and need to be considered on a case by case basis. Insulation as part of a refurbishment programme is cost-effective at approximately £1000 marginal cost; internal wall lining costs on average £1500, external insulated cladding £5000 for the cladding but double for the whole work package. Other measures that are deemed cost effective include gas central heating with a condensing boiler; oil condensing boilers are a possible option. Domestic solar water heating is possibly a cost effective option for those off the gas network. Projects currently in progress under EEC and EST's Innovations programme (see below) will inform these costs; other related work will be addressed in the next section.

³³ INCA “Insulated Render & Cladding: Some Facts and Surmises” INCA, Haslemere, Surrey

³⁴ EEPH Proposal to DEFRA 14 November 2001

³⁵ op cit, note 3

4 RECENT AND CURRENT RELATED WORK

The Warm Front and EEC mechanisms described above form a basis for work improving the energy efficiency of the UK housing stock. Much work has been and is being done by various actors including local authorities, housing associations, energy advice providers, energy consultants, NGOs and programmes promoted by DEFRA (and formerly DETR) through the Energy Saving Trust and others. The problem facing these agencies is access to funding and conflicting priorities. Improving cavity wall homes is easier to do and requires less finance, but still faces resistance from home-owners and local priority setters. So far only approximately one third of cavity wall homes have been insulated³⁶. This section attempts to give a brief overview of work that relates to or informs affordable warmth in hard to heat homes, but does not generally address individual projects.

Accredited installers	To begin to overcome the perceived lack of quality workmanship and professional building standards, the EEAC network and some local authorities maintain lists of installers in their local area; EST are developing a formal accreditation system
Best Practice	<p>Information on best practice projects appears to be widely held, but there are opportunities for consolidation and dissemination. The Energy Efficiency Best Practice Programme, run by BRE for EST is the principal route for this, but CIBSE also have research projects of relevance.</p> <p>Best practice projects run under HECAction and other EST programmes are accessible on the Practical Help website³⁷.</p>
Education	<p>Educating installers, local authority officers, councillors, anyone who has links with energy efficiency through their jobs or professions, and the public is an area being addressed as part of many energy efficiency schemes.</p> <p>The Institute of Energy plans to map the types of employment which require basic levels of understanding of energy efficiency, through to those whose needs are far greater.</p> <p>Energy efficiency NVQs exist, but may require further development to meet changing needs.</p>
Energy labelling and incentives for home owners	<p>The EU Draft Buildings Directive will require energy certification of buildings in some form when contracts are renewed or on changes of ownership, as well as every ten years for commercial buildings above a certain size.</p> <p>It is understood that DTI's Construction Directorate is investigating a variety of tax instruments for promoting energy efficiency in buildings including homes. It is likely that this work will inform the proposed "Sellers Pack" which was dropped from legislation in May 2001.</p>
EST Innovations	The EST Innovation programme, currently in pilot phase, has a number of projects that may be relevant and informative. These will eventually be recorded as case studies on the Practical Help website.

³⁶ estimated from figures presented at Energy Efficiency Partnership for Homes event 29/01/02

³⁷ www.practicalhelp.org.uk

EST/SAVE	A European SAVE project researched the employment generated by energy efficiency programmes. EST also published the UK case studies ³⁸ .
Fuel Poverty modelling	BRE has the data from the English House Condition Survey and has worked on a number of models and scenarios for DTI and DEFRA in connection with the Fuel Poverty Strategy. These models are not yet in the public domain.
Health	A number of programmes are in place to combine energy efficiency and health issues. Health Action Zones (see 3.3.5) are one initiative, and a number of HECAction schemes have addressed health issues, usually through partnerships with local health professionals to set up referral schemes for those in need of energy efficiency measures.
Housing Corp IGP	Housing Corporation Innovation and Good Practice programme supports housing associations in projects that will develop best practice for wide dissemination. Housing Corporation grants and new build standards also mean that housing associations are more likely to utilise the option of demolishing dwellings that are beyond the point of repair and replace with ones built to “above Building Regulations” standards.
Local Authorities	Among the many projects and programmes being carried out by LAs, are local house condition surveys which will allow them to determine exactly how many solid wall properties they have, in what condition, and develop a strategy for tackling the problems of both low SAP and excess carbon emissions.
National Energy Action	NEA is carrying out a number of studies of effectiveness of schemes including Warm Front. They are also key players in disseminating information about fuel poverty initiatives and developments through their regional Fuel Poverty Fora, which meet on a regular basis.
Partnership	<p>The Energy Efficiency Partnership for Homes has a number of sub groups each with work plans.</p> <p>The Strategic Audit and Review of energy efficiency marketing carried out by Basten Greenhill Andrews identifies a number of ways in which energy efficiency marketing needs to be improved. Marketing plans need to work closely with the Industry Groups who are further developing training and certification schemes to develop career paths for skilled trades people, and to increase the number of qualified installers.</p> <p>The Energy Advice Providers Group has identified the need for good service levels and reliable advice, and is developing an accreditation scheme for Advice Providers.</p> <p>The Education and Community Group has developed a handbook to enable community and special interest groups (i.e. not necessarily geographic communities) to develop energy efficiency projects which reap local benefits.</p>

³⁸ Wade J, Wiltshire V, & Scrase I, “National and Local Employment Impacts of Energy Efficiency Investment Programmes” ACE 2000 and ACE “Energy efficiency and jobs: UK issues and case studies” EST 2000. Both available on the ACE website www.ukace.org

The Fuel Poverty Group work plan is informing the development of the work programme in this report. The group originated much of the work leading to the Warm Front programme. A Fuel Poverty Scheme Design Database has already been launched to help record and disseminate information about schemes. Following a conference in July 2001, the group has recommended five sets of activity in order to tackle fuel poverty in “Difficult Properties”. These can be summarised as:

- Redefine the measures available and grants available based on the social context and household type
- Energy efficiency to be incorporated into housing repairs (social and private sector)
- Re-assessment of use of “cost-effective” measures versus others with wider benefits
- Advice and information (including health impacts) especially to under-occupiers and elderly householders
- Identification of extent of fuel poverty in difficult properties

They have an action plan to tackle these issues.

PHA report

Penwith Housing Association has produced a report based on its experience of addressing solid wall housing³⁹

Relationship with climate change

The UK Climate Impacts Programme carried out a consultation on Climate Change & the Built Environment research priorities in autumn 2001. One of the suggestions was research on how to prepare common house types to withstand more severe climate events more effectively.

This research, if it goes ahead, will inform the argument for addressing hard to heat homes, as it is anticipated that some measures to insulate homes will have weather-protection effects and vice-versa.

Rural Fuel Poverty

The EAGA Charitable Trust report “Rural Fuel Poverty: defining the research agenda” is in publication⁴⁰. CSE have researched the issues distinguishing rural fuel poverty from urban fuel poverty, and identified those that are common. The three research themes are:

- research on the nature and extent of fuel poverty
- delivering energy programmes in rural communities
- developing innovative energy services in rural areas

The issues of hard to heat homes and how research should complement other Government initiatives are addressed under the second of these themes.

³⁹ Available in hard copy from Penwith Housing Association, 67 Morrab Road, Penzance TR18 2QT, or from the ACE website, www.ukace.org

⁴⁰ Baker, W “Rural Fuel Poverty: defining the research agenda” EAGA Charitable Trust Report No.7, forthcoming

Sustainable Homes	Sustainable Homes ⁴¹ is a major project promoting sustainable development and environmental awareness to housing associations in England.
Warm Zones	The Warm Zones Pilot is sponsored by DEFRA. 5 pilot areas (Stockton, Sandwell, Newham, Northumberland and Hull) are undergoing a systematic identification of fuel poor households with a target to eradicate fuel poverty in 3 years (to March 2004). The schemes are locally co-ordinated to put in whatever measures are necessary to address the problem. The initial evaluation will be completed in the summer of 2002; any expansion depending on the initial evaluation will not be until at least winter 2002.

It appears that the people and organisations working to eliminate fuel poverty are aware of the difficulties of addressing hard to heat homes. They also appear to be well networked, although information overload may be a problem. There is no indication whether the well-publicised projects are better, or just better publicised than those that have not been lauded.

However the housing officers, environmental, health and HECA officers who are tasked with making programmes work on the ground suffer from shifting priorities and perverse legislation and/or incentives. These can include issues such as the Data Protection Act inhibiting exchange of data about those who qualify for benefits, and therefore grants, between two departments of the same LA. The Decent Homes standards require that the new priority is those in worst need, which are also solid wall homes where fewest solutions are available. Whilst this assists the focus on hard to heat homes, it does not help to utilise the available money on the “easy to do” properties whilst plans and funding are found to tackle the more difficult ones. Local authority work also depends on the commitment of funds from tight budgets, which in turn depends on the understanding and commitment of elected representatives to energy efficiency and related policies.

This report does not attempt to identify work that needs to be done to enable the local democratic system to prioritise energy efficiency or fuel poverty measures, or to overcome problems of internal mechanisms. That work may form part of the education needed, but it has not been separately identified. However the next two sections discuss the further work that has been identified, and thought necessary, and then proposes a programme by which it might be achieved.

⁴¹ Jenny Wain, Project Co-ordinator - Sustainable Homes, Hastoe Housing Association, Harlequin House, Teddington, Middlesex, TW11 8EE. 020 8973 0429 jwain@hastoe.com

5 AREAS FOR FURTHER WORK

The work has been categorised under nine headings through analysis of the workshop sessions.

- Work needed for different audiences:
 - Owner Occupiers
 - Social Landlords
 - Private Landlords
- Benefits
- Grants & Incentives
- Fuel Rich & Fuel Poor
- Building, Energy Supply & Insulation Industries
- Skills & Standards
- Advice
- Attitudes & Education
- Policy & other issues

This section examines each topic in turn and identifies those proposals which form activities and tasks to be taken forward. The activities are then placed into a prioritised work programme that is described in the following section. The numbers are prefixed R (recommended work) to distinguish them from earlier section numbers.

Another audience was identified during the workshop – planners. Research carried out in January 2002 by ACE, Impetus Consulting and CSE to assist the EST's Innovation Programme⁴² identifies the specific problems working within the planning system that was proposed in the December 2001 workshop. This can be summarised:

- the planning system does not affect existing housing developments unless proposals are above the roof line, lead to change of use, are for dwellings in conservation areas or affect listed buildings.
- issues for hard to heat homes that might fall within scope are external works in conservation areas, renewable energy projects involving new structures (primarily wind projects) and any work on listed buildings. In these cases planning permission will probably be required.
- Planning Officers work to a range of Guidance of what is or is not permitted, and there are few examples of “permitted” as each case is treated on its own merits. Key documents include the Local Development Plan and any Supplementary Guidance that may be applicable.
- Work on hard to heat homes and fuel poverty may fall within the local or strategic plans, in which case addressing the problems may be taken into account as a “material consideration”. However this does not guarantee that any improvement scheme requiring planning permission would be successful.
- Planning officials need to be involved at an early stage if permission is required, to gain their advice and expertise. However, many Planning Officers are not aware of the importance of energy and energy efficiency in the local environment as a part of the national picture, and they, and the elected members on planning committees, are an audience which needs to be addressed under any education programme.

The work activities that remain to be undertaken are as follows:

R.1. Work for different audiences

⁴² Barton D, Pett J & Michael J “Planning for Sustainable Energy Projects” EST, unpublished

R.1.1. Owner Occupiers

R.1.1.1. The main issue is how to get owner occupiers to buy energy efficiency measures. This fits closely with the marketing assessment from the EEPH, but this did not consider the question “why do people buy?” Most further work is dependent on outputs from work suggested on Benefits and Grants & Incentives, but identifying one or more compelling messages for home owners and getting away from the “energy saving saves you money” is essential in the current low-cost energy climate.

R.1.1.2. The implication is that a full marketing analysis of energy efficiency as a product for home owners needs to be undertaken. This will also address issues of delivery, including access to trusted sources of information; access to trusted companies to install the measures, and sales and after-service issues.

R.1.1.3. Education and legislation are also part of the package. If Sellers Packs are to be introduced, the benefits of Sellers Packs and the value of high energy rated properties will take time to be proven. Lobbying and PR work may be needed for acceptability of Sellers Packs, and the role of NGOs in this should not be underestimated.

R.1.1.4. In conjunction with this, the enthusiasm of the British public for DIY solutions needs to be accepted, and a project will be needed, working with DIY retailer(s) and with manufacturers, to make DIY installation a safe and reliable option.

R.1.2. Social Landlords

R.1.2.1. A best practice manual for social landlords of how to address common house types needs to be prepared from a technical standpoint, and is probably best tackled by an architectural practice or by the RIBA. This also has potential for use by owner occupiers, although it is thought that owner occupiers would be better served by being brought into schemes operated in their area by social landlords, perhaps through an Energy Club approach.

R.1.2.2. This leads into the second area of work, which is to identify ways to get all HAs & LAs to bring stock up to standard with long-term planned support for refurbishment programmes to allow for realistic budgeting. As a policy mechanism this would have to be ring-fenced from political change to ensure the budget was committed over a long enough period. The alternative would be in the realms of legislation beyond the HEC Bill 2001, and hence probably outside the scope of this project.

R.1.3. Private Landlords

Whilst private landlords were recognised as being a separate audience, not enough was known about the specific nature of their problems. A full marketing analysis and assessment of opportunities to engage them was required, including identification of the appropriate benefits and incentives to them of carrying out energy efficiency work on their properties, or indeed, of enabling the work to be carried out for their tenants on their behalf.

R.2. Benefits

R.2.1. Although eliminating fuel poverty and reducing our impact on climate change are Government commitments, more needs to be done to persuade them of the need to address, and provide the funding for, hard to heat homes. A credible, well researched report is required, supported by trusted advisers to Government, analysing the short and long term benefits (economic, social and environmental, taking a lifecycle approach) of addressing affordable warmth in hard to heat homes. This should take a multi-disciplinary approach so that the report would be accepted equally in DTI,

DEFRA, DTLR and DoH. It would not be complete without addressing the costs, both in pounds to the Treasury, and other economic, environmental and social costs. The result would be a definitive text covering multiple policy issues.

R.2.2. If this report included regional approaches, it could also be addressed to the Government Offices for the Regions and to the Scottish Parliament and to National Assemblies. For clarity, it might be preferable to complete regional supplements.

R.2.3. As described in R.1.1 and R.1.3, a full marketing analysis is required to determine effective, appropriate benefits messages to different audiences. The issue of the cost of energy and “save energy save money” is not sufficiently strong in the current energy market. A message is required that people will act on to improve their homes by insulating them (or fitting efficient heating systems). The EEPH marketing group has identified this as an issue, but only in part. Underlying motivational and behavioural theory need to be tapped in order to think “outside the box” of conventional energy saving messages. The marketing analysis should then lead to a revised marketing strategy taking into account medium-term domestic energy efficiency goals.

R.3. Grants & Incentives

R.3.1. Although there are evaluations of individual schemes, an analysis of past and current grants and incentives schemes is required. This should cover the social, environmental and economic effects of the schemes, but also identify the message that was given with the grant or incentive and what trends can be identified. This will inform the cost benefit analysis and the marketing strategy suggested in R.2.

R.3.2. This analysis should lead to a project that would inform the cost benefit analysis, namely modelling the effects of grants and incentives on market development and transformation. This project may require academic input, and links with potential work of the Carbon Trust in market transformation.

R.3.3. The scenarios that were developed for the different types of measures for Scottish Housing should be undertaken using EHCS data, to give an indication of the effect of take up of measures. This should be followed by a similar exercise for Wales and Northern Ireland. The identification of the effects of these measures on fuel poverty would inform the direction of the grant or incentive scheme design.

R.3.4. Develop a database for grants and incentives that can be searched inputting key variables. This is for use both by those seeking to establish what they are eligible for and those needing to identify what is and is not covered under grant funding. The EST has a database covering grants for individuals; this would extend the facility to cover grants to organisations. There is also a Briefing Note on finance for local authorities on the Practical Help website⁴³. However there is a view that collating information should be replaced by work aiming to streamline the grants system and to make funding less complex. This may also link with the proposed EEPH Fuel Poverty group work to assess a “grid” of grants and measures appropriate to different types of property and household.

R.4. Fuel Rich & Fuel Poor

The full marketing analysis in R.1.1.2 should investigate differences in marketing approaches to the two groups. Some work needs to be done to assess these different markets and develop proper strategies for each, including work on tax incentives and discriminatory pricing.

⁴³http://www.practicalhelp.org.uk/casestudies/finance/bn_fin.doc

R.5. Building, Energy Supply and Insulation Industries

R.5.1. The EEPH energy supplier, building, insulating, glazing and heating groups have their own work plans on how to improve their contribution to energy efficiency in the home. This report suggests that the insulation industry needs to undertake a SWOT analysis (strengths, weaknesses, opportunities and threats) of its industry as a whole to cover structure, capacity, economics, competition, safety, deliverability and marketing, and identifying interaction with other industries to achieve energy efficiency in the home. This would not only lead it to identify the best strategy for the industry to tackle the issue of hard to heat homes, but also inform the marketing strategy identified in R.2.3. It may also assist the Carbon Trust to identify key issues for the introduction of technologies in the future through its Low Carbon Impacts Programme.

R.5.2. Research or scenario modelling is needed for a mix of renewables, CHP, insulation and other options for communities in “difficult” areas. This may need to be done on a regional basis, and may be different in city centre, urban and rural areas, due to the differences in underlying costs and access to services.

R.5.3. A feasibility study is needed for a programme (including regulation and incentives) to translate case studies and pilot projects into general practice. The plethora of case studies and best practice projects rarely needs another case study to be developed except where a new invention or application is involved; the problem is getting such case studies into general practice. Innovation includes getting best practice adopted, not just identifying best practice.

R.5.4. The DTI Working Party on extending the gas network has reported, but there is some concern that it has not addressed the economic, social and environmental cost benefit analysis over an intermediate period (such as 20 years) of extending the gas network versus installing community energy solutions. Equally, the standards being set now for hard to heat homes are those expected now. A medium view of what is required by 2020 in a low carbon future, and whether measures installed now will help or hinder progress, would be useful.

R.6. Skills & Standards

R.6.1. This report recognises that it is essential to address the issue of skilled workmanship delivered with good customer service to people in their own homes by reliable and trustworthy companies. To this end, those few companies with household names in the insulation business, together with builders, installers, installer networks, central heating and gas engineers, need to work together to market the benefits of warm homes to the consumer and not the technical specifications of their products to each other. Marketing the benefits calls for a more professional approach, underpinned by professional qualifications and standards, recognised by the public, and policed or otherwise maintained by the industry itself.

R.6.2. As part of progress towards this goal, work is needed to identify skills gaps and the extent of the shortfall of trained workers in measures required to deal with hard to heat homes. It would be preferable if workers were multi skilled in this respect, rather than bring in different people to deal with insulation, pipework, gas safety, etc. There are already NVQs and other awards but development of a complete standard for a “master craftsman” in energy efficiency is required.

R.6.3. EST is already developing an approval system and registration network for consumers to find quality companies. The profile of this system needs to be raised and the network given “teeth” to ensure high standards are maintained and improved. It was suggested that Building Control were one of the few bodies able to inspect work to ensure that quality is maintained. Building Control and others should be consulted to

identify strategy for improving quality and standards, including award of Quality Marks etc.

R.6.4. In UK society, many people enjoy improving their own homes. Guidance needs to be developed for those measures which can be DIY installed, with proper inspection, certification and or an energy efficiency award given where appropriate. Such an award needs to be considered under the marketing strategy in R.2.3

R.7. Advice

R.7.1. Capacity building and development of common standards for the EEAC network was work suggested from the workshop. This is being addressed by the EEPH Advice Providers Group, who are tendering for a programme to develop advice standards and training for all energy advice providers, including in energy suppliers and consumer bureaux, as well as EEACs. The programme develops minimum standards and a code of practice, which is due to be implemented fully by July 2003.

R.7.2. Following development of guidelines for common types of dwellings recommended in R.1.2, develop a national initiative encouraging all Local Authorities to put together local guidelines/packages on dealing with hard to heat homes. This may need to be in conjunction with the DIY work suggested in R.6.4

R.8. Attitudes & Education

R.8.1. Develop an understanding of the extent to which energy education is required within the full range of employment types (an energy “map”). This is understood to be included in a project proposed by the Institute of Energy, who is the appropriate body for this work.

R.8.2. Develop a seminar programme for key professions including GPs, PR people, ministers, council officials, estate agents, mortgage lenders, surveyors etc. This might usefully be developed by the Institute of Energy following or as part of the “mapping” exercise, so that it can be linked with other professional qualifications, both at pre-qualification level and as recognised continuous professional development (CPD). Some programmes under HECAction in Scotland and HAZs may inform this work.

R.8.3. Develop an education package within the ‘sustainable development’ part of National Curriculum to ensure buildings and their thermal performance are understood better by everyone.

R.9. Policy & other issues

R.9.1. The proposal from the workshop to “Research whether there is a base SAP rating below which measures must be installed or a demolition policy applied” gained several responses in the consultation phase of this project. These included “this would take 30 seconds”, “this would demolish every historic house in the country” and “each property is so different, it depends on the underlying fabric condition”. The concept behind the suggestion is that there should be consideration of whether demolition should be more widely used if we really intend to tackle fuel poverty and hard to heat homes. Social housing providers need to ensure that their homes meet standards of decency and fitness through the Decent Homes standard and the Home Health & Safety Rating system. These now include considerations of thermal condition. On that basis, the research already exists for social housing providers, if they have completed their stock condition survey. The question is whether further research is needed to gain attention to owner occupied and private rented sector dwellings and to suggest suitable strategies, including grants and incentives or legislation where appropriate.

R.9.2. Map existing demonstration projects and develop further so that there is one in every ‘town’ (‘town’ being an indication of proximity or ease of access for interested parties). One of the issues mentioned in R.5.3 is that demonstration projects are not

being taken up as standard practice. This idea allows people to experience warm energy efficient homes in their own neighbourhood. Most people do not buy a car without a test drive, homes are even more expensive and more opportunities to experience the benefits of energy efficiency are desirable.

R.9.3. Evaluate the carbon impacts of the Fuel Poverty Strategy 2001. There is some doubt whether the measures and strategy detailed in this document will achieve its aims and whether, if it does, it conflicts with the Climate Change Strategy. The Government will be consulting on an amendment to paragraph 2.1 of the Strategy⁴⁴ indicating clarification of the dates of eliminating fuel poverty as far as reasonably practicable. This also indicates that new measures will be needed. An analysis of the Fuel Poverty Strategy as it currently stands, given the estimated number people living in fuel poverty in hard to heat homes and those not being addressed by current measures, would inform the research described in R.2.1.

R.9.4. Finally, a number of comments received after the workshop draw attention to the need to continue to develop innovative ways of addressing hard to heat homes. The measures announced by the Government to trial renewables and technologies such as micro CHP form part of this, but other ways may be better. Proper R&D of new ideas and methods, challenge to designers, and setting a goal of existing homes refurbished to a SAP of 100 and more, are all part of the mix of solutions. These R&D approaches fall within the scope of sustainable development, and need to be addressed as priorities by the relevant grant funding bodies.

⁴⁴ The Rt. Hon. Michael Meacher MP in a letter to Friends of the Earth 30/01/02

6 RECOMMENDED WORK PROGRAMME

This work programme is developed from the priorities suggested in the Initial Report amended by consultation. It identifies work projects or activities according to the paragraph numbering in the previous section.

The first two priorities, which were generally agreed, reflect the growing understanding of the need to act and that some action can be taken, especially with the new approach to expenditure by the energy suppliers on energy efficiency measures through EEC. These priorities are:

1. Act now where solutions are known. Use existing information.
2. Enable EEC money to be applied to the marginal cost of insulating solid wall properties where refurbishment is already planned. This addresses the immediate problem of those LAs and HAs who have planned refurbishments but not the additional funds for external insulation.

The other 'most agreed with' suggestions from the consultation were

3. Develop 'our own' skills in presenting a compelling argument to Government.
4. Address the issues of training and quality assurance of building work with a view to developing the market so that there is indeed a long term career for people with these skills.
5. Develop a strategy for working with key players: planners, developers, health workers and elected representatives.

These are reflected in the work programme laid out diagrammatically in Figure 4. Reading this diagram from left to right indicates priorities and timescale, but there is no indication of elapsed time. This means that boxes on the right hand side of the diagram bear no relation in time to the boxes above or below them. The lines between the boxes are significant. Lines going into or out of the vertical sides of boxes (in at the left and out at the right) indicates precedence. This means that the project on the left needs to precede the one on the right; the work must be done in order for the following project to be carried out properly. Where lines join boxes at the top or the bottom, it means the projects have a loose relationship or inform each other.

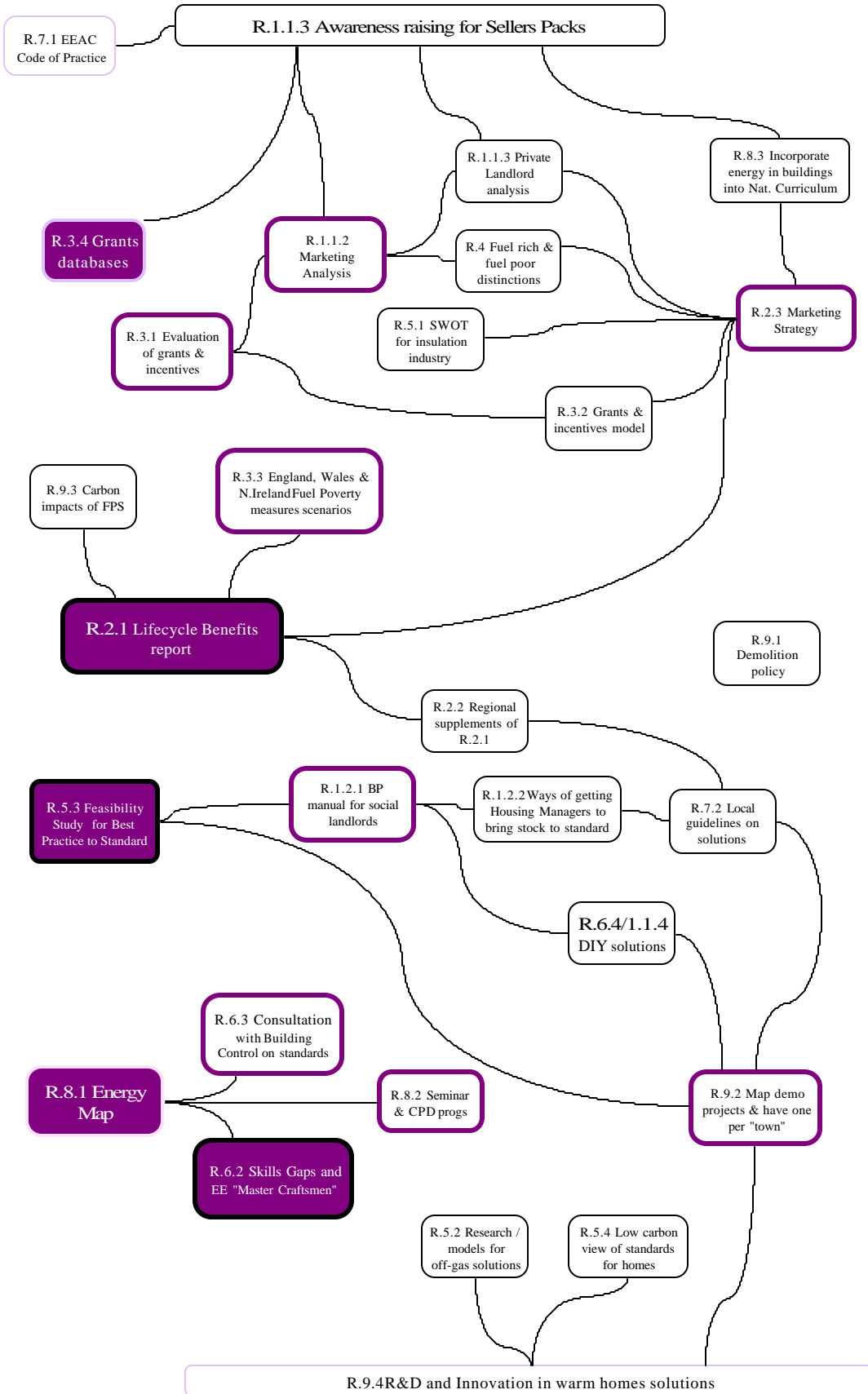
The boxes with light outlines are thought to be projects under consideration, wholly owned or being pursued by other bodies. Dark boxes are priority projects; heavy borders are second level priorities.

Two boxes have been elongated: "Awareness raising for Sellers Packs", and "R&D and Innovation in warm homes solutions". These are long term background activities. The R&D work may belong in both academic and practical innovation; it is important that innovations here are evaluated and brought through the best practice route where appropriate.

There are broadly four strands of programme work:

- Marketing, starting with "Grants databases" (EST project) and "Evaluation of Grants and Incentives to date". Because of the need to make progress on the Marketing Analysis, the Evaluation project needs to be instigated urgently.
- Lifecycle Benefits (cost benefit analysis). This forms the crucial part of the raising of our own skills to present the argument to Government better. This lifecycle benefits research report is a major study, and will require funding. Possible sources include a partnership between EAGA Charitable Trust, EEPH and the Government's Fuel Poverty Advisory Group. Two other pieces of work would usefully be undertaken to inform this study, the Carbon impacts of the Fuel Poverty Strategy and the Scenarios on Fuel Poverty for England Wales and N Ireland. The England figures for the latter may be already within the scope of BRE's work for DEFRA/DTI, and the work should be commissioned by the Fuel Poverty Team. The assessment of the Fuel Poverty Strategy is not necessarily important, but it is urgent, and it supports the case to Government, so should be carried out promptly.

Figure 4: Proposed Work Programme



- **Best Practice Dissemination.** It is clearly difficult to turn best practice into standard practice, judging by the results of the Housing Energy Efficiency Best Practice programme to date. A feasibility study to develop a robust strategy is required, one which will analyse the work to date from an independent viewpoint and identify effective routes for market transformation. To some extent, the work that is indicated to follow this is assumed to be relevant to such a strategy. It is suggested that an independent Feasibility Study and Draft strategy is commissioned by DTLR/DEFRA, with input from the Housing Corporation (who may see the Best Practice manual for Social Landlords as part of their objectives for affordable warmth strategies in Housing Associations) and BRE.
- **Skills & Standards.** All of this work is priority. It informs all the other work if recommendations or output from the other work is to succeed. It commences with the Energy Map of employment. *This work is therefore top priority and should be undertaken and disseminated immediately.* Work related to this includes priority work on identifying skills gaps in installers and raising the profile of quality standards in installation to improve the product and service offered to the consumer. It also relates to other work; enforcing standards with Building Control and a longer term process of integrating understanding of energy efficiency into professional qualifications and continuous development (CPD) for a wide range of practitioners. The Institute of Energy and others such as EEPH are best placed to lead this latter work. This forms the backbone of developing better relationships with planners, developers, health workers and elected representatives. In order to address them successfully, the cross-sectoral costs and benefits case needs to have been developed through the Lifecycle Benefits report, and energy practitioners must understand the need to 'talk their language' to raise the profile of energy efficiency in hard to heat homes.

Precisely who will take this work forward is unclear. Some strands have recognisable lead bodies, such as EEACs through the Partnership for Homes, or by the Institute of Energy. Given the role and scope of the Partnership, that forms a likely lead body for wider issues, but the Government's Fuel Poverty Advisory Group is also a candidate for leading on certain aspects of the work. The key driver is to tackle the issue of the 44% of fuel poor who live in hard to heat homes, amounting to some 2 million households. There is a short breathing space before measures already in place to tackle the "easy" properties have been exhausted, at which time leadership and guidance resulting from this work needs to be in place to enable the next phase, tackling the hard to heat homes.

7 SUMMARY AND CONCLUSIONS

There are many problems in addressing affordable warmth in hard to heat homes but many solutions are known. There are barriers which need to be addressed through perseverance, and others through sharing of knowledge, easier access to funding, change in attitudes, a more planned or strategic approach, support from legislation, market development and other methods. It is important that action is taken now where it can be, as the long term goals are straightforward.

Some research is still needed, but there is a danger of continuing to research in too great depth. Should we spend money addressing both fuel poverty and the carbon emissions problem with a broad-brush approach? Or, should we spend more on research to refine the instrument, so that only fuel poverty is addressed through finely targeted measures? While the fuel poor could be better targeted, and more included in current or revised measures, the reduction of carbon emissions through the existing measures is worthwhile in itself. However more work is needed to access fuel poor who are excluded from society, particularly for rural areas.

We need to improve the case to Government. We need to underpin much of this work with robust, evidence-based argument of the costs and benefits covering diverse policy issues and professions. We need to get the right messages for key players, and get a consistent but effective message to the public that leads to them taking appropriate action. Research is required leading to a coherent marketing strategy and also to disseminate best practice so that it is adopted as standard. Research is also needed to move beyond current best practice, considering near zero- emissions solutions and lower cost applications of current technologies.

There is doubt whether the Government's Fuel Poverty Strategy target to eliminate fuel poverty in vulnerable households by 2010 is going to be met and whether the carbon cost will be excessive through the measures suggested. Addressing this issue was not seen as a priority, yet it is both urgent and relevant to developing the case to Government for addressing hard to heat homes, so the work must be undertaken promptly.

Top priority is developing the understanding of those whose work relates to energy efficiency and fuel poverty of their role in the issue. This covers both the skills and standards of those who will implement solutions, and those whose work impacts on the fuel poor or on policy decisions affecting hard to heat homes.

Two key strands of the workshop were finance and technical issues. These are not overtly addressed in the work programme, except through an overall evaluation of the grants and incentives leading to a modelling approach for the future. The underlying work required is to determine what works to motivate people to address hard to heat homes, and proposing how this can be applied in future in such a way that does not exacerbate problems of supply and demand in terms of installation capacity. Associated with this is a desire for the insulation industry to identify its own strengths, weaknesses, opportunities and threats, in order to feed into this programme and provide, at least in part, a market driven solution. The alternative is for R&D to come up with a solution for hard to heat homes that is low carbon and works in a free market. This is not to ignore the contribution of gas and renewables in affordable warmth in hard to heat homes, but the barriers to their success are being addressed openly. Other technical issues are largely addressed through the work programme suggested on best practice combined with further R&D.

The initial premise of this project was that once housing managers and others had addressed the "easy" to heat homes (where cavity wall insulation was appropriate) they would need to address the hard to heat homes in order to achieve their objectives. Those might be Decent Homes standards, Fuel Poverty, HECA or other considerations. For those housing managers where hard to heat homes must be addressed now, the solutions are there, but the infrastructure and understanding are not. This project presents a series of work strands needed

to address the infrastructure and set the conditions for solving the problem. This will be through application of technical solutions that have been subsidised either through well-founded research and policy measures or through improvement in market conditions such that a sustainable industry develops. The wider problem is addressing individual householders, an issue which will require a step change in achieving market take up, and where regulation may be essential. The proposed “Sellers Pack” or published energy rating for homes, supported by the draft Buildings Directive, provides the regulatory incentive for home owners, but the solutions need to be developed to be easily adopted for installation through retail-type channels. The figures estimated through this project show that the market is there, but it does not understand the need. The work programme suggested in this project would begin to address that understanding.

Addressing the issue of affordable warmth in hard to heat homes is a long term project. The more we delay, the longer it will take to reach a solution, unless conditions become so bad that the quickest and cheapest solution is to demolish all houses below the acceptable standard. The threefold drivers of fuel poverty, climate change and health will surely prevent such a long delay.