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Fuel Poverty

Perspectives from the front line

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THE BIG ENERGY UPGRADE

EPSRC Pioneering research and skills

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The BIG Energy Upgrade

The BIG Energy Upgrade is a regional flagship £14.9 million project, part financed by the European Union Regional Development Fund, addressing the priority needs of both reduction in carbon emissions and the creation of jobs. To address the issues in an integrated approach the University of Sheffield has brought together a multidisciplinary team of academics working alongside Local Authorities, ALMOs, social housing providers and an energy services company. The BIG Energy Upgrade, is delivered by a consortium of local authorities and social housing providers, led by Kirklees Council. It is a very ambitious project as, for the first time in the UK, the Partners will work together in adopting a fully integrated, whole-house approach while installing energy efficiency measures and micro generation technologies in households. Through individual household assessments the project will identify a highly individual package of measures for each of the households which will provide optimal insulation and energy control to the house.

The University plays a key role in the project by providing a multi-disciplinary approach to understanding and optimising the interrelated technological, behavioural and economic factors. A team of academics is monitoring the performance of the installed energy efficiency measures, studying the material's lifecycle, looking at behaviour of those living in the newly insulated houses as well as at the communities affected by the intervention, monitoring energy consumption in selected households and supporting the supply chain associated with the energy efficiency measures particularly the one associated with the external solid wall insulation.

The project addresses key national priorities of:

- reducing CO2 emissions from the installed base of residential dwellings, required to meet national CO2 reduction
- alleviating fuel-poverty
- driving regional economic growth in this expanding field

The results of the project have particular relevance for the forthcoming Green Deal, a government initiative which is launched in March 2012. The project, to retrofit energy-efficiency and renewable-energy measures to residential dwellings is the largest such venture in the UK.

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Executive Summary

Fuel poverty, namely the ability for a household to afford to heat its home to an adequate standard, is a fairly recent concept. Despite recognition of the problem in the early 20th century, it wasn't until the late 1970's that Fuel Poverty was recognised as a problem and not until 1997 that government officially adopted the term. With the introduction of the Warm Homes and Energy Conservation Act (WHECA) in 2000 (Great Britain, 2000) fuel poverty was formally defined within UK government legislation.

The prevalence of fuel poverty within the United kingdom has been exacerbated by a number a number of climatic and historical factors including the mild, temperate climate, domestic building heritage, preference for open fires and 'fresh air' and evolving thermal expectations. This, combined with a low turnover of buildings has resulted in over 50% of the English population living in housing built to a poor standard, with a focus on air circulation constructed prior to the introduction of thermal regulations in 1965.

A fuel poor household is currently defined as

> "...one which needs to spend more than 10% of its income on all fuel use and to heat its home to an adequate standard of warmth."
>
> (DEFRA and DTI, 2001, p.6)

Whilst the above definition benefits from measuring modelled energy requirements, it is overly sensitive to price changes and suffers from a number of other issues and technical complications. The Townsend Centre for International Poverty research took a census-based approach to measuring fuel poverty. The report highlighted the lack of overlap between households identified as fuel poor through objective measures compared to those reported as fuel poor by subjective measurement. It also demonstrated the impact of income consideration in measuring fuel poverty, criticising the current measures approach (Fahmy et al., 2011). The Hills review also criticised this aspect of the current measure and offered a new conception of fuel poverty measuring both the extent and depth of the problem (Hills, 2011, 2012).

Fuel poverty impacts upon multiple areas of policy and is not just the concern of the Department for Energy and Climate Change. Perhaps the most significant impact is on health, with a close correlation between excess winter deaths, cardio-vascular disease, respiratory problems and mental health. As well as physical health, social health is also affected as fuel poverty alleviation reduces anti-social behaviour and other associated social ills. It also impacts on housing policy through consideration of development, housing legislation and retrofit issues. Accurate measurement of fuel poverty is vital for measurement of the success or otherwise of the Green Deal and Energy Company Obligation.

Many policy documents and other fuel poverty literature refer to the concept of stakeholders, but with no definition of what they mean by this or who they are. Through the inclusion of stakeholder perspectives via their first hand experience of living or dealing with fuel poverty at both a practical and a strategic level a more detailed measure of fuel poverty can be developed that will not only allow future policy and interventions to be more accurately targeted towards the most needy households but also capture more precisely the impact of policies such as the Green Deal and ECO in the reduction of fuel poverty.

Introduction

The recent publishing of the final report of the Hills review into fuel poverty (Hills, 2012) marked the first large scale investigation into the suitability of the UK fuel poverty measure since its inception into government policy over a decade ago (DEFRA & DTI, 2001).

The current measure, building on the definition of fuel poverty provided in Brenda Boardman's seminal book, (Boardman, 1991) has many benefits. It is based on modelled energy needs rather than actual energy consumption, is utilised in an increasing range of countries, is relatively straightforward and is an official National statistic.

However it also suffers from a number of weaknesses including an over sensitivity to price, the out-dated basis of the 10% threshold for spending on energy, the potential for inclusion of high-income households in the measure and technical issues surrounding its treatment of income, as highlighted in the final findings of the Hills Review (Hills, 2012).

Against a background of a global financial slowdown and significant cuts in government expenditure, the Hills Review sought to investigate the suitability of the current measure of fuel poverty and if necessary, suggest an alternative. In a time of austerity the targeted utilisation of limited resources is vital for realising the elimination of fuel poverty by 2016. The Hills Review maintained a technical and economic measure similar to the original approach to capturing fuel poverty yet introducing two separate measures, one of the depth and one of the extent of fuel poverty. In doing so it refocused fuel poverty measurement towards Low Income, High (fuel) Cost households as was the intention of the Warm Homes and Energy Conservation Act (WHECA) (Great Britain, 2000).

The Hills measure of fuel poverty and subsequent modelled projections of its impact upon fuel poverty figures suggest that the number of households affected will actually have increased by 2016, rather than have been eliminated as was legislated in Warm Homes and Energy Conservation Act (WHECA) (Great Britain, 2000). It can be seen that policy founded upon an inaccurate measure of fuel policy has done little to reduce this social ill over the past decade and immediate action is required if there is to be any hope of reducing fuel poverty significantly by the end of the decade.

An accurate measure of fuel poverty will be central to realising this aim. Whilst the Hills measure is certainly an improvement upon the current measure, the lack of inclusion of subjective stakeholder experiences of fuel poverty threatens to continue an inaccurate capturing of the extent and depth of the problem across the UK. A simple measure of fuel poverty may provide many methodological benefits but will fail to capture the impacts of schemes such as the Green Deal and Environmental Company Obligation. Research has shown that there is little overlap between households deemed to be in fuel poverty by objective measures and those reporting to live in fuel poverty through subjective measures of fuel poverty. Therefore the concept of fuel poverty must be revisited once more and an accurate new measure of fuel poverty created that accounts for and reflects the views and needs of fuel poverty stakeholders whilst maintaining the benefits of objective fuel poverty measurement contained within the current and Hills measures of fuel poverty.

This report continues by first exploring what fuel poverty is, the history of the term, how it is measured and its implications for policy. We then set out why we believe for fuel poverty to be successfully understood, an inclusive, stakeholder approach is required and how the current approach to fuel poverty fails to achieve this; before finally explaining the future research directions that will be explored as a result of this review.

What is Fuel Poverty?

The History of Fuel Poverty

The problem of fuel poverty, namely the ability for a household to afford to heat its home to an adequate standard is arguably as old as the human race itself. Neolithic man needed to gather fuel to heat his home and undoubtedly some families had greater access to sources of fuel than others.

Fuel poverty as a concept is a much more recent development. Despite reports to government, including from Simon (1946) and Parker Morris (1961) highlighting concerns over heating standards in the home (focussing in particular on social housing) (Boardman, 1991), it wasn't until the late 1970's (Owen, 2010), following the oil crisis of 1973-1974 and the UK government's decision to phase out subsidies to the electricity and gas industries (Johnson & Rowland, 1976) that Fuel Poverty was first recognised as a problem (Owen, 2010). Even at this point, the phrase was the preserve of campaign and pressure groups and was not used by government.

The concept of fuel poverty was developed through the late 1970's and 1980's, from one of the first definitions by Isherwood and Hancock (1979), with further development from Richardson (1981) (both reported in Osbaldeston (1984)), Lewis (1982) and culminating in the completion of Brenda Boardman's thesis in 1988 (Boardman, 1988), see figure 1.

In 1991 Brenda Boardman published her now seminal work, which made the first quantifiable definition of fuel poverty (Boardman, 1991). Boardman states that fuel poverty can be defined as:

> "the inability to afford adequate warmth because of the inefficiency of the home"
>
> (Boardman, 1991, p.219)

The threshold for affordability was set at 10% of household income being spent on energy, which was twice the median household spend on fuel at the time. Whilst Boardman's work is now considered a key text in the fuel poverty debate, it was not until the Labour party came to power in 1997 that the UK government officially adopted the term fuel poverty. The previous Conservative administrations failed to recognise the problem as anything different to general poverty.

In November 2000 the Warm Homes and Energy Conservation Act 2000 became law, requiring the Secretary of state for England and the National Assembly of Wales "to publish and implement a strategy for reducing fuel poverty and set targets for its implementation". The publication of the UK Fuel Poverty Strategy in November 2001 allowed the UK government to meet this requirement and for the first time Fuel Poverty was recognised in legislation and government strategy .

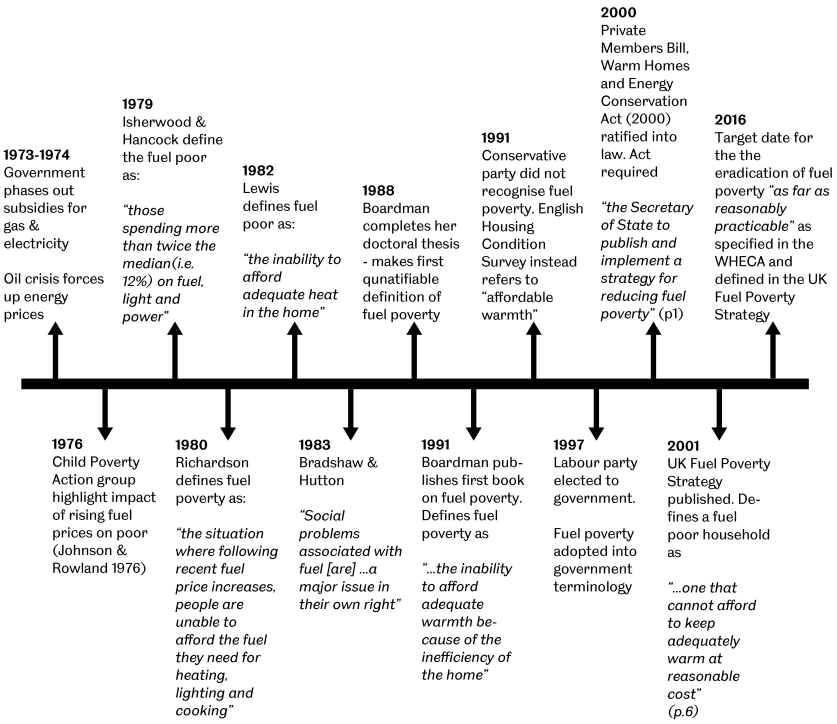

Figure 1. Historical progression of the fuel poverty definition

Historical housing legacy and fuel poverty

Rudge (2011) highlights a number of historical factors that have influenced the existence of fuel poverty within the United Kingdom, such as the mild climate, domestic building heritage, preference for open fires and 'fresh air' and evolving expectations.

Attitudes to acceptable household temperatures have changed dramatically over the last 130 years. In 1880, 12 - 20°C was advised for living space and an a minimum of 4°C in the bedrooms; compared to the current WHO guidelines of 21°C in living areas and 18°C in bedrooms (World Health Organisation, 1987).

Even though attitudes to acceptable temperatures have changed, a major underlying factor in the prevalence of fuel poverty within the UK is the age and quality of the housing stock. The structural flaws of a typical UK house that made it hard for them to maintain warmth were documented by German architect Hermann Musthesius in 1904 (translated in 1979).

> "...the insubstantial structure of the English house, especially the meagre thickness of the walls, the absence of cellars, of double glazed windows"
>
> (Muthesius, 1979, p.67)

It is only in the latter half of the twentieth century that legislation shifted away from fresh air, lighting and space to consideration of insulation and warmth. Thermal regulations were only introduced in the UK in 1965, and were only really effective from 1974. According to the English Housing Survey Headline report (2010 – 2011), 58.1% of English homes were built prior to the introduction of the first thermal regulations in 1965, with just over a fifth of the total English housing stock having been built before 1915 (see figure 2.)

	Private Sector				Social Sector			
	Owner Occupied	Private Rented	all private		local authority	housing association	all social sector	all dwellings
Dwelling Age								*percentages*
pre 1919	**21.0**	**40.0**	**24.8**		**3.8**	**9.4**	**6.7**	**21.7**
1919-44	**19.0**	**12.3**	**17.6**		**16.1**	**9.3**	**12.5**	**16.8**
1945-64	**18.9**	**10.7**	**17.3**		**38.0**	**24.7**	**31.0**	**19.6**
1965-80	**20.0**	**13. 6**	**18.8**		**34.8**	**24.4**	**29.3**	**20.6**
1981-90	**8.4**	**7.4**	**8.2**		**6.1**	**12.5**	**9.5**	**8.4**
post 1990	**12.6**	**15.9**	**13.3**		**1.3**	**19.8**	**11.1**	**12.9**

Figure 2. English Housing Stock Profile, 2010 (DCLG, 2012, p.53)

A significant contributor to the late consideration of thermal standards and a traditional focus on fresh air and space rather than air-tightness is the British climate. Continental Europe is characterised by much larger temperature variation than Britain, with colder winters and warmer summers. In order to accommodate such extremes, consideration of construction materials and air-tightness has been seen as a much greater priority for a longer period in Europe than Britain.

Whilst Britain is not exposed to extremes of temperature as regularly as Europe, the day to day fluctuation and geographical variation in temperature in the UK is much more significant. With regular variation in temperature, British housing materials are subject to harsh freeze/thaw conditions that damage and challenge the integrity of our buildings. Similarly, due to the reduced difference between winter and summer temperatures, research has characterised the British heating period as lasting from September until May. With such a prolonged heating period and associated carbon output it is right that current building regulations are focussing on thermal qualities for the benefit of both the occupant and the environment.

It is apparent then that an ageing housing stock, predominantly built prior to the development

of thermal standards, to a quality considered to be unacceptable in comparison with continental Europe has left England and the UK with a significant legacy of sub-standard housing which only serves to exacerbate the current issue of fuel poverty.

Measuring Fuel Poverty

Accurate measurement of fuel poverty is necessary on a number of fronts. It enables policy makers, support groups and the population at large to understand how many people are living in fuel poverty whilst also developing a picture of how it is evolving over time. An accurate measurement also facilitates meaningful evaluation of initiatives to eradicate fuel poverty and helps target resources where they are needed the most.

The Current Fuel Poverty Measure

Whilst the concept of Fuel Poverty is receiving increasing attention across many countries (particularly New Zealand and to some extent central Europe), its measurement and definition still predominantly focuses on that offered by Boardman and utilised by the United Kingdom government. The UK Fuel Poverty Strategy (2001) states that,

> "...a fuel poor household is one which needs to spend more than 10% of its income on all fuel use and to heat its home to an adequate standard of warmth."
>
> (DEFRA and DTI, 2001, p.6)

The greatest strength of this measure is its focus on modelled energy needs rather than actual energy consumption, meaning it is not influenced by households that choose to keep their homes at a cooler or significantly higher temperature.

Although this definition has been used for the calculation of official Fuel Poverty figures in the UK for over a decade, has the status of an Official National Statistic and forms a baseline for fuel poverty policy in the UK and abroad this measure is not without its weaknesses.

The primary criticism concerns its sensitivity to price fluctuation in the energy market (see figure 3.)

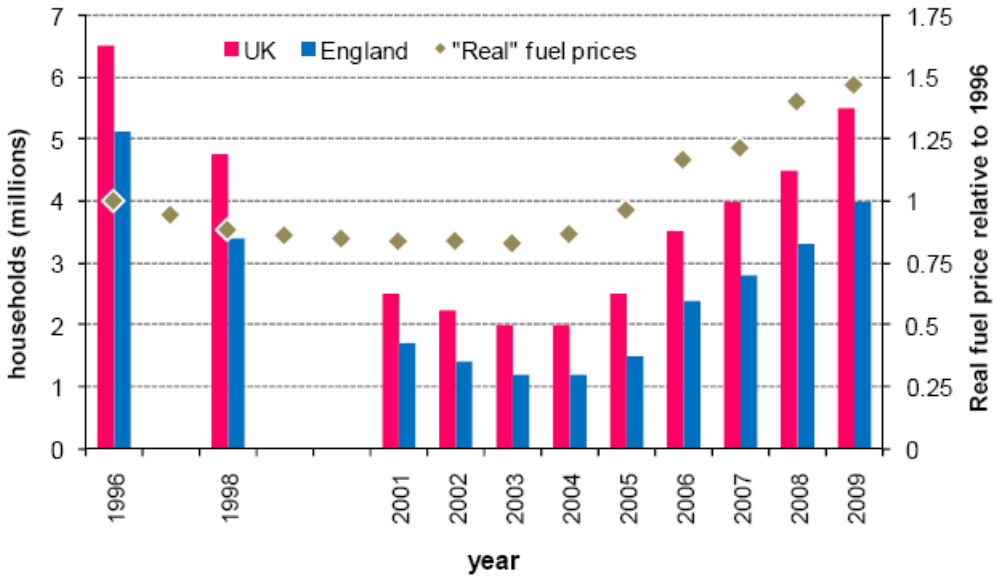

Figure 3. Fuel Poverty and Real Fuel Prices 1996 – 2009 (DECC, 2011a)

As can be seen in figure 3 there is a strong correlation between fuel price and the level of fuel poverty as captured by the current fuel poverty measure. Fuel Poverty rose from 5.9% of households in 2003 to 18.4% of households in 2009, more than tripling than number of households in fuel poverty (DECC, 2011b). Over the same period domestic gas prices rose 105% and domestic electricity prices rose 60% (DECC, 2012). Responsiveness to fuel prices unduly dominates the current fuel poverty measure when compared to changes in household income and energy efficiency levels, the two other main drivers of fuel poverty.

Other criticisms levied at the measure include the apparently arbitrary decision to fix the income threshold at 10% (Hills, 2012). This appears to have come from double the 5% median spend on energy in 1988, though justification of choosing to set the threshold at 10% seems to be on a subjective decision that this level of spending is unacceptable. Altering the threshold will have significant impact on the figures in fuel poverty and median spend on energy has fluctuated since the introduction of the UK Fuel Poverty Strategy in 2001, though the threshold has stayed fixed throughout this period. Similarly the current measure fails to capture the extent of fuel poverty being experienced, with households close to the 10% threshold being grouped with households spending a far greater proportion of their income.

Another focus of concern, particularly for the formulation of policy is the ability for the current measure to capture high income households and identify them as fuel poor. A recent article by the Financial Times announced "Soaring prices push Queen close to 'fuel poverty'". Whilst an extreme example it demonstrates how a decision to inhabit a large home will under the current definition, result in a very wealthy household being identified as fuel poor.

One area of contention is the current indicators methodology for dealing with income. Unlike many other UK government surveys, household income is not equivalised to account for different household size and composition and it is assumed that all household income below the income support threshold is mis-reported and is thus adjusted to bring the income in line or above the income support threshold. Commentators suggest that this is a highly questionable practice, out of line with not only other government surveys but also internationally accepted standards (Fahmy et al., 2011).

The Fuel Poverty Indicator

The Townsend centre for International Poverty Research launched its updated Fuel Poverty Indicator in 2007. This indicator took a Census-based approach to the creation of a new Fuel Poverty Indicator, therefore measuring fuel poverty proxies rather than directly measuring fuel poverty itself. A full discussion of this approach can be found in Fahmy et al., (2011).

This report focuses on predicting fuel poverty at the Lower Super Output Area level and demonstrates how sensitive fuel poverty geography and composition is to the ways in which fuel poverty is defined and measured, emphasising a particular disparity between households that would need to spend 10% of their income on heating their homes and households that subjectively report problems with heating their homes. The authors note that caution should be taken when considering 'objective' measures of fuel poverty in the absence of dwelling temperature measurements and fuel tariff data.

As with the criticisms of the current measure the report also notes the sensitivity of objective measures to the treatment of income in their measurement. This is most effectively demonstrated by their models of fuel poverty considering the Building Research Establishment income modelling techniques used by the current measure as opposed to the Houses Below Average Income (HBAI) technique used in other government surveys (see figure 4).

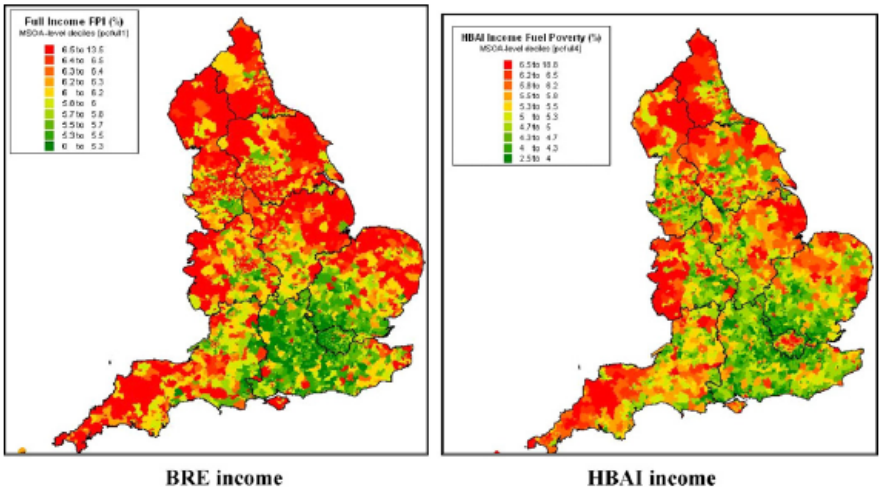

Figure 3. Full income Fuel Poverty Indicator, BRE vs. HBAI Income (Fahmy et al., 2011)

Whilst the two models are broadly similar, the HBAI income consideration results in a significantly higher incidence of fuel poverty in London and other metropolitan areas, highlighting the differences in household composition and the effects of equivalisation.

The Hills Review

The UK government recognised the limitations of the current measure of fuel poverty in 2010 and in 2011 appointed Professor John Hills to conduct an independent review of Fuel Poverty. The terms of reference for the review were to identify whether fuel poverty is a distinct problem from general poverty, how it should be measured if it is a distinct problem, whether the current approach is appropriate and what the implications for policy in tackling this problem would be.

Drawing on an initial call for evidence in summer 2011 and an interim report published in October 2011, the final report took the opportunity to capture evidence on measurement of fuel poverty from a broad range of interested parties including campaign groups, energy suppliers, local government and academics.

The review captured most if not all of the criticisms of the current measure as identified above, though shied away from Fahmy et al's (2011) stance on subjective versus objective measurement of fuel poverty, stating that:

> "While useful in complementing other more objective measures, we found this approach would not provide a solid enough guide for policy-making."
>
> (Hills, 2012, p.32)

In total the report made 7 main recommendations as well as 5 technical recommendations. The most significant of these recommendations was a re-definition of when a household should be considered fuel poor.

> "Households are considered fuel poor if:
>
> • They have required fuel costs that are above the median level; and
>
> • Were they to spend that amount they would be left with a residual income below the official poverty line"
>
> (Hills, 2012, p.9)

Hills also recommended that the government should adopt a new indicator of the depth of fuel poverty, known as the fuel poverty gap (see figure 5). This would be defined as "the amounts by which the assessed energy needs of fuel poor households exceed the threshold for reasonable costs" (Hills, 2012, p.9)

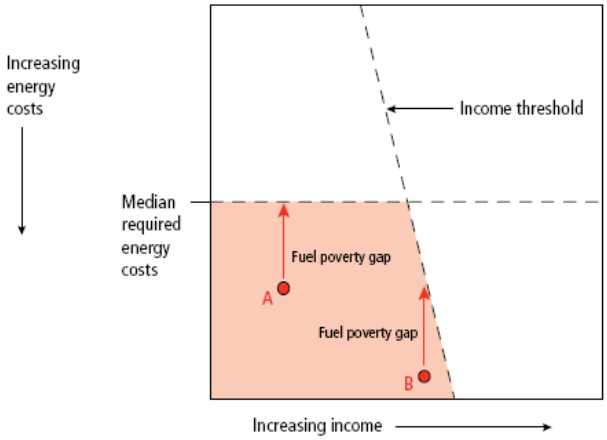

Figure 5. Fuel poverty extent and depth (Hills, 2012, p.9)

The adoption of this definition, brings the focus of the measure of fuel poverty back to those households with a low income and high energy costs, as was the original focus of the Warm Homes and Energy Conservation Act 2000 (Great Britain, 2000). Hills argues that the measurement

framework offers a better understanding of the different policy options open to tackling the problem in different households and the subsequent impact on other households, enabling more effective and accurate policy implementation than at present.

The report demonstrates that fuel poverty will actually rise by 2016 rather than be eradicated as was the original intention in 2000 and suggests that current policy will make only a small impact on fuel poverty figures under the new measure. Hills finally calls for a concerted cross-governmental approach to tackling fuel poverty if effective policy is to be introduced that can lead to significant reduction in fuel poverty.

Fuel Poverty – policy considerations

As identified by the Hills review and within the academic literature, fuel poverty carries a broad range of social implications which need to be addressed by governmental policy if eradication of fuel poverty is to be realised. Whilst the three main drivers of fuel poverty are considered to be low income, high fuel costs and poor energy efficiency of homes, the policy effects can be most readily seen in the fields of health, the built environment and social policy.

Health

Fuel poverty has a large number of implications for the health of the households and communities it affects. Each winter, mortality rates increase by 19% in England (Department of Health, 2011), and whilst not all of this can be attributable to fuel poverty, it is important to note that,

> "Countries which have more energy efficient housing have lower excess winter deaths"
>
> (Marmot Review Team, 2011, p.9)

The impact of temperature and damp upon the body is significant. As noted in by National Energy Action in their report for the Culture and Environment Regional Advisory Group of Public Health North East the key affects are:

- Above 18°C (64°F): No adverse health effects
- Below 16°C (61°F): Risk of respiratory infections
- Below 12°C (54°F): Increased blood pressure
- Below 9°C (48°F): Deep body temperature falls

(Sumby, Ford, & Rodger, 2009, p.9)

As well as an association with excess winter deaths, fuel poverty also has a strong relationship with cardio-vascular disease and respiratory problems. Furthermore, significant impacts on mental health in both adult and adolescent populations have been noted, with 25% of adolescents in fuel poor households suffering from mental health issues compared to 5% in non fuel poor homes.

Recent studies have considered cumulative health effects as a result of living in cold homes, which have shown to be increased risk of accidents in the home, arthritis, asthma, influenza and pneumonia (Liddell & Morris, 2010). A thorough consideration of the health impacts of cold homes is presented by the Marmot Review Team (2011), reviewing the key literature to date.

Social health impacts have also been observed in a number of studies and retrofit projects throughout the United Kingdom. Preliminary results from the BIG Energy Upgrade have shown that one of the most immediate effects of housing retrofit has been a noticeable increase in civic pride. Communities have become proud of where they live. Similar studies have shown that the improved visual appearance of the area has been combined with increases in school attendance and achievement, reductions in anti-social behaviour, dysfunctional families (Liddell & Morris, 2010) and teenage pregnancy.

The significant health impacts of fuel poverty are the major driver for the current focus on the

reduction of fuel poverty. In 2003, a consortium of experts estimated that for every 1°C drop in temperature below the average winter temperature there were 8000 extra winter deaths in the United Kingdom (National Heart Forum et al., 2003) and Age UK estimate that for every additional winter death there are around 8 admissions to hospital, 32 visits to outpatient care and 30 social services calls (Age UK, 2012). The cost of fuel poverty to society is significant and the potential savings from alleviating fuel poverty are notable.

Housing and Development

Whilst the strongest motivator for the reduction of fuel poverty is the health implications and associated cost to society, another key area for policy consideration is housing and development. At the current rate of housing demolition it will take around 2,000 years for a complete turnover of the UK housing stock, so unless a significant increase in redevelopment of housing is realised in the very near future, it is retrofit rather than development that is the only realistic policy option for UK government.

Retrofitting has received significant attention in the academic and practitioner community with studies in a wide range of countries including the United Kingdom, New Zealand, Canada and China amongst others. Studies have considered health benefits, green house gas reduction, architects challenges, occupant behaviour, fuel consumption and specific aspects of retrofit such as lighting or insulation.

Despite such wide spread consideration of retrofit, studies to date have been focussed on one or sometimes two of the areas identified above. The BIG Energy Upgrade is unique in this respect, in that it is the first study to consider all of the above retrofit impacts as well as their fuel poverty reduction effects.

In doing so, the data and outputs created by the BIG Energy Upgrade are of particular importance to the UK government when calculating and modelling the impact of the Green Deal upon society and the EU 2020 targets.

The Green Deal

The Energy Act 2011 (Great Britain, 2011) made provisions for the government's "Green Deal" proposal. The Green Deal was developed in response to the legally binding carbon reduction targets set out in the Climate Change Act 2008 (Great Britain, 2008).

The scheme is designed to enable and incentivise households to improve the energy efficiency of their homes at zero upfront cost. As long as proposed improvements meet the 'Golden Rule', (i.e. the expected financial savings must be equal to or greater than the costs attached to the energy bill), then the household will be able to install the intervention at no upfront cost to themselves, instead paying back the loan to the Green Deal supplier through an additional payment added on to the house's electricity bill.

Whilst the focus of the policy is on carbon reduction, the Green Deal also offers an opportunity to tackle fuel poverty. The new Energy Company Obligation (ECO, which replaces the previous Community Energy Saving Programme, CESP, and Carbon Emissions Reduction Targets, CERT) will integrate with the Green Deal to enable low income households (often most at risk of fuel poverty) to access supported funding reducing the projected financial addition to the household energy bill. This will enable more expensive interventions, such as solid wall insulation to be undertaken on needy households where the Golden Rule would have otherwise not have been met.

As a pay as you save scheme, the Green Deal is envisaged to be affordable to all. However with an estimated 2.5 million homes in arrears with their energy bills and an upward trend predicted in this figure it is questionable whether the Green Deal and ECO will be considered by the most vulnerable households, already behind in their payments.

In order to tackle fuel poverty, Green Deal and ECO provision will need to be focussed on the most vulnerable and hardest to treat homes. These homes are often characterised by under-heating and associated health problems. The installation of an energy efficiency intervention may not result

in a reduction in energy consumption in the household, but instead an increase in the thermal temperature of the house which will not be captured in reductions in UK fuel poverty statistics.

For fuel poverty to be reduced the current and proposed methods of measuring fuel poverty for the targeting of policy must be revisited. The current measure is based upon a highly economic and technological indicator and current Green Deal and ECO interventions will have only limited impact predominantly on marginal fuel poor households. Hills' proposed measure of extent and depth will enable more accurate targeting of policy, focussing on low income, high cost households. In this case it is likely that a reduction in the depth of fuel poverty will be realised (i.e. there will be a reduction in the fuel poverty gap), however given that previously the house was under-heated, the opportunity to remove the house from fuel poverty remains remote. The additional charge associated with the Green Deal element of the intervention is likely to push the most vulnerable households beyond the median required energy costs mark, so whilst thermal comfort will be improved they will still be suffering from fuel poverty under the Hills measure.

In order to tackle fuel poverty it therefore seems vital (as noted by Fahmy et al,(2011).) that a more accurate picture of internal household temperatures is captured, along with a combination of other objective and subjective measures for the creation of a more complex measure of fuel poverty. Whilst Hills rejects the use of subjective measures of fuel poverty Fahmy et al. (2011), note the lack of overlap between those objectively defined as fuel poor and those who subjectively report as experiencing fuel poverty. This suggests that, in order to target Green Deal and ECO measures precisely and ultimately improve cold home related health and reduce the numbers in fuel poverty a more complex and accurate measure of fuel poverty, combining both objective measures and subjective reporting of fuel poverty experiences is required.

Perspectives from the front line

Perspectives from the front line

In developing an approach to tackling fuel poverty it is apparent that the challenge of fuel poverty eradication affects far more groups than simply those living in fuel poverty. As a complex problem with multiple interacting factors, there are a broad range of actors that could be deemed to have a stake in the UK governments approach to tackling this problem.

With such a wide sphere of influence it is therefore important that measurement, policy and subsequent action considers the impact it has upon these actors. Stakeholder theory, as attributed to Edward Freeman (1984) and widely developed over the past quarter of a century offers a suitable lens for these actors and the government in particular to identify the variety of claims on the fuel poverty concept and prioritise them when developing policy, legislation and interventions.

By consideration of the opinions and views of those at the front line of fuel poverty from the outset of intervention development, it will be possible for the UK government to develop more appropriate policy that will tackle the root causes and problems of fuel poverty as identified by those experiencing it on a daily basis, delivering interventions and responding to the health and social impacts it is associated with.

Who are fuel poverty stakeholders?

Stakeholder theory has traditionally been focussed on the organisation and utilised as a strategic tool for the firm to understand how differing groups can impact upon and are impacted by the actions and decisions of the firm. Identification of stakeholders has received much attention in the academic literature with notable stakeholder models developed by Freeman, (1984) and Mitchell, Agle, & Wood, (1997).

Stakeholder theory has been receiving increasing attention as a tool for raising representation and participation in government (Lee & Chen, 2011). Despite this increasing adoption of stakeholder theory, debate over what constitutes a stakeholder and whose opinion counts remains.

Perhaps the most commonly cited framework for identification of stakeholders is Mitchell, Agle and Wood's (1997) identification typology of 'Power', 'Legitimacy' and 'Urgency', though multiple other approaches have been suggested including intuitive identification, theoretical identification, focus groups and snowball sampling.

Lee and Chen (2011) noted that purely qualitative approaches to identifying stakeholders can be associated with 5 main risks, exclusion of high-stakes stakeholders, failure to identify multiple stakeholders, misplacing stakes and jeopardising legitimacy of the stake leading to incorrect consideration of their stake, inaccurate homogenisation of stakeholders and undermining social equity through underestimation of the importance of stakes.

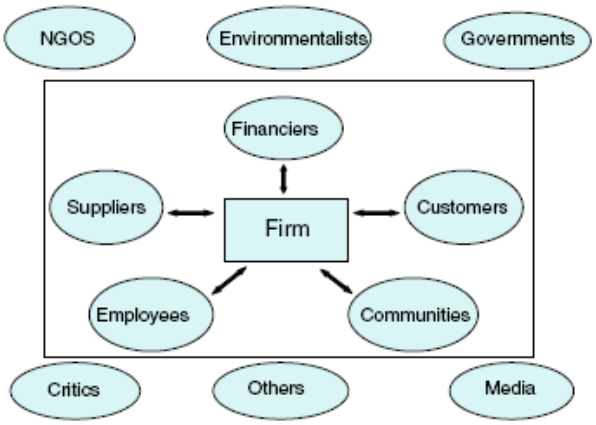

Figure 6. Freeman's adapted stakeholder model in Fassin, (2009)

Whilst this study is yet to undertake exhaustive research into fuel poverty stakeholders and their stakes, utilising Freeman's adapted version of the stakeholder model (see figure 6.) provides a strong framework for the intuitive initial identification of fuel poverty stakeholders, noting the limitations of this and other qualitative approaches as suggested by Lee and Chen (2011).

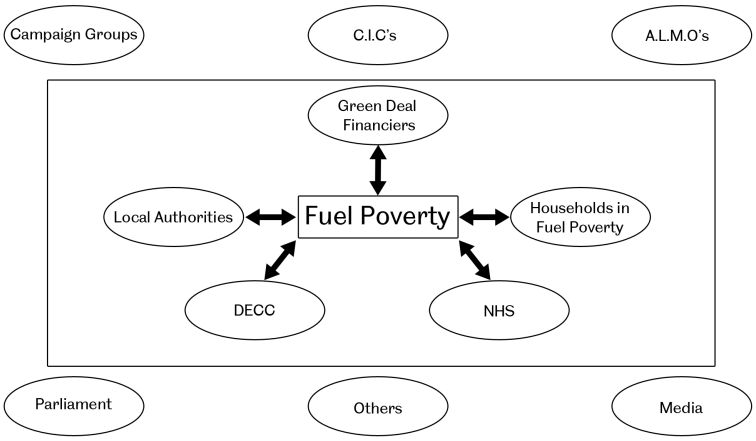

Figure 7. Preliminary identification of Fuel Poverty Stakeholders

The most widely accepted definition of a stakeholder is Freeman's (1984) suggestion that a stakeholder is any group or individual that "can affect or is affected by the achievement of an organisation's objectives" (p.46). If we refocus this definition by replacing 'the achievement of an organisation's objectives with a 'reclassification of fuel poverty', figure 6 goes some way to identifying potential stakeholders in fuel poverty classification that meet the definition of stakeholder as suggested by Freeman (1984).

To some extent the identification of stakeholders using intuitive identification is dependent upon the perception and beliefs of the individual. Figure 6 attempts to identify fuel poverty stakeholders from the position of central government for the benefit of accurate policy creation. This is only an initial, intuitive identification of fuel poverty stakeholders and is likely to change with future refinement and in depth research.

Consideration and identification of fuel poverty stakeholders is an area that has been given little or no attention in academic or practitioner literature, which is surprising given the challenge of fuel poverty eradication. This is perhaps a result of the need for swift action in order to meet legal requirements for the eradication of fuel poverty. It is however apparent from the recent Hills review that initial actions on the basis of an ill-defined measure of fuel poverty have had little positive impact on the underlying causes of fuel poverty. In order to ensure the effectiveness of future fuel poverty policy and the success of the Green Deal and ECO it is vital that future research identifies accurately the stakeholders in fuel poverty, prioritises them appropriately for policy response and ensures that their voice is brought to the forefront in the formulation and dissemination of policy and practical intervention.

What's wrong with the current approach?

Both the UK Fuel Poverty Strategy (DEFRA & DTI, 2001) and the most recent Fuel Poverty Strategy Progress report (DECC, 2009) make reference to action in relation to stakeholders. However formal identification of fuel poverty stakeholders has not been undertaken or explicitly referenced in any of these or other related documents. Instead, current policy, reports and guidance fall foul of the warnings highlighted by Lee & Chen, (2011), in that they apparently homogenise and simplify stakeholder groups as participants in the problem of fuel poverty. The resulting effect of this is that representation and participation in government is diluted whilst at the same time risking damaging social equity through inaccurate representation of stakeholders whose rights and interests are unlikely to be suitably estimated in policy considerations.

Whilst Hills' final report maintains the recommendation to steer away from subjective measures of

fuel poverty, favouring instead objective and more quantifiable measures, this lack of identification, prioritisation and meaningful engagement with core fuel poverty stakeholder groups is likely to result in a continuation of misguided policy decisions and intervention targeting.

The current approach to fuel poverty is characterised by a top down attitude whereby government, academics, campaign groups and other interested parties 'know what's best'. As has been identified by Fahmy et al., (2011), there is no significant overlap between those identified by objective measures as living in fuel poverty and those self-reporting as facing difficulties with fuel poverty. This raises the question as to whether the current approach and that suggested by the Hills review (Hills, 2012) will empower policy makers and strategists to develop interventions that will meaningfully reduce the numbers in fuel poverty.

Without engagement with fuel poverty stakeholder groups, particularly those living with fuel poverty on a daily basis, it is unlikely that an accurate picture of the extent, depth and experience of fuel poverty will be captured. Inevitably policies are designed to reduce reported fuel poverty figures, but measures based on expert opinions and objective data are unlikely to tackle the root causes of fuel poverty.

By exposing the subjective experiences of fuel poverty, engaging with those involved with tackling fuel poverty at all levels of intervention from practical to strategic policy and combining this with objective measures of fuel poverty, a more accurate and meaningful measure of fuel poverty can be created. Whilst potentially a complicated measure, reflecting the complex nature and interactions of fuel poverty, the new measure will be meaningful to stakeholder groups allowing for the design of policy and intervention that will realise significant reduction and the hopeful eradication of fuel poverty.

Changing Directions

Towards a new paradigm of fuel poverty policy, intervention and research.

This report has provided a brief overview of the concept of fuel poverty from its emergence following the oil crises in the early 1970's through to the recent Hills review. In doing so it has highlighted some of the challenges facing the UK and increasingly other nations globally in tackling the physical, health and social problems that are associated with fuel poverty.

Britain is characterised by a low building turnover rate, with a preference for living in older housing. Arguably this significantly exacerbates the challenge of tackling fuel poverty in the UK. Whilst this preference provides for a rich architectural heritage with a diverse range of housing, over 50% of the population live in houses that were built prior to the introduction of thermal standards. A post-industrial revolution policy preference for social housing with air-circulation and space, built at speed rather than with precision has left the UK with a thermally inefficient housing stock, prone to damp that due to our temperate climate needs heating for up to 9 months of the year.

As stated by Edward Davey, Secretary of State for Energy and Climate Change on the publication of the final report of the Hills Review.

> 'The evidence is overwhelming that improving the way we measure fuel poverty is integral to delivering the right policy outcomes. Without the right measure it will not be possible to focus available resources in the most effective way, proving that measurement matters and is far from a distraction away from action on the ground.'
>
> (Davey, 2012)

Current and suggested approaches to fuel poverty measurement are characterised by economical and technical measures based on objective data. Although the current measure can be seen as relatively simple, its sensitivity to change in energy price and potential inclusion of those not classed as low income undermines its usefulness for the tackling of fuel poverty. Professor Hills' suggested alternative captures many of the benefits of the current measure whilst adding increased clarity through the inclusion of separate measures for depth and extent of fuel poverty and a refocusing towards low income, high energy cost households as was the original intention of the Warm Homes and Energy Conservation act (Great Britain, 2000).

Whilst the Hills fuel poverty measure offers a number of benefits, when combined with the UK government's flagship Green Deal and ECO policy, introduced through the Energy act (Great Britain, 2011) it is unlikely that a reduction in vulnerable households in fuel poverty will be realised given their characterisation as homes that traditionally under-heat at present. Similarly, through the inclusion of only objective measures of fuel poverty, this measure of fuel poverty may fail to capture a significant proportion of the population who consider themselves to be in fuel poverty subjectively, but aren't categorised as living in fuel poverty according to objective measures, resulting in a mismatch between ECO funds targeting and those households that need the most support.

In order to take the most effective approach to tackling fuel poverty it is necessary to continue to revisit the definition of fuel poverty and improve its accuracy to enable suitable policy development and intervention. Many policy documents and other fuel poverty literature refer to the concept of stakeholders, but with no definition of what they mean by this or who they are. Instead they take a homogenised approach to those who may have an interest in fuel poverty. It seems logical, given the current recognition of the concept of fuel poverty stakeholders as well as their experience of fuel poverty, to include the stakeholder in the re-definition of fuel poverty, but in a more structured and transparent manner.

Through the inclusion of stakeholder perspectives via their first hand experience of living or dealing with fuel poverty at both a practical and a strategic level a more detailed measure of fuel poverty can be developed that will not only allow future policy and interventions to be more accurately

targeted towards the most needy households but also capture more precisely the impact of policies such as the Green Deal and ECO in the reduction of fuel poverty.

To move towards this new paradigm of fuel poverty measurement requires a grass-roots approach to the conceptualisation of fuel poverty. The first step is to identify who the stakeholders in the concept of fuel poverty are, from the perspective of the creation of policy. This research will require a combination of qualitative and quantitative research to accurately map all fuel poverty stakeholders and avoid the problems associated with misspecification of stakeholders. Once identified, stakeholders needed prioritising and mapping to understand their relative stakes in the concept and the degree of consideration that must be extended to them in the development of both the new measure of fuel poverty and policy.

Only when the stakeholders in fuel poverty have been identified, mapped and prioritised can meaningful work commence on developing a more complete measure of fuel poverty. Through engagement with stakeholders and other traditional quantitative methods it is envisaged that a new measure of fuel poverty that is meaningful to stakeholders, maps fuel poverty accurately and enables appropriate direction of resources for tackling fuel poverty can be realised.

Finally, through systematic modelling utilising data sources from national statistics and other stakeholder groups, the new measure can be verified and brought into practice . This new measure will offer a more accurate picture of fuel poverty, the associated health, housing and social issues, effects upon policy and guidance in the creation of policy and practical interventions that will enable eradication of fuel poverty in the near future.

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