

Chapter 5

Fuel Poverty: Characterising a Complex Problem from Survey Data and the Lived Experience

Key Points

Fuel poverty results from, and exerts influence on, a wide range of inter-related but distinct problems and cannot be sensibly addressed in isolation from these factors

The current focus of fuel poverty policy - improving the housing stock's energy efficiency - does not address all these factors

By focusing on 'required' (modelled) energy expenditures, the two official fuel poverty statistics miss important behavioural factors

Fuel poverty rates appear higher in social housing when based on reported rather than required energy expenditures

The official Low Income-High Cost (LIHC) fuel poverty statistic may underestimate problems among some social housing tenants struggling to afford warmth

Survey data indicate that fuel poverty is more episodic than a basic measure of income poverty

Fuel poverty has proved a challenging concept to operationalise, so the meaning and appropriateness of official fuel poverty statistics remains contested

Focusing on multiple specific and directly observable issues affecting individual households, e.g. low income, precarious employment, cold homes, may present a better way forward

1 Introduction

'Fuel Poverty' is often used as a frame for discussing fairness in the retail energy market. Such a framing extends beyond the retail energy market, while not necessarily addressing all issues of concern within the market. Fuel Poverty (FP)¹ is defined in the Warm Homes and Energy Conservation Act 2000 as: "a household living on a lower income in a home which cannot be kept warm at reasonable cost".² However, often a broader definition is used covering the affordability of all energy services in the home.³ Both definitions incorporate several links between the retail energy market and FP, including energy prices, payment methods, debt recovery policies, and any affordability support schemes delivered by energy retailers.

Operationalising FP into meaningful statistical indicators has proved challenging and remains subject to considerable debate. We provide additional, and often improved, evidence highlighting the uncertainties around existing FP indicators. This evidence is presented in this chapter and Chapter 6.

Rather than using a single statistic to represent FP, we suggest that FP should be viewed as a symptom of several underlying problems. Each real-world phenomenon can then be assessed individually, together with the extent to which society wishes to alleviate it and which interventions can resolve the issue most effectively at least cost. If the main concern, for example, is households living in the cold, it seems desirable to focus on this directly rather than the more nebulous term of FP. We wish to stress that, while FP statistics are problematic, issues of deprivation still warrant further investigation and policy measures.

The current chapter focuses on two main issues. First, the official Low Income-High Cost (LIHC) indicator may omit some households who struggle to afford energy services, in particular some social housing tenants. Our evidence raises questions about the ability of energy efficiency interventions to address FP effectively, though we recognise energy efficiency's contribution to reducing FP's severity in individual households. Second, we show that for many households FP is episodic, often resulting from negative income shocks. For these households there may be more effective interventions than energy efficiency retrofits.

As background to the evidence itself, we first outline the two official FP statistics that have been used in England.

In the first UK government's FP strategy the statistical FP definition was the '10% metric': a household was FP if their required energy expenditures (ENEX) exceeded 10% of household income. Following the Hills Review,⁴ the LIHC indicator was adopted in England, which classifies a household as FP if: (a) their required ENEX exceeds the national median; and (b) their income, after the deduction of required ENEX, lies below the income poverty threshold, which is currently 60% of median income. In this LIHC definition, income is calculated after the deduction of housing costs and is equivalised to adjust for the number of household occupants. The LIHC indicator is a 'relative' metric, since the classification of FP depends on a household's position relative to the average. Alongside the headline LIHC FP rate, a second indicator describes the 'FP gap', which is the monetary amount required to take a household out of LIHC FP. Figure 1 illustrates the LIHC indicator.

1 We also use FP to denote 'fuel poor'.

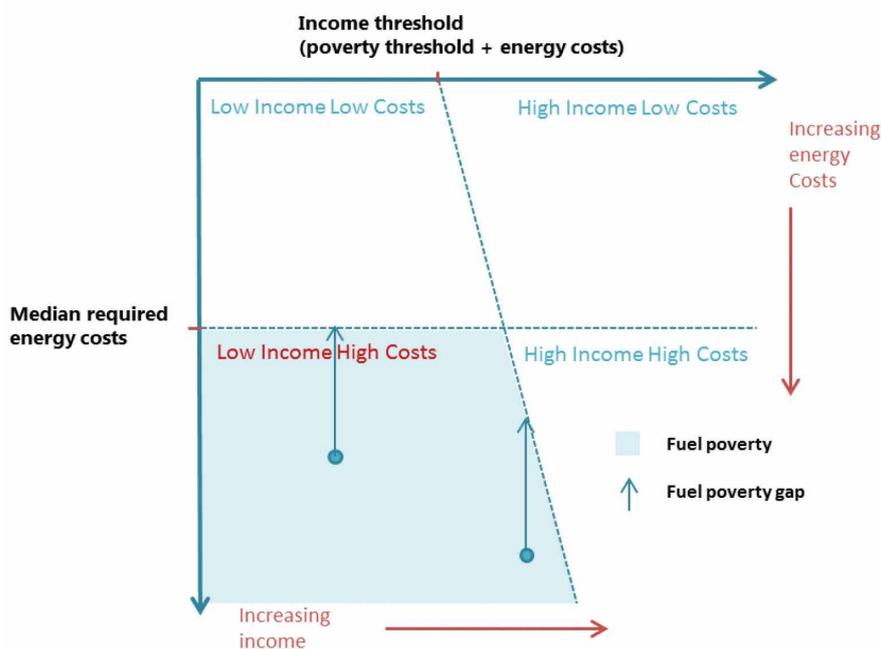
2 Paragraph 1(1), Warm Homes and Energy Conservation Act 2000, available at: <http://www.legislation.gov.uk/ukpga/2000/31> (last accessed 06.8.18)

3 Example, see Thomson and Snell (2013)

4 Hills (2012)

Figure 1 Classifying households according to the Low Income-High Cost (LIHC) FP indicator

(Source: Department for Business, Energy and Industrial Strategy)⁵



Official FP statistics are based on ‘required’ ENEX, the estimated ENEX needed to maintain a specified temperature⁶ based on an engineering model incorporating the detailed physical characteristics of a dwelling. This in turn requires a comprehensive dwelling survey, making it difficult for practitioners to identify households that are officially FP, and leading many researchers, as in this study, to base FP analysis on households’ reported ENEX.

The relationship between FP rates using reported and required ENEX is complex. Moreover perception-based indicators,⁷ such as an inability to afford to keep one’s home adequately warm, show limited overlap with the 10% and LIHC indicators when these are based on reported ENEX. Chapter 6 provides evidence on both of these issues.

⁵ Pg7, BEIS (2018)

⁶ In England, the required temperature is 21°C in a primary zone and 18°C in a secondary zone.

⁷ We use ‘perception-based’ to refer to indicators often labelled ‘subjective’, and ENEX-based to refer to indicators others have labelled ‘objective’. The perception-based indicators result from households’ agreement or disagreement with statements included in surveys.

Since the official FP definitions are based on engineering models of dwellings, and assumptions about ‘optimal’ temperatures, any households preferring lower temperatures (than assumed in the modelling) may be wrongly classified as FP. For other FP households there are a range of factors, including housing choices, the condition of heating facilities and behavioural responses that contribute to complex and shifting issues extending beyond energy efficiency. Taking this more holistic approach provides a way forward for FP research and policymaking: rather than constructing a single FP statistic, the frequency of each real-world phenomena of concern could be assessed, and the relationships between these phenomenon and household characteristics could be explored. Such an approach reflects the complex reality of FP and should help policymakers to design and deliver effective interventions.

2 Fuel Poverty and Social Housing

Since 2015, the official FP target has been expressed in terms of an energy efficiency rating: as many FP homes as is reasonably practicable will have a minimum energy efficiency rating of C by 2030.⁸ This target focuses on, and can be achieved by, installing technology rather than by demonstrating a significant improvement in households’ welfare, despite the latter seeming a more appropriate focus.

2.1 Official FP statistics may understate affordability issues in social housing

Over the last two decades there has been a concerted drive to improve the energy efficiency of social housing through initiatives such as the Decent Homes Programme which was applied to 1.2 million properties.⁹ Social housing providers have also had access to energy efficiency programmes such as the Carbon Emissions Reduction Target (CERT) and the Energy Company Obligation (ECO). These ‘retrofit’ improvements are often presented as a win-win in terms of addressing both FP and decarbonisation targets¹⁰ which reinforces a policy narrative that improving energy efficiency is the most effective way to address FP.¹¹

Reflecting the investment in energy efficiency, social housing has the highest energy efficiency (SAP ratings) of all tenures, as illustrated in Figure 2. Since official FP statistics use required ENEX, households with higher energy efficiency ratings are less likely to be identified as FP. The LIHC metric may further reduce the likelihood of tenants in energy efficient housing being identified as FP: if required ENEX is below the median, the LIHC metric will not identify the household as FP, however low a household’s income. If official FP statistics are used to guide energy affordability support policies, households in genuine difficulties may be excluded from help.

8 Pg12, HM Government (2015). The ‘Standard Assessment Procedure’ places properties’ energy performance on a scale of 1-100, with A-G categories within this scale. ‘A’ rated properties have higher energy efficiency than ‘G’ rated properties. Ratings are linked to modelled running costs based on standardised assumptions about occupancy and behaviour.

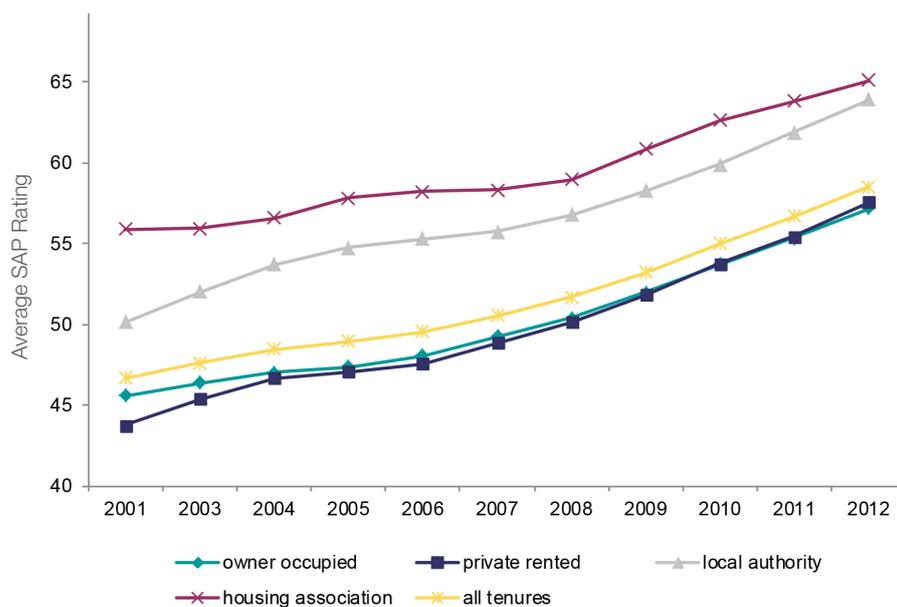
9 Paragraph 5, pg6, National Audit Office (2010)

10 See Swan et al (2017) and Abdel-Wahab et al (2011). In practice, a policy maximising FP reductions is likely to require interventions rather different to a policy seeking to maximise CO2 reductions.

11 See Middlemiss (2017)

Figure 2 Average energy efficiency (SAP) rating by tenure, 2001-2012

(Source: Department for Communities and Local Government)¹²



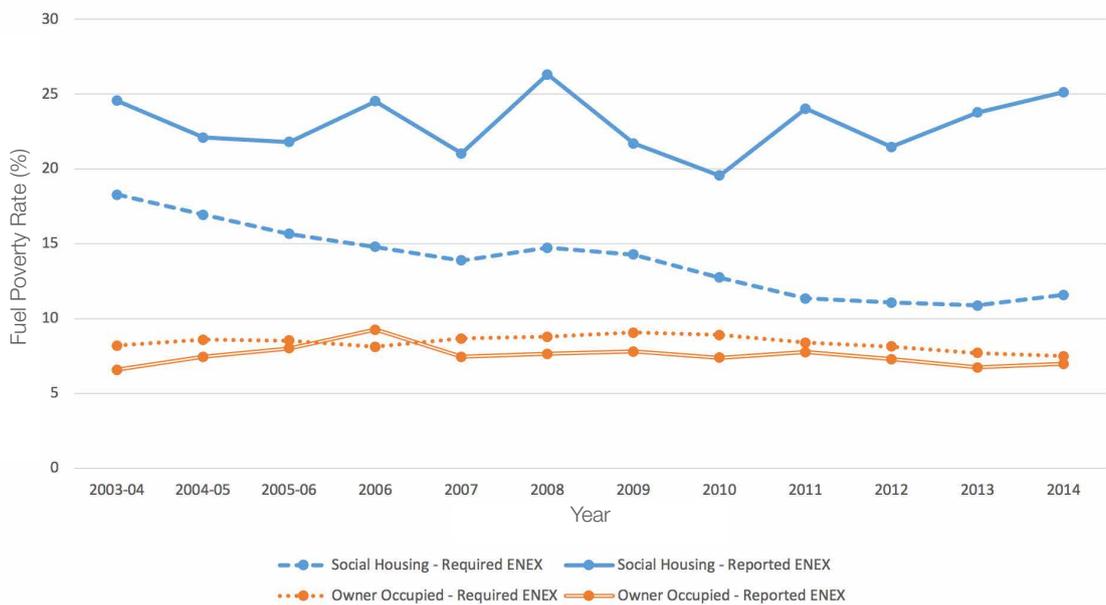
A further concern arises from any inaccuracies with the model which converts energy efficiency features into required ENEX. Figure 3 shows that our¹³ central estimate of LIHC FP using reported ENEX is substantially above the official required ENEX FP rate for social housing. That a large gap exists for social housing (but not for owner occupiers), and social housing has higher SAP ratings in Figure 2, potentially suggests the reduction in ENEX resulting from energy efficiency measures may have been over-estimated in the model generating the official FP statistics. Section 3.2 in Chapter 6 discusses how this issue could be definitively evaluated.

¹² Figure 1.1, DCLG (2014)

¹³ Deller and Waddams Price (2018b). A similar result is found when using the 10% metric. Details of our research papers' methodologies are provided in Appendix 1.

Figure 3 LIHC fuel poverty rates in England based on reported and required energy expenditures for social housing and owner occupiers, 2003-04 to 2014

(Data: Reported ENEX FP - Living Costs and Food Survey and precursors,¹⁴
Required ENEX FP – Department for Energy and Climate Change¹⁵)



Regarding the role of low incomes, our analysis¹⁶ of Living Costs and Food Survey data involving reported ENEX shows social housing tenants consistently have the highest energy expenditure shares (ENEXShr) of all tenure types between 1992 and 2005 (Figure 4), despite the efforts to improve the energy efficiency of the social housing stock. Figure 5 shows that since 2000-01 social housing tenants' median ENEX has been broadly in line with that of private renters. Together, Figures 4 and 5 indicate the higher ENEXShr of social housing is driven primarily by low income (total expenditure) rather than higher ENEX.

¹⁴ Deller and Waddams Price (2018b)

¹⁵ 'Trends in Fuel Poverty, England, 2003 to 2014', Department for Energy and Climate Change (DECC), <https://www.gov.uk/government/statistics/fuel-poverty-trends-2003-2014>

¹⁶ Deller and Waddams Price (2018a)

Figure 4 Median energy expenditure shares¹⁷ by household tenure, 1992-2014

(Data: Living Costs and Food Survey and precursors)¹⁸

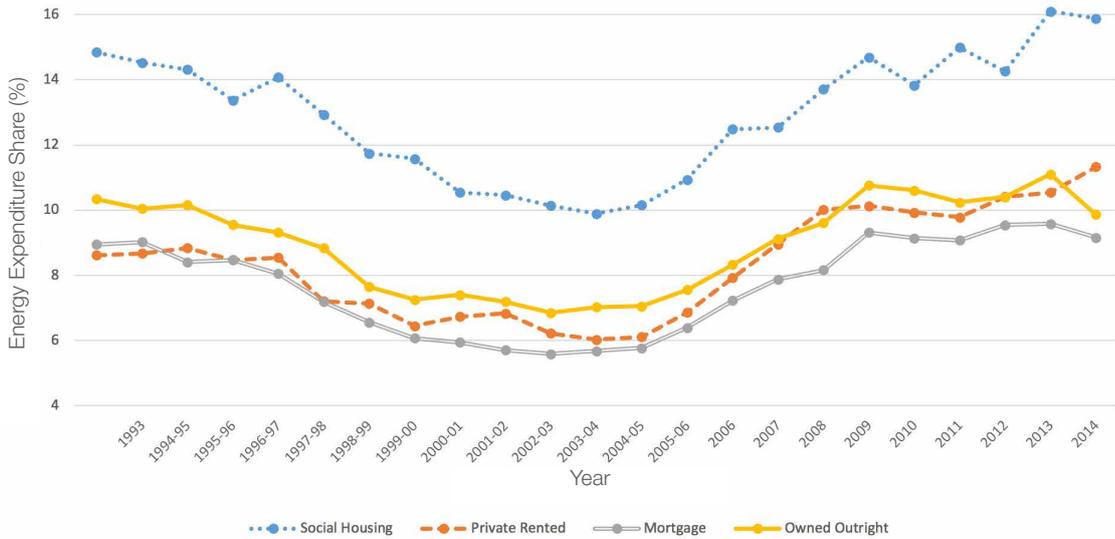
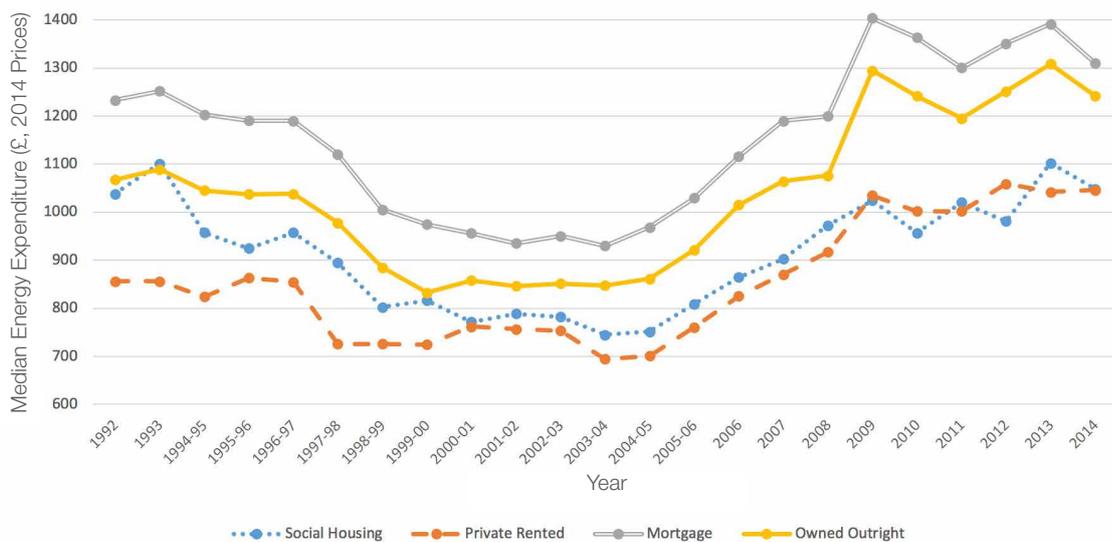


Figure 5 Median energy expenditures by household tenure, 1992-2014

(Data: Living Costs and Food Survey and precursors)¹⁹



17 Energy expenditure as a proportion of total household expenditure after the deduction of housing costs and equalisation.

18 Deller and Waddams Price (2018a)

19 Deller and Waddams Price (2018a). 2014 prices calculated using the Retail Price Index (RPI).

2.2 Some social housing tenants struggle to maintain warmth

Since some social housing tenants may be missed by official FP indicators, we²⁰ conducted in-depth interviews with a selection of tenants to explore the issues involved. Broadland Housing Association (BHA) in the East of England has a strategy of helping tenants to avoid FP by improving their housing stock through replacing boilers, installing insulation, and commissioning highly energy efficient new build properties. BHA calculates that their properties have an average SAP rating of 71.1, although they report that 29.9% of their tenants experience '10% FP'.

In twelve out of fifteen interviewed households²¹ tenants took steps to keep their ENEX as low as possible, such as through spatial and temporal 'rationing' of energy use (e.g. heating only one room, often for very short periods), by wrapping themselves in duvets or visiting others to warm up. Susan (Box 1) is a tenant who combines high ENEX with routines of limiting energy consumption. Box 2 shows that interviewees who were not rationing their energy use often faced other difficult choices such as limiting food expenditure. Our findings²² suggest some tenants are spending less than they would like to on energy while still facing a high ENEXShr.

Box 1 Susan - Coping with inefficient heating

Susan is a single parent and part-time child-minder who lives with her school-age daughter in a 'D' SAP rated home that is not connected to the gas grid. She uses storage heaters and, after experiencing high bills (around £40 per week) and getting into debt, she contacted Broadland Housing who helped her with budgeting and undertook an energy audit. After the audit, and having seen some advice from Martin Lewis, the 'Money Saving Expert', she switched supplier allowing her to have her Pre-Payment Meter removed for free and to move onto lower-rate quarterly bills. She still takes several measures to reduce her energy consumption to avoid high bills, such as only cooking in large batches and taking advantage of her Economy 7 tariff by only using her washing machine and dishwasher after midnight. She is waiting for a smart meter to be installed so she can know exactly what she is using.

3 The Persistence (or not) of Fuel Poverty within Households

A topic receiving limited attention to date is the time households remain in FP. If FP is primarily a dynamic phenomenon, it raises questions about whether energy efficiency retrofits, which permanently alter dwellings, are the most appropriate FP intervention.

²⁰ Hargreaves and Longhurst (2018)

²¹ Interviews focused on households likely to be at risk of FP.

²² Hargreaves and Longhurst (2018)

3.1 FP often appears to be a dynamic and changing phenomenon

The qualitative data illustrate the dynamic and changing nature of FP, often triggered by financial shocks such as becoming unemployed. One example is Michael (Box 2), whose unemployment was compounded by a loss of housing benefit, leading to a rapid accumulation of debt, including significant energy debt. Tenants in arrears with their housing payments often trigger intervention from the BHA tenant support team, which can lead to improvements in the tenant's situation through securing additional income, or the writing off of debt. However such forms of support (from grant-making trusts and energy suppliers) are discretionary and, it was reported, increasingly difficult to secure.

Box 2 Michael - Struggling with changing benefits, unemployment and childcare

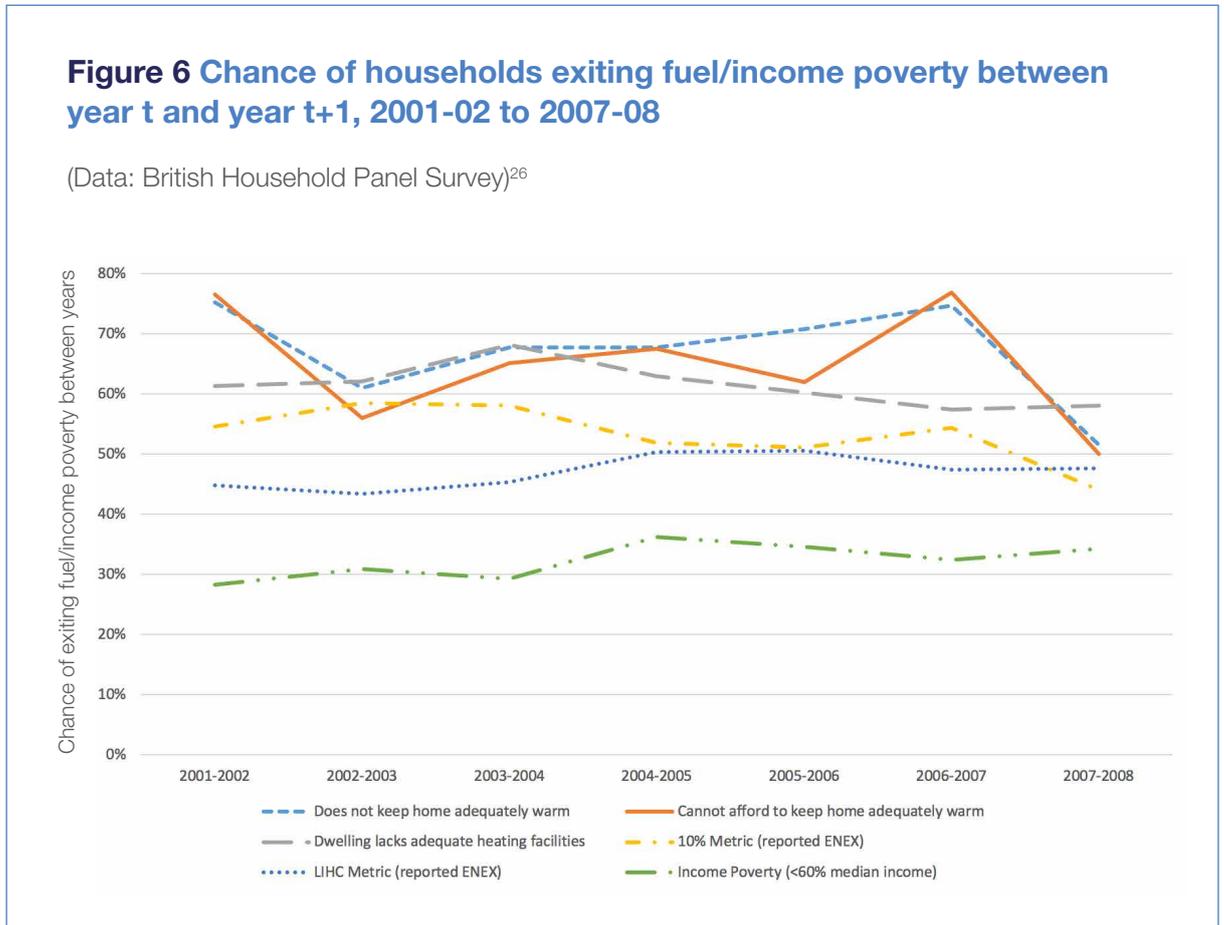
Michael is an unemployed single father, who lives with his four children in a 1970s terraced house. He recently lost his housing benefit, seeing it cut from £400 to just £2. He now owes Broadland Housing £1,200 in rent arrears. He is a trained builder and used to work in a local factory, but is now finding it hard to get work, partly because he needs to take his children to and from school, which requires two buses. As a result, his debts and unpaid bills are increasing. He gets his gas bill quarterly and his debt has been put onto his electricity key, with his supplier taking £5-6 per week in repayments. He receives the Warm Home Discount and some credits from his supplier. He has had some loans from a friend and uses a food bank, but at this point does not cut back on his energy consumption.

The dynamics and duration of FP can also be explored using the British Household Panel Survey (BHPS)²³ which tracks individual households through time. Variability in FP status can be indicated by the 'exit probability', i.e. the probability that a household which is in FP in one year will no longer be in FP by the following year. Figure 6 charts exit probabilities for five alternative FP indicators, with income poverty²⁴ as a comparator.²⁵ Both the perception-based and ENEX-based FP indicators have exit probabilities noticeably higher than for income poverty; and for all three perception-based FP indicators in all years at least half of households who identified as FP in one year no longer did so by the following year.

²³ Deller, Turner and Waddams Price (2019). Figure 6 and Figure 7 use data from the whole of the UK, including Northern Ireland.

²⁴ Defined as households where income is below 60% of the median.

²⁵ To be included in Figure 6, households only had to be present in two consecutive survey waves (years).



Another way of illustrating the persistence of FP is through how often households²⁷ were identified as FP by the alternative indicators. Figure 7 shows that, for the perception-based indicators, just over 60% of those reporting FP at least once did so only once, and that over 80% reported it in only one or two years. The LIHC metric shows more persistence, likely because of its relative nature.

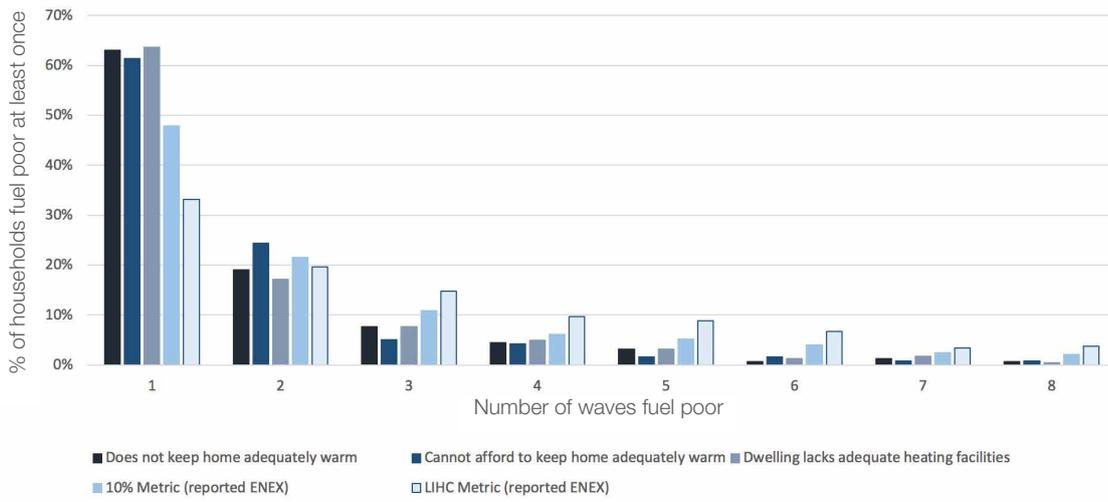
Equally, the BHPS analysis should be interpreted with some caution. First, the BHPS statistics cover a period of lower average ENEX than today. Second, especially in Figure 7, the results may be influenced by attrition, i.e. the poorest and least stable households, who are likely to be at particular risk of persistent FP, may be more likely to drop out of the sample. Third, we do not know what support (if any) households received while FP. Evidence from the quantitative and qualitative research potentially reveals the different forms that FP may take: dynamic or chronic.

²⁶ Deller, Turner and Waddams Price (2019). Figures 6 and 7 use unweighted data.

²⁷ This measure was restricted to those households present in all eight waves (years) of the BHPS data we analysed.

Figure 7 Number of periods households were identified as fuel poor (conditional on being fuel poor at least once and present in all survey waves 2001-02 to 2008-09)

(Data: British Household Panel Survey)²⁸



3.2 Some households struggle to afford warmth over the long-run

Our qualitative analysis²⁹ suggests longer term 'chronic' cases of FP are often driven by persistent low incomes, though technical factors can exacerbate the situation. Long-run energy affordability challenges were particularly apparent in single person unemployed households where the primary income was Employment Support or Job Seekers Allowance (£3,010 - £3,801 per year). Colin (Box 3) used ongoing efforts to restrict energy consumption and multiple ways of coping, despite living in a modern property with high SAP ratings and access to mains gas.

Box 3 Colin - Rationing energy use

Colin is an unemployed single man with an income of £73 per week through Employment Support Allowance. He lives in an efficient, 'B' rated home, but, despite this, to cope with his low income, he takes significant measures to limit his energy use. For example, wearing extra clothes, having baths or visiting friends to keep warm, relying on light from the TV rather than using room lights, heating water for just 30 minutes each day and microwaving food rather than using his gas cooker. He pays for energy using a Pre-Payment Meter which, although more expensive, allows him to control his expenditure. He has little knowledge of how to switch provider and limited IT skills, but also feels loyal to his provider as they have given him some small rebates in the past. Broadland Housing are trying to help him by seeking the Warm Homes Discount and boosting his employability skills.

²⁸ Deller, Turner and Waddams Price (2019)

²⁹ Hargreaves and Longhurst (2018)

Susan's experience (Box 1, p66) shows the influence of technological issues. Also, Susan's energy costs were increased by use of a pre-payment meter (PPM). These factors, combined with home working, led Susan to spend around £40 per week on energy, despite her attempts to limit consumption.

As well as distinguishing between dynamic and chronic FP, the qualitative data also suggest a distinction between controlled and uncontrolled situations. In many cases of persistent FP households have patterns of consumption and ways of coping that are relatively stable and manageable, albeit involving less energy usage than the household would ideally choose.

In contrast, uncontrolled cases, such as Michael (Box 2, p67), reflect situations where current ENEX is unaffordable, leading to a build-up of energy related debt, which often occurs as a household experiences a generally deteriorating financial situation. The burden of debt repayments eating into households' disposable income is not reflected directly in FP statistics. Difficulties may be exacerbated by the method for recovering energy debt. Many struggling households have PPMs, where a proportion of any amount they 'top-up' goes to repaying their debt rather than purchasing new energy. These 'forced' debt repayments, while limiting the bad debt costs falling on other energy consumers, raise the effective price of energy within a home. A household's willingness to top up a PPM may be further reduced by a lack of clarity around how much of their top-up is used to pay off debt. If users do not know how much will be taken for debt when they top-up, they may choose to spend their limited funds elsewhere.

4 Conclusion

FP alleviation is currently heavily focused on improving the energy efficiency of the housing stock. While such an approach may help with climate change commitments, we present evidence suggesting that other approaches need consideration to improve the welfare of those who struggle with energy affordability. Both quantitative and qualitative evidence suggests that low incomes are often fundamental to households' energy affordability challenges and, while energy efficiency improvements should help, retrofits' ability to offset the consequences of low incomes is likely limited. Social housing presents an example where households may still struggle, despite relatively high levels of energy efficiency. This supports a case for going 'back to basics' when assessing energy affordability challenges. A more effective approach than a single measure of FP, would be measuring the extent of directly observable real-world phenomena experienced by households that raise concern. The case for intervention to resolve each issue can then be evaluated. Ofgem's³⁰ more nuanced regulatory understanding of consumers in vulnerable situations is welcome support for this approach.

References

- Abdel-Wahab, M., D. Moore and S. MacDonald, 2011. Exploring the adoption of low carbon technologies by Scottish housing associations, *International Journal of Low Carbon Technologies*, 6, pp. 318-323
- Department for Business, Energy and Industrial Strategy (BEIS), 2018. Annual Fuel Poverty Statistics Report, 2018 (2016 Data): England, Statistical Release: National Statistics, June 2018, London, available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/719106/Fuel_Poverty_Statistics_Report_2018.pdf (last accessed: 06.08.18)
- Department for Communities and Local Government (DCLG), 2014. English Housing Survey: ENERGY EFFICIENCY OF ENGLISH HOUSING 2012, July 2014, available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/335756/EHS_Energy_efficiency_of_English_housing_2012.pdf
- Deller, D. and C. Waddams Price, 2018a. Energy Affordability in the UK: Corrected Energy Expenditure Shares 1992-2014, CCP Working Paper 18-8, Centre for Competition Policy, University of East Anglia, Norwich
- Deller, D. and C. Waddams Price, 2018b. Comparing English Fuel Poverty Rates: Reported vs Modelled Expenditure, CCP Working Paper 18-11, Centre for Competition Policy, University of East Anglia, Norwich
- Deller, D., G. Turner and C. Waddams Price, 2019. Discrepancies between Perception- and Expenditure-based Fuel Poverty Indicators over Time, CCP Working Paper 19-1, Centre for Competition Policy, University of East Anglia, Norwich
- Hargreaves, T. and N. Longhurst, 2018. The lived experience of energy vulnerability among social housing tenants: emotional and subjective engagements, 3S Working Paper 18-32/CCP Working Paper 18-7, Centre for Competition Policy, Norwich
- Hills, J., 2012. Getting the measure of fuel poverty: Final report of the Fuel Poverty Review, Centre for the Analysis of Social Exclusion, CASE report 72, March 2012, London School of Economics and Political Science, available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/48297/4662-getting-measure-fuel-pov-final-hills-rpt.pdf (last accessed 06.08.18)
- Her Majesty's Government, 2015. 'Cutting the cost of keeping warm: A fuel poverty strategy for England', March 2015, URN 15D/062, London, available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/408644/cutting_the_cost_of_keeping_warm.pdf (last accessed 06.08.18)
- Middlemiss, L., 2017. A critical analysis of the new politics of fuel poverty in England, *Critical Social Policy*, 37(3), pp. 425-443
- National Audit Office, 2010. The Decent Homes Programme: Summary, Report by the Comptroller and Auditor General, HC Session 2009-2010, 21 January 2010, London, available at: <https://www.nao.org.uk/wp-content/uploads/2010/01/0910212es.pdf> (last accessed 06.08.18)
- Ofgem, 2013. Consumer Vulnerability Strategy – Final decision, Ref 102/13, 4 July 2013, London. Available at: https://www.ofgem.gov.uk/sites/default/files/docs/2013/07/consumer-vulnerability-strategy_0.pdf (last accessed 06.08.18)
- Swan, W., R. Fitton, L. Smith, C. Abbott, and L. Smith, 2015. The adoption of sustainable retrofit in UK social housing 2010 – 2015, *International Journal of Building Pathology and Adaption*, 35(5), pp. 456 – 469
- Thomson, H. and C. Snell, 2013. Quantifying the prevalence of fuel poverty across the European Union, *Energy Policy*, 52, pp. 563-572