



Committee on
Fuel Poverty



Understanding the barriers and enablers to supporting fuel poor households achieve net zero

Report for the Committee on Fuel Poverty

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Foreword

Thank you to the Centre for Sustainable Energy for producing this research. It was commissioned by the Committee on Fuel Poverty to look more deeply at what would improve the delivery of energy efficiency schemes and bring clarity on what a fair transition to net zero could look like for fuel poor households.

It is challenging to know how any given household will transition to net zero, let alone those households in fuel poverty. The choices between existing and emerging technologies for home use are complex, and the costs of appliance replacement or change are out of reach for many during what is likely to be a sustained period of high energy bills. As fuel poor households are disproportionately affected, it is crucial that in a fair transition further increases in energy costs are minimised for them. Energy efficiency has a significant role to play in the transition to net zero as well as reducing fuel poverty and should be a priority for policymakers.

This research demonstrates a gap between the aspiration for a fair transition and the impact of energy efficiency schemes to date for those least able to pay. It highlights the increased scale and pace of delivering energy efficiency measures to fuel poor households needed to ensure they are not left behind in efforts to tackle climate change.

Stakeholders told the research team that a reduction in additional costs associated with the installation of energy efficient measures, along with better targeted schemes for fuel poor households, will be necessary but not sufficient for the net zero transition. We agree that a 'people focused' approach is fundamental for schemes to be successful, taking account of the complexities of people's lives, as well as living in different housing tenures, such as the challenging private rented sector. More accurate and better use of data can inform targeting, approaches, and delivery of schemes alongside essential monitoring and evaluating of drop-out rates to better understand what works.

We thank all stakeholders whose research contributed to the literature review and to all those who participated in workshops and interviews, making this research possible.

The Committee on Fuel Poverty

Glossary of terms

Acronym / initialism	Term / example
ASHP	Air Source Heat Pump
DESNZ	Department for Energy Security and Net Zero
DNO	Distribution Network Operator
DLUHC	Department for Levelling Up Housing and Communities
DWP	Department for Work and Pensions
DHSC	Department for Health and Social Care
ECO	Energy Company Obligation
FPEER	Fuel Poverty Energy Efficiency Rating, a housing property rating method like SAP. Used to measure the energy efficiency of fuel poor households in England. Applied solely to the housing survey data used for compiling and preparing the Annual Fuel Poverty Statistics.
GBIS	Great British Insulation Scheme
GHGV	Green Home Grant Voucher scheme
HUG	Home Upgrade Grant scheme
LAD	Green Home Grant Local Authority Delivery scheme
LILEE fuel poverty indicator	A household is considered to be fuel poor if: they are living in a home below Band C and were they to spend the required amount on fuel costs for the home, they would be left with a residual income below the official poverty line.
NHS	National Health Service
ONS	Office for National Statistics
PAS 2030 / 2035	Publicly Available Specification (PAS) 2035 is the British standard for retrofitting dwellings, required for all government-funded retrofit programmes in England and Wales.
PRS	Private Rental Sector
PSR	Priority Service Register
RHI	Renewable Heat Incentive
SAP	Standard Assessment Procedure
SHDF	Social Housing Decarbonisation Fund
Solar PV	Solar Photovoltaic (solar panel)
VOA	Valuation Office Agency. Gives the government the valuations and property advice needed to support taxation and benefits.
WHR	Whole house retrofit

Executive Summary

Introduction

This study was commissioned by the Department for Energy Security and Net Zero (DESNZ) on behalf of the Committee on Fuel Poverty. The research explored the barriers and enablers for fuel poor households in the net zero transition,¹ and the role of government energy efficiency schemes in England.²

Reaching net zero, improving energy efficiency and addressing fuel poverty are deeply intertwined and cannot be siloed to ensure a fair and just energy transition. Improving energy efficiency remains a key tool to support fuel poverty reduction, as well as in cutting carbon emissions by reducing energy demand from the UK's housing stock. As the UK transitions to net zero, consideration needs to be given to fuel poor households to ensure they are not left behind, or even further disadvantaged as a new energy system emerges.

Challenges in transitioning to net zero are currently prevalent across all households in England. While the findings of this report may have broader applicability, the research specifically focuses on fuel poor households and energy efficiency schemes targeting the fuel poor.

Methodology

The evidence underpinning this report was collected via several methods. A literature review was conducted to start answering the research questions and identify knowledge gaps. Following this, 37 interviews were conducted with a variety of expert stakeholders, as well as fuel poor households who had received support from an energy efficiency scheme. Six deliberative workshops³ were also held with expert stakeholders and fuel poor households to gain further insights and to sense-check the research findings. Thematic analysis of transcripts from interviews and workshops were compared and triangulated with results from the literature review and combined to address the research questions.

The transition of fuel poor households to net zero

The research has found that the transition of fuel poor households to net zero is a challenging issue, which requires collaboration across a variety of actors to successfully address it. This creates a complex scenario akin to adding another layer to the existing 'energy trilemma' – the need for a balanced response to the sustainability (decarbonisation), security (secure, reliable supplies) and affordability of energy. Efforts to reduce carbon emissions and improve energy

¹ The term 'net zero transition' used in this report refers specifically to the decarbonisation of homes.

² Fuel poverty is a devolved matter across the four UK nations. Each nation uses different metrics to measure fuel poverty.

³ Workshops were divided on the following themes: (1) National, local authority and social housing; (2) Social housing; (3) Independent advice organisation, installer, retrofit coordination; (4) Private rental sector; (5) Retrofit; (6) Fuel poor households.

efficiency must be balanced with the need to ensure that fuel poor households are not left behind in the transition to net zero.

The research has identified a range of barriers that limit the ability of any household in England to transition to net zero. For fuel poor households, additional costs associated with the installation of energy efficiency measures combined with uncertainty around running costs of low carbon technologies were found to make the net zero transition unaffordable. Lack of time and cognitive bandwidth (due to stress or chaotic lifestyles) limited some fuel poor households' ability to engage with net zero and to make energy efficiency improvements. The transition to net zero is not a priority for fuel poor households in the cost-of-living crisis. Limited knowledge and awareness of net zero and inconsistent access to advice are other barriers which allow misinformation to spread. The retrofit process was not seen as fit for purpose, owing to a lack of long-term policy certainty or consistency. This was felt to impede the development of domestic energy efficiency retrofit and low carbon technology supply chains, which could result in fuel poor households struggling to get the support they needed. Lack of trust in schemes due to their short lifespans, mistrust of installers and long wait times for retrofit were also considered barriers to fuel poor households benefitting from energy efficiency improvements.

This research has highlighted multiple enabling factors that can help fuel poor households to transition to net zero. Removing hidden costs or additional expenses associated with the installation of energy efficiency measures and reducing electricity costs can minimise financial barriers faced by households. Enabling knowledge and awareness of net zero is crucial and can be achieved through access to tailored independent advice, as well as widespread promotion that is integrated into people's daily lives. Easily understandable messaging can tackle scepticism and positive word of mouth through social connections can encourage take-up within a community. Improving the current retrofit process, for example by limiting the number of funding streams or shifting to a community-scale approach to delivery, would enable fuel poor households to transition.

Distinct solutions will be required for different tenure types. The research highlighted the private rental sector as being difficult to transition to net zero, with multiple barriers relating to tenant and landlord attitudes, regulation and policy. For example, a lack of financial incentives for landlords to improve their properties, along with the Minimum Energy Efficiency Standards (MEES) requirement remaining at EPC Band E and limited MEES enforcement does not support energy efficiency improvements in the private rental sector. A lack of national and area-wide landlord registers contributes to this sector having a higher proportion of dwellings in the lowest two EPC bands and with higher levels of fuel poverty.⁴ Bespoke financing could combat the 'split incentive' that results in landlords investing, but tenants benefitting from reduced running costs. In social housing, where on the whole properties are more energy efficient, tenant engagement can be a challenge. Social housing landlords reported that the time and labour-intensive nature of engaging tenants was not covered in scheme budgets. Doing so could aid inclusion of tenants with multiple vulnerabilities. For owner occupiers, retrofit experts stated that

⁴ English Housing Survey 2022-2023; DESNZ (2024) Annual Fuel Poverty Statistics in England, 2024 (2023 data), Available at: [Annual fuel poverty statistics in England, 2024 \(2023 data\) \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/131422/annual-fuel-poverty-statistics-in-england-2024-2023-data.pdf)

initial information and support was needed to help households to take a first small step in improving their home, but once engaged they were likely to take the lead. Older cash poor mortgage-free owner occupiers might be reluctant to release equity from their home to fund energy efficiency improvements.

The role of energy efficiency schemes in tackling fuel poverty

Various schemes have been aiming to improve energy efficiency and tackle fuel poverty in the UK. This includes, but is not limited to, the Energy Company Obligation (ECO), the Home Upgrade Grant (HUG) and the Social Housing Decarbonisation Fund (SHDF). As part of this study, the barriers and enablers experienced by fuel poor households were mapped across the typical customer journey stages of an energy efficiency scheme. Eight key themes were identified that impact fuel poor households engaging in energy efficiency schemes. These themes spanned from attitudes and behaviours to the operational delivery of the scheme itself.

In the initial stages of the customer journey, knowledge, information and communication is critical. Households need to know what support is available and that they can put their trust in scheme providers. Hearing from others' experiences through social networks fills information gaps and can either be a positive or negative driving force. Additionally, more accurate data, and a better use of data overall, would improve targeting of households for scheme take-up.

As households progress through the customer journey, operational factors begin to play a bigger role. The research found that households could be frustrated by long lead times caused by lack of supply chain capacity or processing problems. Disruption could also act as a deterrent for households to participate. Time availability and scheduling issues could make it difficult for them to grant access to the property or arrange for installations to occur. Households may not want certain technologies or measures to be carried out; for example, the need for ventilation was mentioned frequently as something households were opposed to. More information about the need for ventilation in buildings and for healthy homes will be required to engage households in retrofit.

Towards the final stages of the customer journey, knowledge and information again becomes more prominent, as households face challenges in understanding how to operate their new technologies. Additionally, installations need to meet PAS 2035 standard⁵ and there needs to be clear access to recourse.

To support scheme take-up, building trust was considered important. Using community outreach at the initial engagement stage or working in partnership with trusted intermediaries (including the retrofit supply chain) were seen as effective ways to do this. Wraparound 'end-to-end' services that guide fuel poor households through the customer journey were considered key, and funding within scheme budgets necessary to enable this.

⁵ PAS (Publicly Available Specification) 2035 is the British standard for retrofitting dwellings, required for all government-funded retrofit programmes in England and Wales. <https://retrofitacademy.org/knowledge/pas-2035/>

Participation and role of government and other actors to reach the 2030 fuel poverty target

The fuel poverty target for England was established to ensure that as many fuel poor households as reasonably practicable achieve a minimum Fuel Poverty Energy Efficiency Rating (FPEER) of Band C by 2030, with interim targets of Band E by 2020, and Band D by 2025.⁶ Attaining the 2030 fuel poverty target depends on multiple actors working together to achieve this common goal. Findings from the literature, interviews and workshops highlighted suggested changes and approaches key actors could make to help achieve the target:

- National government needs to play a key role, setting clear and consistent policy direction that enables other actors to deliver confidently and effectively. Coordination across departments, providing sufficient funding and setting standards and regulation were considered actions the government could take to create a system which enables the 2030 fuel poverty target to be reached. It was also suggested that a government-led communication campaign could help to address knowledge and awareness gaps, signpost support, and tackle misinformation.
- Regional or local government level were considered best placed to deliver energy efficiency and retrofit measures, as they can draw on their knowledge and expertise of an area to coordinate effectively. Research findings highlighted that local government would require sufficient funding from national government to do this successfully, given financial and resource constraints faced by local authorities currently. Additionally, local independent advice services were seen as best placed to provide tailored advice for households. A key benefit identified from utilising this group was their ability to partner with other trusted intermediaries in the community, such as GP services or community centres, to support the roll-out of energy efficiency schemes within an area.
- Low carbon technology developers were also considered as having a role to play. They could make existing technology easier to use and improve technology available to provide better solutions for specific household or building types.⁷

Key recommendations

The following key recommendations have been developed based on the research results.

Recommendation 1. The intricacies of policy design should not result in undue complexity across the customer journey for fuel poor households.

Recommendation 1.1. Use cross-sector and cross-department data for more efficient targeting of fuel poor households and to learn from existing programmes.

⁶ Department of Energy Security and Net Zero (2024) *Annual fuel poverty statistics report 2024 (2022 and 2023 data)*. Available at: www.gov.uk/government/statistics/annual-fuel-poverty-statistics-report-2024

⁷ Research Institute for Disabled Consumers (2022) *Call to Action: Renewable Home Energy and Heating solutions*. Available at: www.ridc.org.uk/content/research-and-consultancy/our-insights/sustainable-energy/creating-sustainable-inclusive

Recommendation 1.2. Recognise the role of local authorities and provide the necessary support for targeting fuel poor households and ensure participation across schemes.

Recommendation 2. Provide end-to-end advice and support, which consider the associated costs of participating in energy efficiency schemes.

Recommendation 3. Targeted and specific action for the private rented sector.

Recommendation 4. Harness and empower trusted intermediaries and independent advice providers to support clarity around information.

Recommendation 5. Enhanced monitoring and evaluation to better understand progress towards reducing fuel poverty as part of scheme delivery and better understand take-up and dropouts across the customer journey.

Introduction and methodology overview

This study was commissioned by the Department for Energy Security and Net Zero (DESNZ) on behalf of the Committee on Fuel Poverty to explore the barriers and enablers to ensuring fuel poor households can make a fair and equitable transition to net zero, and the role of government energy efficiency schemes in achieving this.

Challenges in transitioning to net zero are currently prevalent across all households in England. While the findings of this report may have broader applicability, the research specifically focuses on fuel poor households and energy efficiency schemes targeting the fuel poor.

Fuel poverty and the net zero transition

Wholesale energy price increases in the last two years have resulted in average bills nearly three times higher than at any point since the 1970s,⁸ leading to unprecedented government intervention in the energy market. These increases have also led to instability in the energy retail market with around 30 household energy suppliers going out of business. From 2022 to 2023, there was a 20% increase in the average fuel poverty gap, which indicates the reduction in fuel costs required to move a household out of fuel poverty.⁹ The impact of financial support like the Warm Home Discount and fuel vouchers has been to offer immediate short-term relief to households that are finding it hard to afford their fuel bills. Wholesale energy price turbulence has currently subsided and bills are falling. However, the effects of recent price increases have left an impact¹⁰ and there may be repeat periods of crisis in the future.

Significant change is urgently needed in relation to domestic energy consumption if the UK is to meet its legally binding target to cut carbon emissions to net zero by 2050. Reducing greenhouse gas emissions from UK buildings via energy efficiency improvements and decarbonising heat is a key element in the transition to net zero.¹¹ 17% of UK carbon emissions

⁸ Carbon Brief (2022) *Analysis: Why UK energy bills are soaring to record highs*. Available at:

www.carbonbrief.org/analysis-why-uk-energy-bills-are-soaring-to-record-highs-and-how-to-cut-them/

⁹ The percentage of households in fuel poverty has remained relatively unchanged from 2022 (13.1%) to 2023 (13.0%). The average fuel poverty gap is the £ reduction required to a fuel poor household's fuel bill to move it out of fuel poverty. In 2023 this was £417, 20% higher than 2022 in real terms and the highest level recorded since these figures started in 2010. Department of Energy Security and Net Zero (2024) *Annual fuel poverty statistics report 2024 (2022 and 2023 data)*. Available at: <https://www.gov.uk/government/statistics/annual-fuel-poverty-statistics-report-2024>

¹⁰ Citizens Advice offered debt advice to the highest number of people in January 2024 and debt levels are increasing. Citizens Advice (2024) *Citizens Advice Cost of Living dashboard March 2024*. Available at: <https://public.flourish.studio/story/1634399/>

¹¹ HM Government (2021) *Net Zero Strategy: Build Back Greener*. pp. 22-23. Available at:

<https://assets.publishing.service.gov.uk/media/6194dfa4d3bf7f0555071b1b/net-zero-strategy-beis.pdf>

originate from the domestic housing stock.¹² Decarbonising UK homes presents particular challenges: the housing stock is older and less energy efficient than that in similar nations; 90% of domestic heating uses fossil fuels; and there have been low insulation rates since 2013.¹³ On fuel poverty, progress has been made to increase the number of low-income households living in Fuel Poverty Energy Efficiency Rating (FPEER) band properties rated A-C (a 39% increase since 2010 to 54% in 2023). Yet, 46% of low-income households live in FPEER band properties rated D-G.

Reaching net zero and tackling fuel poverty are two intertwined issues. Energy efficiency is a central pillar of the government's net zero strategy as well as defining the key fuel poverty milestone for 2025, which focuses on improving homes to at least a FPEER Band D. Without addressing fuel poverty, overall net zero efforts will be undermined as carbon emissions cannot be eliminated without improving all homes. As fuel poor households are disproportionately affected by the rising costs of energy, it is vital that the transition to net zero does not increase the living costs of those most at risk. This challenging, multidimensional issue of supporting fuel poor households to transition to net zero overlaps with the broader 'energy trilemma' of sustainability, security and affordability.

Despite the energy crisis, some positive progress on energy efficiency and fuel poverty has continued in recent years, with government funded measures estimated to have lifted 112,000 households out of fuel poverty between 2022 and 2023, and government support for bill payers estimated to have prevented a further 350,000 households from experiencing fuel poverty in 2022.¹⁴ However, this progress falls far short of what is needed to meet the 2030 fuel poverty target and net zero goals. As made clear in the Committee on Fuel Poverty's 2023 annual report,¹⁵ there is a high risk that the 2025 fuel poverty milestone will be missed.

This research focuses on two of the five main recommendations set out by the Committee in that report: Ensuring a fair transition to net zero that does not increase fuel poverty and improving the targeting of energy efficiency schemes to meet the government's goals and milestones. This study aims to support progress on these two actions through answering the following research questions:

- How do different stakeholders supporting fuel poor households expect these households to transition to net zero?
- What is the customer journey for fuel poor households to take up government energy efficiency programmes and what are the barriers and enablers to this?

¹² Department for Energy Security and Net Zero (2023) *2022 UK greenhouse gas emissions, provisional figures* p 13. Available at:

https://assets.publishing.service.gov.uk/media/6424b8b83d885d000fdade9b/2022_Provisional_emissions_statistics_report.pdf

¹³ Skidmore, C (2022) *Mission Zero. Independent Review of Net Zero*. Pp. 242-243. Available at:

<https://assets.publishing.service.gov.uk/media/63c0299ee90e0771c128965b/mission-zero-independent-review.pdf>

¹⁴ Committee on Fuel Poverty (2023) *Meeting or Missing the Milestones - Annual Report 2023*. Available at

<https://assets.publishing.service.gov.uk/media/64943704831311000c296187/cfp-annual-report-2023.pdf>

¹⁵ Ibid

Full details of the research questions and sub questions can be found in the Technical Annex.

The energy efficiency schemes explored in this study were the Energy Company Obligation (ECO4), the Home Upgrade Grant (HUG), the Green Homes Grant Local Authority Delivery scheme (LAD) and the Social Housing Decarbonisation Fund (SHDF), all of which aim to target fuel poor households.¹⁶

Fuel poverty measurement and interdependencies

Fuel poverty in England is measured using the Low Income Low Energy Efficiency (LILEE) metric, which focuses on the interdependency between the energy efficiency of the home and the affordability of energy required to heat it, based on energy prices and household income. A household is considered to be fuel poor if:

- It is living in a property with a FPEER of Band D, E, F or G.
- Its disposable income (income after housing costs and energy costs) would be below the poverty line.¹⁷

As such, no household is defined as fuel poor in England if it lives in a property with FPEER of Band A-C, irrespective of household income. Nearly 30% of non-fuel poor households that live in a FPEER Band A-C property are on a low income, with a median income of £27,200 that is nearly 15% lower than households with the highest income in Band E. Thus, there may be non-fuel poor households in FPEER Band A-C properties that cannot afford to heat their home, or face 'heat or eat' choices. Overall, in 2023, most fuel poor households lived in FPEER Band D properties (81%), 13% in Band E homes and 6% of households in Band F-G homes.¹⁸ A high proportion of fuel poor households in Band D properties could be lifted out of fuel poverty via a single SAP band increase.

The complexity and interconnectedness of fuel poverty is explored throughout the study as we consider the different factors that may be hindering or supporting the net zero transition, distinctions and variations across different household and personal characteristics, and the roles of different actors in supporting fuel poor households.

Overview of the methodology

The evidence underpinning this research was collected via a review of existing literature and through interviews and workshops with stakeholders that work with households in fuel poverty

¹⁶ Other schemes, like the Boiler Upgrade Scheme, which does not directly target fuel poor households, were omitted from this study, but some of the barriers and enablers may be applicable to these too.

¹⁷ The poverty line (income poverty) is defined as an equivalised disposable income of less than 60% of the national median in Section 2 of the ONS publication *Persistent poverty in the UK and EU: 2017*. Department of Energy Security and Net Zero (2024) *Annual fuel poverty statistics report 2024 (2022 and 2023 data)*. Available at: www.gov.uk/government/statistics/annual-fuel-poverty-statistics-report-2024

¹⁸ Ibid

and with fuel poor households themselves. A detailed overview of the research methodology and limitations is provided in the Technical Annex accompanying this report.

Literature review

A literature review was conducted to collect and assess existing evidence, to begin to answer the research questions, and to identify any specific knowledge gaps. The literature review involved searching for grey literature (information produced outside of commercial and academic publishing and distribution channels) and academic literature using relevant key words. Literature was categorised based on its contribution to answering the research questions, and its relevance in terms of the schemes covered, the tenure focus, and any personal and household characteristics explored.

Interviews and workshops

A select group of stakeholders that work with fuel poor households were engaged to gather insight into the approaches, barriers and opportunities enabling their transition towards net zero and to fill evidence gaps from the literature review. We conducted 37 one-hour interviews with a variety of stakeholders, including energy company representatives, local authorities, social housing representatives, those working in the private rented sector, independent advice organisations, delivery organisations including retrofit co-ordinators and installers, and several academics focused on fuel poverty and energy efficiency retrofit. Interviews were also conducted with fuel poor households that have accessed energy efficiency schemes. Following the interviews, a series of six themed, deliberative workshops were held to delve deeper into the different stages of the customer journey. One workshop was held with fuel poor households.

Limitations of the research

As a research study, this report does not aim to provide an overall assessment of the effectiveness of energy efficiency schemes and their impact on fuel poverty as these are covered by their individual independent evaluations. Rather, it aims to provide an overview of the common barriers, as well as the enablers and mechanisms which will support fuel poor households to transition towards net zero fairly and equitably. The research has some limitations:

Review of the literature: The literature review identified papers fitting the search criteria. Not all of these were reviewed in depth due to time available to deliver the study. A shortlisted number of the most appropriate papers were selected for in-depth review.

The definitions around fuel poverty, and the connectedness of fuel poverty with other vulnerabilities and issues, presented a challenge in terms of disentangling which issues are specific to fuel poverty and what can be done specifically to address them. Reviewed papers and reports often do not make this distinction clear either.

Limited representation of views from fuel poor households: The core of the study focused on those working with and delivering programmes to support fuel poor households. We

successfully engaged with six fuel poor households. All households had or were receiving support from one geographically specific scheme.

Timing for research delivery: Due to the short timeframe available for the research, many interviews and workshops were conducted during the same period. This limited the ability to delve into themes and have deeper exploration of emerging topics from the interviews during the workshops. However, the researchers involved in the interview process were involved in the workshops, which helped to bring those learnings and insights into the discussions.

Access to unpublished evaluations: It was not possible to access evaluation reports which were in draft stages. The research could not then draw on the most up-to-date evaluation evidence of most recent schemes.

The structure and content of this report

The rest of this report is structured as follows:

Section 3 explores stakeholder expectations of how fuel poor households will transition to net zero, including the barriers and enabling factors, and the distinctions and variations across different household and personal characteristics.

Section 4 looks in detail at the customer journey for fuel poor households accessing government energy efficiency schemes. (Annex 3 sets out the customer journeys in more detail including for different tenures.)

Section 5 discusses the role of Government and other actors to support attainment of the 2030 fuel poverty target.

Section 6 leads on to conclusions, policy implications and recommendations.

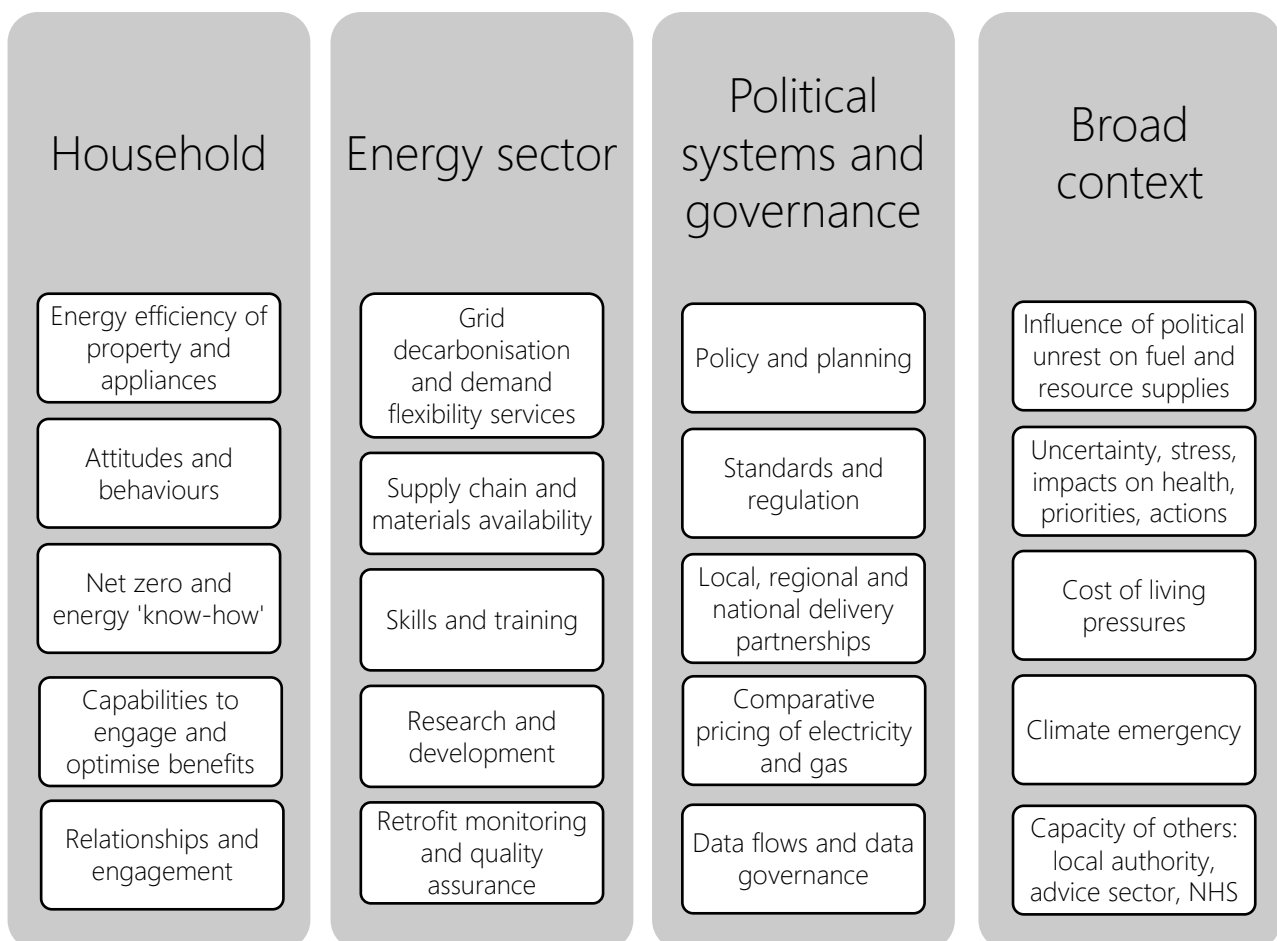
Net zero transition of fuel poor households

This chapter explores the broad question of how different stakeholders supporting fuel poor households expect those households to transition to net zero. Through our review of existing evidence, interviews and workshops, we have explored in depth the barriers to progressing this transition, the enabling factors that could support it, and how these vary across different household and personal characteristics.

Expectations of how fuel poor households will transition to net zero

Evidence from the research found that energy efficiency and decarbonisation sit within a range of interlinking factors that influence fuel poverty and achieving net zero in different ways (Figure 1).

Figure 1: Fuel poverty interdependencies



Fuel poverty often intersects with and exacerbates, or is exacerbated by, other societal challenges, such as general poverty, health inequalities, and educational disadvantages.¹⁹ Fuel poverty is also influenced by a range of factors, including geographical differences, rural and urban variations driven by the housing stock²⁰ and the availability of energy support services. Addressing fuel poverty also brings to the forefront broader societal issues related to fairness, equity and the distribution of resources.²¹

Fuel poor households will require both the installation of energy efficiency and retrofit measures, as well as the adoption of low carbon technologies, to achieve net zero. The stakeholders involved in the research emphasised that a removal of upfront and hidden costs, particularly for low carbon technologies (like upgrading an electricity connection), along with better targeted schemes for fuel poor households will be necessary but not sufficient for this transition.

Interviewees and workshop participants highlighted issues and opportunities beyond costs. The barriers and enabling factors identified in the research can be summarised into eight key themes (see Table 1). The next sections describe the barriers and enablers drawn from the literature review, interviews and workshops.

¹⁹ London Economics (2023) *Understanding the challenges faced by fuel poor households. Final report for the Committee on Fuel Poverty*. Available at: <https://londoneconomics.co.uk/blog/publication/understanding-the-challenges-faced-by-fuel-poor-households-may-2023/>

²⁰ Department of Energy Security and Net Zero (2024) *Annual fuel poverty statistics report 2024 (2022 and 2023 data)*. Available at: <https://www.gov.uk/government/statistics/annual-fuel-poverty-statistics-report-2024>

²¹ De Mel *et al.* (2023). *A decision-support framework for residential heating decarbonisation policymaking*. Energy, 268. <https://doi.org/10.1016/j.energy.2023.126651>

Table 1: Themes that influence fuel poor households' transition to net zero, with high level barriers and enabling factors

Theme	Description of theme	Barriers	Enabling factors
Financial	Related to costs, funding, and financial mechanisms.	Costs not covered by grant support. Potential higher running costs. Associated costs with installations (preparation/remedial).	Increase grant funding. Expand financial options. Wider support options.
Knowledge, information and communication	Knowledge and information on energy use and measures. Communications between households, in communities, with advisors, the retrofit supply chain and wider actors.	Low public understanding of net zero and its implications for them. No public information campaign on net zero. Fragmented energy advice service in England. Misinformation and uncertainty on where to obtain trustworthy information. Negative word of mouth. Complex scheme landscape confusing. Lack of understanding of retrofit options, benefits and use.	Public information campaign via media channels and local venues. Trusted intermediaries for advice. Easily accessible, locally tailored advice. Positive word of mouth. A single point of contact throughout the process. Post-installation support on implications of retrofit and to optimise use of technologies. Information on consumer protections.
Regulation and policy	Scheme design, supportive policies or regulations, e.g. Minimum Energy Efficiency Standards (MEES).	Competitive tendering and insufficient funding for schemes restrict availability of support. Scheme design and commercial attractiveness omits households in need. Single measure schemes do not achieve retrofit required. Gap between FPEER Band C and achieving net zero. EPC scoring design does not incentivise electric heating.	Simplify redress for private tenants' retaliatory evictions. The importance of MEES. Simplified landscape of schemes. Use of PAS 2030/2035. Local area-based scheme delivery.
Buildings	Specific issues arising from property construction, adaptation (e.g. by tenants) and condition	Need for pre-installation or remedial works. Disruption to the household. Schemes target individuals not buildings, e.g. flats.	Cover all costs of retrofit process (remedial and hidden costs). Specific guidance on retrofit for traditional buildings.

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	(e.g. repairs, damp and mould).	Planning permissions, listed buildings.	Support for whole building retrofit for flats.
Operations	The activities involved in the delivery of energy efficiency schemes including assessment and installation.	Regional imbalances in local authority capacity to deliver grant support. Lack of local authority resources. Complicated scheme governance, administrative costs and bureaucracy. Lack of post-installation support for households.	Simplify scheme governance and administration. Area-based retrofit delivery model for economics of scale, local tailored approach and supply chain development. Systems approach to area-based delivery engaging multiple actors.
Commercial and supply chain	Availability of installers, other supply chain and materials. Skills and training. Factors related to wider energy sector businesses, e.g. Distribution Network Operators and grid connections.	Lack of long-term policy certainty and consistency on net zero, retrofit and schemes limits supply chain development. Insufficient numbers of qualified installers and retrofit professionals. Lack of skills strategy for retrofit. Schemes fail to account for inflationary pressures which affects economic viability of installations.	Increase numbers of qualified installers and retrofit professionals. Long-term skills strategy and local skills initiatives. Local authority delivery frameworks to aid procurement, design, economic viability.
Attitudes and Behaviours	Motivation and attitude affecting decisions and behaviour of households.	Negative press and misinformation. Household lack of trust in retrofit supply chain and energy system.	Positive, relevant messaging from government and advice services. Positive word of mouth via social networks. Ensure quality standard for installations are met. Engage via trusted intermediaries, e.g. faith groups.
Personal and household	Related to the material circumstances and characteristics of people and households.	Risk-aversion. Time-poverty. Stress, reduced cognitive bandwidth to engage.	Personalised approach. Ongoing support.

Key barriers and enabling factors identified

Financial

Financial barriers: Cost presents a challenge for fuel poor households, which are likely to have low or no savings, may have higher levels of debt and have limited spending power to address maintenance and other property related issues.²² Interviewees considered the costs to adapt a household to net zero to be too expensive, even with grant support through energy efficiency schemes. Hidden or any associated costs are not included within grant support, making it at times harder to undergo energy efficiency improvements. For example, costs to clear a loft before insulating, remedial works, switching to an electric cooker when gas is removed, or consideration of on-going running costs of heat pumps. Evidence suggests that switching to low carbon or electric heating systems will drastically lower a household's carbon emissions, yet it will do little to impact bill affordability while the cost of electricity remains higher than gas.²³

Financial enablers: Financial enablers should be geared to (1) provide greater access to funds; (2) expand the financing mechanisms that are available to fuel poor households in all tenure types; and (3) address costs of electricity versus gas.

The literature and stakeholders' perspectives indicate that above all, increasing the amount of grant funding was considered a crucial enabler for fuel poor households given their inability to pay. It was mentioned that noting impacts beyond carbon and cost savings, such as health and well-being impacts related to energy efficiency, will improve the case for increasing funding from across government departments and for resource sharing across local service providers.²⁴

Stakeholders mentioned that flexible financing mechanisms could expand the options available. This could include the Scottish Government's approach of offering interest free loans for retrofit,²⁵ or alternative loan structures (attaching the loan to the property not the person), offering a stamp duty rebate to retrofit, VAT reduction on retrofit, and tax incentives for private landlords to incentivise retrofit.

Evidence suggested that reducing long-term household running costs by addressing the cost of electricity is key to increasing uptake of energy efficiency measures, although interviewees noted that this must be done in a way that does not negatively impact those still using gas or to the detriment of the building fabric. This does generate a dichotomy of needing to protect low-income and fuel poor households against the unaffordability of energy prices in the immediate

²² Middlemiss, L. *et al.* (2023) Conceptualising socially inclusive environmental policy: A just transition to net zero, *Social Policy and Society*, 22(4), pp. 763–783. doi:10.1017/s1474746423000180.

²³ Electricity costs almost four times more than gas under the current price cap - Bolton, P. (2024) *Gas and electricity prices during the 'energy crisis' and beyond*, House of Commons Library. Available at: <https://commonslibrary.parliament.uk/research-briefings/cbp-9714>.

²⁴ Jones, A (2022) *Person-Centred Retrofit: A fuel poverty vulnerability led approach*. Carbon Co-op. Available at: <https://cc-site-media.s3.amazonaws.com/uploads/2022/01/Person-Centred-Retrofit-Full-report.pdf>

²⁵ Scottish Government (2024) *Grants and loans for energy saving improvements*. Accessed at: <https://www.mygov.scot/energy-saving-grants>

term and the need to provide longer-term support for fuel poor households to achieve net zero. Interviewees highlighted the potential to introduce a social tariff²⁶ or similar mechanism which could be used to limit the price of electricity for those fuel poor households who do switch to electric heating systems.

Knowledge, information and communication

Knowledge, information and communication barriers: The literature review found there was public support for environmental policies if they were seen to address immediate problems and were perceived to be fair.²⁷ These judgements require some level of public awareness and understanding. Interviewees commented that the public tend to perceive net zero as a distant goal. There is no clear picture of what the transition will mean on a day-to-day level for households, what changes it will necessitate for them, nor what benefits it could entail. It was also felt that there was no public central information campaign on net zero, nor provision of energy advice and support across the country, and that this has ultimately led to a fragmented and disjointed information and advice environment. As a result, people do not know where to turn for impartial, trusted advice or to access information containing the details of available energy efficiency schemes and support. Interview and workshops participants reported that the energy efficiency scheme marketplace is complex, overcrowded and ever-changing, and they perceived that this could make it difficult for fuel poor households to understand what support is available to them. Advice services were reported to be at capacity with long waiting lists and requiring greater resource to sustain advice provision. Availability of energy advice services is not consistent across England, meaning that there is skewed access to advice and support around retrofit and low carbon technologies.

Interview and workshop participants highlighted that in their experience fuel poor households could find the transition to net zero daunting or overwhelming due to a lack of understanding of energy efficiency measures and new technologies like Air Source Heat Pumps (ASHPs) and how they work, or the need for ventilation following the installation of insulation. Interviewees stressed that if fuel poor households do not know how to use new electric heating systems (heat pumps, high performance storage heaters) or how to adapt behaviours following the installation of measures, it could lead to worsening fuel poverty and increased carbon emissions. For example, they could end up increasing their bills, or not using their new system. This was perceived to have the potential to lead to negative householder experiences which spread within a community. Stakeholders considered 'word of mouth' to be the most powerful tool to achieving net zero.

Knowledge, information and communication enablers: Advice on net zero needs to be easily accessible, not require significant time to find, and originate from a source that the public trusts. Fuel poor households need to have a clear understanding of what technology is available

²⁶ National Energy Action (NEA) (2022) *Solving the cost-of-living crisis: The case for a new social tariff in the energy market*. Available at: https://www.nea.org.uk/wp-content/uploads/2022/07/2022_Solving-the-cost-of-living-crisis_v02.pdf

²⁷ Poortinga, W. *et al.* (2023) Factors and framing effects in support for net zero policies in the United Kingdom, *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1287188>

to them and how it could impact their homes. Evidence from the literature review, workshops and interviews identified that fuel poor households need information on energy-related behaviours, energy efficiency and low carbon technologies tailored to their home, region and circumstances from trusted intermediaries like independent advice services. Support offered should encompass advice and information on how to use any new system installed and information on where to turn to if something goes wrong. All evidence sources highlighted that greater knowledge and awareness of net zero could be achieved through widespread promotion in places where people interact with it in their daily lives, like local radio, TV, outreach at trusted community service providers, health services, schools or children's centres. Similarly, in-person 'one-stop shops' where people can obtain advice, an energy audit, finance, installation and oversight to support the customer journey can aid the transition to net zero.²⁸

Regulation and Policy

Regulation and Policy barriers: Retrofit-related policy and scheme design was consistently discussed as a barrier to fuel poor households transitioning to net zero. Evidence from the literature review, interviews and workshops found that scheme procurement and design was suboptimal to support those in fuel poverty. Several factors were reported to contribute to this, including insufficient funding and competitive tendering,²⁹ which results in not everyone experiencing fuel poverty being supported. Some energy efficiency scheme requirements were also felt to prevent some types of homes from being considered. For example, remedial works may be required to address underlying building issues, the cost of which may not be fully covered under schemes, reducing the commercial attractiveness of the retrofit to installers. Furthermore, it was perceived that delivery bodies deprioritise properties that require substantial changes which do not result in significant EPC changes but would have some benefit to the household. Participants were of the view that this creates a situation where delivery bodies are very selective on which properties to treat, rather than focusing on addressing fuel poverty, so there is a risk that those with the hardest to treat or less commercially attractive properties are left behind.

For single measure schemes, there is the risk of overlooking multiple energy efficiency requirements of the property, which could exacerbate existing issues and require that properties be revisited again to help them reach net zero. For instance, the NEST scheme in Wales resulted in high numbers of boiler upgrades without installing loft insulation. It was found that the scheme had drifted from its original purpose of tackling fuel poverty into being 'increasingly focused on replacing broken or inefficient boilers for people on means tested benefits'.³⁰ The

²⁸ Chartered Institute of Housing Cymru (2022) *Decarbonising Wales' private rented sector: Tackling the energy crisis to meet net zero*. Available at: <https://cih.org/media/zbccclbu/0510-ttc-decarbonising-wales-private-rented-sector-v5.pdf>

²⁹ Bridgen, P. and Robinson, C. (2023) 'A decade of fuel poverty in England: A spatio-temporal analysis of needs-based targeting of domestic energy efficiency obligations', *Energy Research and Social Science*, 101, p. 103139. <https://doi:10.1016/j.erss.2023.103139>.

³⁰ Equality and Social Justice Committee (2022) *Fuel poverty and the Warm Homes Programme*. Welsh Parliament. Available at: <https://senedd.wales/media/occhlkio/cr-ld15117-e.pdf>

rationale in designing ECO4 to focus on whole house retrofit was intended to counter this problem encountered with single measure schemes.

Government policy aims to ensure that as many households as reasonably practicable achieve a minimum FPEER of Band C by 2030.³¹ As a proxy for this, most support provided under current schemes aims to bring homes to EPC Band C where possible. This is different to a home being considered as net zero with further work required to reduce its carbon emissions. This creates a gap in support for fuel poor households to move from a moderate level of energy efficiency to net zero.

EPCs were seen as limited in their ability to measure whether the homes of fuel poor households have achieved net zero, as the methodology through which EPC ratings are calculated relates to cost performance rather than carbon emissions, and in its current scoring design, it is not geared towards incentivising electric heating.³² This again re-emphasises that as long as electricity prices remain higher than gas prices, policy based on EPC ratings will not incentivise net zero.

Regulation and Policy enablers: Findings from the literature review, interviews and workshops highlight that policy and regulation in the private rental sector could have significant impact on attaining the 2030 poverty target and aiding fuel poor households to transition to net zero. Firstly, government simplification of tenant processes to challenge retaliatory eviction, coupled with education on tenant rights, could increase tenant confidence to ask their landlord to make energy efficiency improvements or seek permission to do so themselves. The current retaliatory eviction appeal process is complicated, requiring a tenant to have requested major works before an eviction and the involvement of an environmental health officer.

Second, interview and workshop participants suggested that clarifying Minimum Energy Efficiency Standards (MEES) – for instance, specifying private rental properties to attain EPC Band C by 2030 – could set the trajectory for landlords on property improvement requirements. MEES place a legal duty on homeowners to ensure that their property meets a minimum energy efficiency rating. Private landlords are required to spend up to £3,500 to ensure this is attained, although there are exemptions. Interviewees suggested that the MEES exemptions and cost cap³³ should be revisited, and that the government should leverage private investment from

³¹ Department of Energy & Climate Change (2014) *Fuel poverty (England) regulations 2014 and methodology*. Available at: www.gov.uk/government/publications/fuel-poverty-england-regulations-2014-and-methodology.

³² This is informed by research with independent advice organisations. Currently, switching from a gas boiler to an ASHP has the potential to have a small impact on EPC rating. There will be instances where switching from a gas boiler to an ASHP can improve the EPC rating, although that depends if the ASHP is more efficient than the gas boiler and the building's insulation and energy efficiency measures are optimized. More detail on the challenges related to the EPC metrics can be found at: Climate Change Committee (CCC) (2023) *Annex reform of domestic EPC rating metrics to support delivery of net zero*. Available at: www.theccc.org.uk/wp-content/uploads/2023/02/Annex-Reform-of-domestic-EPC-rating-metrics-to-support-delivery-of-Net-Zero.pdf

³³ The cost cap is £3,500 (including VAT), above which a private landlord is not required to spend on energy efficiency improvements. There are five exemptions (e.g. wall insulation exemption) which a landlord can register a property for in certain instances. <https://www.gov.uk/guidance/domestic-private-rented-property-minimum-energy-efficiency-standard-landlord-guidance>

landlords such as via tax allowances.³⁴ It was also suggested that funding appropriate to the task was also needed for local authorities to monitor and enforce MEEs, with closer working between central and local government to do so.

Workshop participants reported that a simplified landscape of schemes with clear, streamlined retrofit processes building on the foundations of PAS 2030 and PAS 2035 would make it less complicated for fuel poor households to engage in schemes and as a result build their confidence and ability to engage. It was suggested that government support for more area-based local scheme delivery could allow solutions to be adapted to local property or household circumstances. A local or regionally tailored approach to delivery could also reflect and develop local supply chain capacity and skills.

Buildings

The barriers and enablers described for buildings apply to any household in England.

Buildings barriers: Interview participants explained that several factors relating to the building or property itself can create barriers for fuel poor households in the transition to net zero. Firstly, a property may need pre-installation works (e.g. loft clearance), remedial measures or structural improvements before energy efficiency improvements can be made or low carbon technologies installed. Both larger and smaller pre-installation works can lead to disruption, with additional costs to the householder becoming a deterrent to participation for fuel poor households.

Secondly, participants reported that some properties are too small for certain technologies (e.g. flats with no outdoor or indoor space for a heat pump). It is also more difficult to install certain technologies, like solar panels or ASHPs, in flats and apartments. For example, wall insulation is more difficult or cannot be undertaken for one flat, it must be carried out for the whole building. This requires buy-in from other residents, which may be difficult to attain given that current government support targets individuals rather than whole buildings. Finally, there may be additional processes involved, such as applying for planning permissions or bespoke retrofit installations. For example, older or listed buildings are more likely to need additional work before a heat pump can be installed and may face restrictions in what measures can be installed due to conservation planning policies.

Buildings enablers: Interview and workshop participants suggested that specific guidance is needed for households living in older properties or listed buildings that explains the most appropriate measures and/or new technologies for their home in order to achieve net zero. Additionally, for flats, shifting to an approach where the whole building can qualify for

³⁴ National Energy Action (NEA) (2024) *UK Fuel Poverty Monitor 2022-23*. Available at: <https://www.nea.org.uk/publications/uk-fuel-poverty-monitor-national-energy-action-2022-23/>

government support could allow more private rental and owner occupier households to participate in the net zero transition.

Operations

Operations barriers: According to the literature review, interviews and workshops, the way in which schemes are delivered can create a barrier to fuel poor households' participation. This includes regional imbalances in local authority capacity to deliver grant support and target fuel poor households (e.g. for LAD, HUG, ECO Flex, and SHDF). Local authorities need to have the resources to focus on identifying homes to treat and to refer these to installers and to submit bids for funding, which takes time and resources.³⁵ Both fuel poor households and delivery bodies consistently viewed scheme governance, administrative costs and bureaucracy as complicated and difficult to navigate. It was considered that this prevents households from engaging with schemes offering energy efficiency or low carbon technologies.

Interview and workshops participants reported that a lack of follow-up support for households to ensure installation and measures are working effectively and households have adapted to the new measures can lead to suboptimal situations and potentially worsening fuel poverty cases, such as higher fuel bills.

Operations enablers: Interview and workshop participants suggested that simplifying scheme governance and administration could make it easier for households to apply and give sufficient funding and time for local authorities and social housing providers to deliver schemes. Interviewees also discussed the benefits of shifting to a community retrofit delivery model across a geographical area (although not necessarily street by street). This could enable materials to be bought in bulk, creating economies of scale, and supporting local jobs in the retrofit supply chain. It was felt that this approach could support the dissemination of positive experiences as area-based schemes allow for positive messages to permeate through the community. One interviewee emphasised the need to take a systems approach to area-based delivery. This would require engaging multiple actors within a local area to ensure availability of financial support across tenure types.

Commercial and supply chain

Commercial and supply chain barriers: In workshops, participants reported that a lack of long-term policy certainty and consistency on net zero, retrofit and accompanying schemes created commercial and supply chain barriers. Perceived uncertainty and inconsistency were thought to limit the development of the broader supply chain for energy efficiency and low carbon technologies. Without that long-term view, participants reported that manufacturers and installers were likely to have less incentive to invest in innovation, materials and labour, leading to a reduced number of installers able to carry out works. This led to delays in retrofit delivery, which could result in scheme dropout. The perceived lack of a strategy for skills for retrofit to

³⁵ Local authorities have to bid to receive funding under the Local Authority Delivery (LAD) scheme and the Home Upgrade Grant (HUG).

either retrain workers or attract young people into the industry was identified as also contributing to this situation. Participants also held the view that, so far, scheme design has failed to account for inflationary pressures for installers (i.e. not increasing the funding available in line with inflationary costs of materials or labour). As a result, some measures are no longer economically viable for installers to deliver under certain schemes which have a cost cap.

Commercial and supply chain enablers: According to the literature review, interviews and workshops, efforts to grow the supply chain, increase the number of installers, retrofit assessors and co-ordinators, and the supply of materials would generate efficiencies both in cost and timescales which could benefit fuel poor households. Delays in the retrofit process due to lack of supply chain or materials could lead to fuel poor households dropping out of schemes, potentially deterring their future engagement. Local authority delivery frameworks for contractors (e.g. Norwich City Council Fabric First Framework) can aid procurement, design and construction, thus improving economic viability in social housing.³⁶ In interviews, a long-term skills strategy, as well as local skills initiatives, were suggested as ways to develop the labour force within a given area to support delivery of net zero.

Attitudes and behaviours

Attitudes and behaviours barriers: Interview and workshop participants reported that negative press and misinformation creates attitudinal barriers as it makes households sceptical of net zero or certain technologies. Other attitudinal barriers raised included a lack of trust in actors within the retrofit supply chain and energy system, particularly installation companies. The literature highlighted that previous knowledge or experiences of forced fitting of pre-payment meters can contribute to these barriers as households may have a negative view or lack trust in their energy supplier, or the energy system.³⁷

Attitudes and behaviours enablers: Public messaging via the government, advice services and the supply chain needs to be positive to combat negative press and misinformation and address attitudinal barriers towards net zero. Messaging also needs to be relevant and understandable to fuel poor households. For example, any cost savings should be explained in concrete monetary terms rather than percentages. One paper suggested that positive word of mouth through social networks of family and friends was a clear enabler of net zero and was relied upon to find trustworthy installers.³⁸ The evidence reviewed also suggests information through these social connections is significantly more likely to motivate a household to install retrofit measures in comparison to expert advice.³⁹

³⁶ Zhao, J. (2023) Implementing net zero affordable housing - towards a human-centred approach, *Journal of the British Academy*, 11(s4), pp. 9–34. <https://doi.org/10.5871/jba/011s4.009>

³⁷ Atkins, E. (2023) '6: Home', in *A just energy transition: Getting decarbonisation right in a time of crisis*. Bristol: Bristol University Press.

³⁸ Middlemiss, L. *et al.* (2023) Conceptualising socially inclusive environmental policy: A just transition to net zero, *Social Policy and Society*, 22(4), pp. 763–783. <https://doi.org/10.1017/S1474746423000180>.

³⁹ Bolton, E. *et al.* (2023) The relational dimensions of renovation: Implications for retrofit policy, *Energy Research and Social Science*, 96, p. 102916. <https://doi.org/10.1016/j.erss.2022.102916>

Two approaches to facilitate positive word of mouth relating to energy efficiency schemes and net zero in general were suggested. First, workshop participants noted that ensuring that installation quality standards were achieved (for example via physical inspections), would result in any installation issues being picked up and more households having a positive experience. The literature review and interviews highlighted that a second means to promote net zero was through trusted intermediaries, such as well-known community organisations or faith leaders, and to showcase local case studies. The trusted intermediaries route is important for fuel poor households. Evidence from the literature review highlighted that they have often experienced broken promises from government, social inequities, and disenfranchisement from decision making, so are starting their net zero journey from a place of mistrust.⁴⁰

Personal and household

Personal and household barriers: According to the literature review and interviews, personal and household circumstances play a key role in the consideration of energy efficiency and net zero. Factors such as the cost-of-living crisis has meant that considering the long-term benefits of net zero becomes far removed from the requirement of meeting short-term needs. The material circumstances of people in fuel poverty means they may be risk-averse.⁴¹ Interviewees reported that fuel poor households with chaotic lives may suffer from a stress-related reduction in cognitive bandwidth which limits their understanding of what the net zero transition means for them and their household. Lack of time is another factor which was perceived to prevent households from engaging with net zero and energy efficiency. Participants explained that fuel poor households may be working multiple jobs to make ends meet and this limits the time for activities like paperwork or phone calls that could enable access to energy efficiency schemes.

Personal and household enabling factors: Workshop and interview participants suggested that fuel poor households could be engaged via a personalised approach. This could involve having a single point of contact (advisor or retrofit coordinator) to provide ongoing support, or tailored engagement such as outreach or meeting people's communication needs. Advice organisations noted that this approach had helped to reach households that might otherwise not ask for help and to develop trust via ongoing support.

Distinctions and variations across different household and personal characteristics

Age: Approximately 12% of households where the age of the oldest member is 60 or above are fuel poor. Households with the highest proportion of fuel poverty (25%) were those where the age of the oldest member was 16-24 (due to lower incomes). When comparing by age of the

⁴⁰ Tozer, L., MacRae, H. and Smit, E. (2023) Achieving deep-energy retrofits for households in Energy Poverty, *Buildings and Cities*, 4(1). <https://doi.org/10.5334/bc.304>

⁴¹ Anderson, W. White, V. Finney, A. (2010) 'You just have to get by.' Coping with low incomes and cold homes. Available at: <https://www.cse.org.uk/resource/you-just-have-to-get-by/>

youngest occupant, households where the youngest occupant is aged 0-15 had the highest likelihood of being in fuel poverty (around 18%).⁴²

According to literature and interview and workshop participants, older people have different attitudes toward change or are less willing to adopt new technologies or measures. Research participants saw them as more likely to be asset rich (own their own home) but cash poor with limited savings. Older people may require different types of financing mechanisms to engage them in the transition to net zero.

The research also found that older people are more likely to have lower levels of digital literacy or are digitally excluded, creating a barrier to accessing knowledge and information about the net zero transition and the options and technologies available to them. Digital exclusion also affects younger groups (aged 35-44) and low-income households.⁴³

English as a second language: Ethnic minority households are more likely to be in fuel poverty compared to white households (17% compared to 12% respectively).⁴⁴ Interviewees highlighted that there was a lack of information on net zero and energy efficiency in other languages. Many advice agencies use translation services to support households, but this is not common practice amongst installers. This could create a barrier for fuel poor households engaging with different actors, e.g. installers. A workshop participant suggested that diversifying the retrofit supply chain (e.g. gender, ethnicity) could enable better communication with households with English as a second language.

Health and disabilities: The literature review found that those suffering with chronic health conditions or disabilities may have higher energy needs, for example, they may need electricity for medical equipment or require their home to be kept at a higher temperature.⁴⁵ Any disruption to a property was seen to be more challenging and could create further complexities if the level of disruption increased. The consideration of mental health was also highlighted by research participants. A negative feedback loop is created as fuel poverty impacts mental health, which in turn impacts the ability to deal with fuel poverty.⁴⁶ This means that where people are experiencing mental health issues, more support and time may be required to make energy-related changes.

⁴² Department of Energy Security and Net Zero (2024) *Annual fuel poverty statistics report 2024 (2022 and 2023 data)*. Available at: <https://www.gov.uk/government/statistics/annual-fuel-poverty-statistics-report-2024>

⁴³ House of Lords (2023) *Digital exclusion*. House of Lords Communications and Digital Committee. 3rd Report of Session 2022-23. HL Paper 219. Available at: <https://committees.parliament.uk/publications/40662/documents/198365/default/>

⁴⁴ Department of Energy Security and Net Zero (2024) *Annual fuel poverty statistics report 2024 (2022 and 2023 data)*. Available at: <https://www.gov.uk/government/statistics/annual-fuel-poverty-statistics-report-2024>

⁴⁵ UKERC (2018) *Policy pathways to justice in Energy Efficiency*. Available at: <https://ukerc.ac.uk/publications/policy-pathways-to-justice-energy-efficiency/>

⁴⁶ Lawler, C. *et al.* (2023) Homes and Health in the Outer Hebrides: A Social Prescribing framework for addressing fuel poverty and the social determinants of health, *Health and Place*, 79, p. 102926. <https://doi.org/10.1016/j.healthplace.2022.102926>

Rurality: Households in rural areas have a higher rate of fuel poverty compared to semi-urban and urban areas. Properties are less energy efficient and larger than average. 20% of households in off-gas properties (e.g. on oil, LPG gas, electricity or biomass for heating) were fuel poor compared to 12% of households on the gas grid.⁴⁷ Interview participants were of the view that some installers preferred working in urban areas as it involved less travel. They also stated that solutions like heat networks that work in densely populated areas will not translate to rural areas. Those living off-gas may have fewer decarbonisation options. The availability of energy advice services may also be limited.

Tenure - Private Rented Sector (PRS): Throughout interviews and workshops, the PRS was often raised as being particularly difficult to transition to net zero. This housing sector has the highest proportion of fuel poor households of any tenure.⁴⁸ Private tenants are more likely to move house regularly, so improving the energy efficiency of their current property may not support them in the long term. Within the literature, this was also seen as a reason why private tenants may have less incentive to engage with net zero.⁴⁹ Additionally, tenants may fear rent increases if investment is made in the property. Tenants may also fear retaliatory eviction if they report a property not being up to standards, reinforcing the need for stronger tenant protections.

Private sector tenants lack control over what can be installed in their home, including smart meters. An interviewee stated that tenancy agreements commonly used by most landlords were based on a template that has been in circulation for over a decade. This prevented tenants from changing to a smart meter, which may reduce tenants' engagement in the transition to net zero as smart meters are required or can maximise the benefits of low carbon and smart technologies.

The private rental sector is the least energy efficient of all tenure types, making the financial barrier greater to overcome.⁵⁰ The landlord needs to be engaged and willing to invest in net zero and energy efficiency improvements, which interviewees viewed as difficult. There is a 'split incentive' whereby the tenant will reap the benefits of a retrofit or low carbon technology, so the landlord has little motivation to invest.⁵¹

According to the literature, interview and workshop participants, MEES was identified as a policy and regulatory enabler to drive landlords to invest in energy efficiency. In 2020, a government

⁴⁷ Department of Energy Security and Net Zero (2024) *Annual fuel poverty statistics report 2024 (2022 and 2023 data)*. Available at: <https://www.gov.uk/government/statistics/annual-fuel-poverty-statistics-report-2024>

⁴⁸ Department of Energy Security and Net Zero (2024) *Annual fuel poverty statistics report 2024 (2022 and 2023 data)*. Available at: www.gov.uk/government/statistics/annual-fuel-poverty-statistics-report-2024

⁴⁹ Atkins, E. (2023) '6: Home', in *A just energy transition: Getting decarbonisation right in a time of crisis*. Bristol: Bristol University Press.

⁵⁰ Department for Levelling Up, Housing and Communities (2023) *English housing survey 2021 to 2022: Energy*. Available at: <https://www.gov.uk/government/statistics/english-housing-survey-2021-to-2022-energy/english-housing-survey-2021-to-2022-energy>

⁵¹ Chartered Institute of Housing Cymru (2022) *Decarbonising Wales' private rented sector: Tackling the energy crisis to meet net zero*. Available at: <https://cih.org/media/zbccclbu/0510-ttc-decarbonising-wales-private-rented-sector-v5.pdf>

consultation on domestic MEES presented a preferred policy scenario of requiring new tenancies to reach an energy efficiency rating in Band C from 1 April 2025 and all tenancies to reach a C-Band rating by 1 April 2028.⁵² However, in 2023 the government did not change MEES. Standards remain at a lower energy efficiency requirement than consulted on, that properties reach a minimum EPC Band E by 2030. No increase in domestic energy efficiency standards via MEES for private landlords is planned.⁵³ One evidence source suggested that bespoke financial enablers will therefore be needed for this sector, for example, through reintroducing mechanisms like the Landlord Energy Saving Allowance.⁵⁴

MEES also requires enforcement by local authority officers. According to the literature and interview and workshop participants, MEES enforcement is under resourced. For example, recent research found that only 39% of local authorities (from 60 councils surveyed) were actively enforcing MEES. Collaboration and extra resources for enforcement could help to address high fuel poverty in this sector.⁵⁵ A national registration scheme for landlords, as has been implemented in Wales,⁵⁶ would make enforcement easier by allowing local authorities to quickly know who owned a property.

Tenure - Social housing: Interview and workshop participants suggested that households living in social housing will experience distinct barriers and enablers in the transition to net zero. On one hand, there were interviewees of the view that the social housing sector was, on paper, doing better in reaching net zero. Nearly three quarters of social rented homes (73%) are rated FPEER Band A-C. On the other hand, fuel poverty is a significant issue in this tenure due to lower incomes. 56% of tenants in Band D-G rated properties are fuel poor (equivalent to 15% of all social housing tenants).⁵⁷

Interview and workshop participants reported difficulties engaging social housing tenants. For example, it was reported that tenants have limited control or choice over what gets installed in their home. A social housing provider considered that this could lead to tenant disengagement, which subsequently made it difficult for them to access the property to make improvements. Additionally, participants stated that housing provider engagement tends to be top-down and may not fully consider the residents' personal circumstances, how this impacts the way they will

⁵² Department of Business, Energy and Industrial Strategy (2020) *Improving the Energy Performance of Privately Rented Homes in England and Wales*. Available at:

<https://assets.publishing.service.gov.uk/media/5fdcc67fe90e07452fce4e12/prs-consultation-2020.pdf>

⁵³ National Energy Action (NEA) (2024) *UK Fuel Poverty Monitor 2022-23*. Available at:

www.nea.org.uk/publications/uk-fuel-poverty-monitor-national-energy-action-2022-23/

⁵⁴ Chartered Institute of Housing Cymru (2022) *Decarbonising Wales' private rented sector: Tackling the energy crisis to meet net zero*. Available at: <https://cih.org/media/zbccclbu/0510-ttc-decarbonising-wales-private-rented-sector-v5.pdf>

⁵⁵ The Association for Decentralised Energy (2023) *Upskilling for low-carbon heating in the private rented sector*. Available at: <https://www.theade.co.uk/resources/publications/upskilling-for-low-carbon-heating-in-the-private-rented-sector>

⁵⁶ Shelter Cymru (2023) *Landlord registration and licensing*. Available at: <https://sheltercymru.org.uk/housing-advice/finding-a-place-to-live/renting-privately/landlord-registration-and-licensing/>

⁵⁷ Department of Energy Security and Net Zero (2024) *Annual fuel poverty statistics report 2024 (2022 and 2023 data)*. Available at: <https://www.gov.uk/government/statistics/annual-fuel-poverty-statistics-report-2024>

interact with the installation process or the new measures or technologies installed. Both these barriers were perceived to prevent tenant engagement and increase refusal. This highlights the need for social housing providers to have the necessary skills and resources to develop meaningful relationships with vulnerable households to limit refusals to installations, maximising bill reductions and reducing carbon emissions.

However, findings from workshops suggested that social housing providers have a clear plan for how they would reach net zero, access to other budgets that could fill funding gaps, and contracts with installation companies that meant work would get carried out no matter how long household engagement took.

Interview and workshop participants reported that social housing providers could benefit from further advice to understand how to achieve net zero requirements for their housing stock and further opportunities (minimum five-year timelines) to provide new net zero homes for social housing tenants.

Tenure - Owner occupiers: Interviews suggested that previously middle-class owner occupiers struggling with the cost of living may be unable to access grant funding. Extending the scheme's minimum income threshold above £31,000 (e.g. for ECO4 or by local authorities via ECO Flex) could enable financially challenged households to improve their properties to EPC Band C.

Interview and workshop participants explained that many fuel poor owner occupiers are asset rich but cash poor. There was also the perception that older, more vulnerable, mortgage-free homeowners may be reluctant to release equity from their property, as they were concerned about possible future care costs or leaving properties to children. However, participants questioned the use of government funding to renovate high asset properties.

Interview participants were of the view that a different retrofit approach was needed with homeowners compared to tenants. Showing homeowners the benefits of net zero and retrofit was considered essential to spark interest and buy-in. Households could be guided to start on a customer journey with initial small steps, rather than focusing on large measures immediately. Once the homeowner had bought into retrofit and taken the lead, bigger steps could occur with little external effort required.

The role of energy efficiency schemes in tackling fuel poverty

Overview of reviewed energy efficiency schemes

The energy efficiency schemes included in the evidence review for this study were those delivered in England since 2012, with interviews and workshops focusing on current or more recent versions of schemes. The schemes mainly discussed were the Home Upgrade Grant (HUG) scheme, the Green Homes Grant Local Authority Delivery scheme (LAD), and the Social Housing Decarbonisation Fund (SHDF). These are England-only schemes with some designed to reduce the impacts of fuel poverty.

For example, SHDF aims to support social housing landlords to safely improve the energy performance of their properties through the installation of energy efficiency measures and low carbon technologies. A phased approach (demonstrator, waves 1, 2.1, 2.2) taken to enable learning and adaptation to the prevailing political and economic context resulted in different emphases on fuel poverty. The initial SHDF demonstrator did not have the alleviation of fuel poverty as a primary objective. Subsequent SHDF waves (1-2.2) have focused on reducing fuel poverty and carbon emissions.

The Energy Company Obligation (ECO4), a cross-nation whole house retrofit scheme, upgrades the homes of low-income households. All ECO schemes have targeted this household group. The Great British Insulation Scheme (GBIS), a cross-nation single measure top-up to ECO, is not tightly targeted at low-income households so was not discussed in depth.⁵⁸ Other schemes, like the Boiler Upgrade Scheme, which does not directly target fuel poor households, were omitted from this study.

A short summary of the schemes reviewed (measures installed, customer eligibility) is given in Annex 2. This section will describe common barriers and enablers present across the customer journey through the different reviewed energy efficiency schemes, factors that will enable greater uptake, and a review of energy efficiency schemes to identify whether they achieved the intended outcomes for fuel poor households.

Customer Journey

Following the literature review, a standardised customer journey was created for energy efficiency schemes. This mapped out the different stages involved in the end-to-end process of energy efficiency scheme delivery from pre-engagement to post-installation (Figure 2). Although the customer journey is presented linearly, the customer journey is unlikely to be

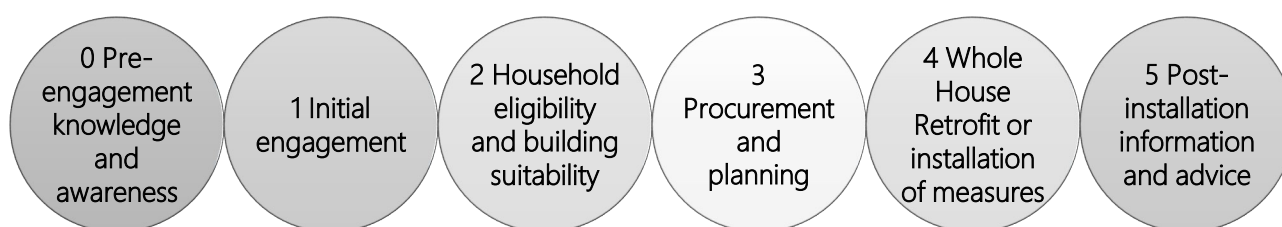
⁵⁸ National Energy Action (NEA) (2024) *UK Fuel Poverty Monitor 2022-23*. Available at: www.nea.org.uk/publications/uk-fuel-poverty-monitor-national-energy-action-2022-23/

linear, as there will be feedback loops and jumps across the process, adding layers of complexity to scheme delivery and to the assessment of barriers and enablers.

The research used evidence from the literature review, interviews and workshops to explore in depth the barriers and enabling factors for owner occupiers and social housing and PRS tenants, as tenure often plays a role in scheme design and eligibility. Findings are presented in detail in the customer journeys in Annex 3. Enabling factors include current solutions as well as potential enablers and solutions to barriers derived from the evidence collected.

Understanding the challenges and enabling factors in each tenure can inform tenure-specific policies, standards, regulations, planning and the scale of interventions required. Several points, however, are relevant across all tenures.

Figure 2: Energy efficiency scheme customer journey



The following sections discuss the barriers and enabling factors across the stages of the customer journey and describe how energy efficiency schemes play a role in supporting the net zero transition of fuel poor households. Key reasons why fuel poor households may not engage or disengage with the energy efficiency journey are also highlighted.

Barriers and enabling factors for stages in the customer journey

Pre-engagement knowledge and awareness

Challenges at this stage of the customer journey primarily relate to the themes of Attitudes and Behaviours; Knowledge, Information and Communication described in Table 1.⁵⁹

Interviews found that fuel poor households' general lack of awareness and understanding about net zero also applied to energy efficiency schemes. It was reported in the literature that households had a prevailing belief that the consequences of climate change will primarily affect future generations, leading to a sense of ambivalence towards energy efficiency improvements.⁶⁰ For fuel poor households, competing financial priorities exacerbated by the cost-of-living crisis prevented engagement and further action.

⁵⁹ The eight themes in Table 1 are: (1) Financial; (2) Knowledge, Information and Communication; (3) Regulation and Policy; (4) Buildings; (5) Operations; (6) Commercial and Supply Chain; (7) Attitudes and Behaviours; (8) Personal and Household.

⁶⁰ This prevailing belief and attitude could be said to apply broadly, not just to fuel poor households.

High fuel prices have focused consumer attention on energy-reducing behaviours and retrofit. However, there is a public preference for visible measures (solar PV, replacement windows) rather than insulation. There is a gap in public knowledge on measures that would be effective, their long-term benefits and how to plan retrofit improvements.

Evidence across data collection sources found that policy hiatus on Minimum Energy Efficiency Standards^{61,62} and lack of local authority capacity for enforcement have removed a clear driver for retrofit in the private rental sector. In contrast, in social housing, Awaab's Law, introduced in July 2023 as part of the Social Housing (Regulation) Act, will require registered housing providers to meet strict timelines for damp and mould to be inspected and repaired. Social housing tenants will be able to hold their landlords to account by taking legal action through the courts for a breach of contract.⁶³

The evidence suggests that across all tenures, the use of social and community connections and communications can help to share positive household experiences and the benefits of energy efficiency,^{64,65} e.g. via case studies, community champions, local advice outreach or visiting demonstrator homes. Interviewees found that encouraging small DIY improvements (like providing training in draught proofing) can enable households to take the first step in the retrofit customer journey.

Initial engagement

Barriers and enabling factors for households at this stage of the customer journey cut across all eight themes. The identification and targeting of eligible households is a key aspect of initial engagement, undertaken by local authorities, energy suppliers, installers, lead generators, housing providers, or third parties.

The research highlighted challenges around identifying households. There are a range of tools (e.g. Parity Pathways,⁶⁶ uZero⁶⁷) which can be used to identify households that combine a range of datasets, including EPCs, other housing data, Indices of Multiple Deprivation, fuel poverty risk, fuel prices and satellite data, to determine building density and access. However, these tools are

⁶¹ In 2021, the UK government consulted on introducing MEES for the PRS to be raised to EPC Band C for all new tenancies by 2025, and for all existing ones by 2028. In September 2023, this policy was shelved.

⁶² National Energy Action (NEA) (2024) *UK Fuel Poverty Monitor 2022-23*. Available at: www.nea.org.uk/publications/uk-fuel-poverty-monitor-national-energy-action-2022-23/

⁶³ AWAAB's law (2024) *National Housing Federation*. Available at: www.housing.org.uk/resources/awaabs-law/ (Accessed: 10 March 2024).

⁶⁴ Equality and Social Justice Committee (2022) *Fuel poverty and the Warm Homes Programme*. Welsh Parliament. Available at: <https://senedd.wales/media/occhtkio/cr-ld15117-e.pdf>

⁶⁵ Simcock et al (2023) *Written Evidence submitted to the Department of Energy Security and Net Zero Committee: Heating our Homes Inquiry*. Available at: <https://committees.parliament.uk/writtenevidence/123404/pdf/>

⁶⁶ Parity Projects (2023) *Pathways* Available at: <https://parityprojects.com/platform/pathways/> (Accessed: 10 March 2024).

⁶⁷ Urban Tide (2022) *uZero: Tackling the growing fuel poverty crisis with AI*. Available at: <https://urbantide.com/uzero>

subscription-based with costs attached, which may make the data inaccessible to organisations with limited resources.

Another approach identified in the literature and illustrated in the case study below is to use open-source data sets (EPC register, Department of Work and Pensions Stat-Xplore) and to start from a household vulnerability-based perspective rather than a scheme one.

Case study: Northern Devon Primary Care Fuel Poverty Crisis Programme

The Northern Devon Primary Care Fuel Poverty Crisis Programme was an initiative led by GP practices in North Devon, in partnership with South West Academic Health Science Network and 361 Energy. The programme used funding left over from the Covid Expansion Fund to address the impact of the ongoing fuel poverty crisis on health. A list of patients with high-risk respiratory conditions was linked with post codes in Northern Devon most at risk of fuel poverty using estimates of income levels and household energy data from the Home Analytics database.⁶⁸ The funding enabled NHS staff to phone these patients and offer them a home visit from a 361 Energy home energy advisor.⁶⁹ A total of 101 patients were referred to 361 Energy by four Primary Care Networks. Energy-related interventions including ECO measures, small measures, behavioural savings and financial assistance resulted in an average financial benefit per client of £1,017. Five retrofit opportunities were identified and grant referrals made.⁷⁰

The accuracy of data and whether it is up-to-date is paramount. In interviews, social housing providers highlighted the variability in quality of housing data and the labour and resource-intensiveness of data cleaning. EPC ratings offered an indication only of a property's energy efficiency, as tenants may have adapted their homes in ways which could affect potential installation works (e.g. a lean to).

Evidence from the literature review and interviews found that there is currently no government cross-department data matching to identify households that are likely to be fuel poor, without the need for new and complex data collection exercises. For instance, identification of whole household income or energy efficiency data (i.e. EPC) for those properties that do not have one.

The research found that a range of communication methods were used by stakeholders to initially engage households. These included local radio, door drops, outreach events, and targeted social media campaigns. Nevertheless, households' lack of awareness of schemes and distrust in schemes and scheme providers hampered initial engagement. Interview and workshop participants noted that there was not enough energy advice, which could be due to patchy availability of local trusted energy advice services. It was reported that fuel poor

⁶⁸ An Energy Savings Trust Home Analytics database contains information on UK housing stock to provide better information and target energy efficiency and fuel poverty interventions. Available at: <https://energysavingtrust.org.uk/service/home-analytics/>

⁶⁹ One Devon (2022) Teaming up with energy firm to tackle fuel poverty. Available at: <https://onedevon.org.uk/one-devon-news/teaming-up-with-energy-firm-to-tackle-fuel-poverty/>

⁷⁰ Hassall, O., Sanford, C. (2022) *Presentation Oct 22 Northern Devon Fuel Poverty Crisis Programme* [Power Point Presentation]. Available on request.

households are likely to mistrust information provided via cold calling by installers and online energy efficiency scheme offers.

The literature review and interviews found that social networks and relations could 'fill the gap' and promote greater awareness of energy efficiency benefits and uptake of schemes in a community, particularly where others have successfully received energy efficiency improvements. However, this may also propagate misinformation and mistrust if the experience was recounted as poor.⁷¹ Evidence from across all data collection methods suggested that word of mouth is a potent communication method to stimulate uptake of retrofit but can be a 'double-edged sword'.

Interview and workshop participants noted that short scheme bidding timescales and delivery deadlines such as SHDF funding waves have prevented the inclusion of additional considerations such as household vulnerabilities (health, English being the second language, learning needs, multi-generational households) as part of the delivery design process. Factoring in time and resources to scheme delivery for engagement with vulnerable groups would support initial engagement. Workshop participants reported that some social housing tenants require significant liaison over an extended period to establish trust in order to gain access to properties (a potential situation is described in Box 1).

Box 1: Charlie, social housing tenant (derived experiences recounted by participants in this research)

Charlie's social housing provider wants to install energy efficiency measures in their home. They suffer from severe mental health issues which makes allowing people to access their home difficult.

Charlie knows their neighbourhood officer well. They introduced Charlie to members of the installation team a year ago. Over that time, Charlie has got to know the team who would need to have access to their home and what will happen at each stage of the assessment and installation process. Charlie feels confident enough to grant access to the property and have the energy efficiency measures installed.

Interview participants recommended that initial engagement could be improved by making better use of data, such as fuel bills, smart meter data and vulnerability data. Scheme eligibility criteria targeted at the most vulnerable was considered useful but requires clear information governance guidance for health professionals on use of patient data. For instance, ECO4 includes a referral pathway for NHS staff to make referrals of patients with cold-related health conditions based on NICE guideline NG6. However, more broadly participants perceived there to be a lack of clarity in the health service on the use of patient data (without prior patient consent) for this purpose.

⁷¹ Owen, A. *et al.* (2023) Who applies for energy grants? *Energy Research & Social Science*, 101, p. 103123. <https://doi.org/10.1016/j.erss.2023.103123>.

Household eligibility and building suitability

On household eligibility, interview and workshop participants viewed means-tested benefits as not the best proxy for identifying households in fuel poverty. Some people living in low-income households do not take up means-tested benefits or may be ineligible. It was felt that more nuanced eligibility criteria (e.g. some local authorities use ECO Flex) could enable better engagement with such households. Interviewees had contrasting perspectives on the income threshold for ECO Flex eligibility;⁷² one group viewed the threshold as useful for targeting fuel poor households, while another considered it too low. Some local authorities request an increase to the minimum household annual income threshold to reflect local circumstances. Eligibility criteria, therefore, can be a barrier to scheme participation, even if a household is in fuel poverty.

During the eligibility stage of the customer journey, the time required by fuel poor households to commit to schemes was found in interviews to be a barrier. For fuel poor households juggling multiple jobs or with demanding lives, time could be in short supply. Scheme bureaucracy – the paperwork and information required to prove eligibility – was perceived by interview participants as intrusive or was challenging to obtain (for instance, by older people).

Furthermore, fuel poor households could be deterred from further engagement if additional financial support to cover upfront costs associated with decarbonisation or hidden costs like upgrading an electricity connection was not available.⁷³

Interviewees highlighted two factors that they thought prevented private rented tenants from taking further steps in the retrofit process. Private tenants feared eviction due to lack of tenant protection, for example if they complained to landlords about housing conditions; they also feared rent increases if energy efficiency improvements were made. Both prevented further steps in the retrofit process. Scheme eligibility can also prevent landlord participation (for instance, EPC Band D rated properties are not included in ECO for private landlords; for HUG, a landlord cannot own more than four rental properties and must contribute at least a third of the cost of the upgrade).⁷⁴

Evidence from interviews and workshops found that one of the main reasons for scheme dropouts was the long wait time households experienced between submitting the application and having a building survey. Once the building survey was completed, further barriers to scheme participation became apparent. Some were practical issues that related to the building itself like siting of a heat pump, space requirements for measures, or conservation and planning issues. Alternatively, the building survey might find that the work was not commercially viable for the installer to undertake, which could be frustrating for the household.

⁷² For ECO Flex, this is £31,000 gross household annual income.

⁷³ National Energy Action (NEA) (2021) *UK Fuel Poverty Monitor 2020-21*. Available at: www.nea.org.uk/publications/uk-fuel-poverty-monitor-2020-21

⁷⁴ Private landlords are eligible under ECO4 if the EPC is rated Band E-G (subject to other conditions being met); for HUG2, the landlord can have a maximum of four properties.

Another barrier was the lack of public understanding about how buildings work, in particular the need for ventilation. Workshop participants cited the need for ventilation (door cut offs, extractor fans) as a significant cause of dropouts from schemes. Participants also gave examples of tenants incorrectly believing that wall insulation could lead to damp and mould, with this leading to scheme dropouts. Better public understanding about appropriate measures, ventilation and retrofit advice tailored for each home could combat this. Evidence from interviews suggested that air tightness testing could also be made standard practice in the assessment process, which for a small additional cost, may negate the need for some ventilation measures.

Other reasons for fuel poor households dropping out of schemes identified in interviews and workshops were short-term thinking (households focusing on immediate need) and the challenge of having multiple people involved in the retrofit assessment and installation process visiting the home. Households also feared that schemes would be over-subscribed or short-lived (e.g. the Green Homes Grant Voucher Scheme). Furthermore, evidence from the literature review found that disabled people might drop out of schemes if their needs were not met (e.g. notice for appointments, face to face or non-digital advice, tailored implementation).⁷⁵

In interviews, participants reported that dropout data was not being monitored and better data on this was needed. For social housing providers, better information on tenant refusals could enable greater involvement of tenants in future works.

Procurement and planning

The following vignette (Box 2) illustrates uncertainties which could lead someone in fuel poverty to drop out of a scheme at the procurement and planning stage of the customer journey.

Box 2: Jane, owner occupier (derived experiences recounted by participants in this research)

Jane is retired, has an income of less than £30,000 a year with few savings and lives alone in an end-of-terrace house. The property is rated EPC Band E due to the inefficient heating system. Jane's fuel bills are over £300 a month, causing her a lot of concern. She found out that there were grants available for heating system upgrades through her neighbours who'd had measures installed. After looking online, Jane came across different schemes with varying eligibility criteria, but she struggled to know which scheme was right for her. Once she found information on her local council's website, she found out more about the HUG from an energy advisor and her application processes went ahead smoothly.

An assessor surveyed her property five weeks ago to decide what measures will be installed. Jane has not heard anything since. She knows there will be some disruption to her home, depending on what is installed. Jane feels she is stuck in limbo waiting for that decision to be made, causing her stress. She is also concerned about the quality of the work and doesn't know who to contact in case there are issues with the installation. Jane is apprehensive about how she

⁷⁵ UKERC (2018) *Policy pathways to justice in Energy Efficiency*. Available at: <https://ukerc.ac.uk/publications/policy-pathways-to-justice-energy-efficiency/>

will manage the new system once it has been installed and hasn't been advised on what support will be available to her post-installation. She is scared that her bills may go up by mis-using the systems – something that she cannot afford as that would put her in a worse situation.

Lack of time was cited again by participants as a reason households drop out of schemes at the procurement and planning stage. It was reported that personal or household circumstances could make it difficult for fuel poor households to find time to be at home for a retrofit assessor to survey the property (or for an installation to be carried out) if working multiple jobs or on zero-hour contracts. Failed structural surveys and lack of choice on measures also deterred households from further participation in schemes. For instance, an interviewee reported that some households refused a heat pump as it was an unfamiliar technology or due to running costs. The change in building appearance from external wall insulation can also deter people from proceeding with its installation.

Disruption relating to pre-installation or remedial works (repairs, asbestos removal, loft clearance) and due to the installation of measures themselves was another barrier.⁷⁶ Literature review and interview findings suggested that households favour solar PV and new windows rather than insulation, as these measures cause less disruption and enhance property value. Solar PV was also considered to be a visible indicator of environmental values.

Overall, in interviews and workshops, the barriers felt to be most pertinent at this stage were the long lead time it took to get works done and householder frustration with the process. In interviews, administrative delays with the batch process – in which retrofit improvements for a batch of 20-30 households are signed off for action – could put energy efficiency improvements on hold for all households involved. The hassle of the process and changes to household circumstances in the intervening period could stop retrofit being a priority for them. Interviewees suggested that the lack of supply chain capacity as well as processing problems lay at the root of this issue. Households could drop out a long way along the customer journey after significant investment of time and resources by themselves and the retrofit professionals.

Participants were of the view that a single point of contact that builds a relationship with the household and coordinates the retrofit or low carbon technology installation could combat this issue. Another suggestion from participants was to share information on PAS requirements in advance, for example on ventilation, so the customers know what to expect, and to update customers via email after each intervention. Education, awareness and ongoing support could counter long lead times.

Interviewees also suggested that retrofit coordinators need people skills as well as technical skills. This is particularly the case if they are engaging with vulnerable fuel poor households where greater flexibility and understanding might be required, for instance, additional support for disabled consumers.⁷⁷ A workshop participant commented that increasing the gender and

⁷⁶ Resources for enabling works like loft clearance are sometimes available.

⁷⁷ Research Institute for Disabled Consumers (2024) *Understanding Disabled Consumers Needs in Relation to Smart Energy Options*. Report for Centre for Sustainable Energy. Available on request.

ethnic diversity of trained installers and retrofit professionals could also support greater trust in the supply chain by households.

Whole House Retrofit or installation of measures

Research found that operational barriers, particularly long wait times between installation of several different measures, could lead to households dropping out of schemes.

Householder preference for certain measures can present a challenge. The Green Homes Grant Voucher scheme required the installation of primary and secondary measures. If the householder was interested in one measure but not the other, they might drop out if their favoured measure was installed first, resulting in problems for the supply chain. Another challenge raised by interviewees was the lack of time installers had to discuss heating and behaviour changes with households who received a heat pump.

Interviews found that access barriers could also block installations. These included installer transport (lack of parking) and inability to access the property due to time-poor household schedules. With installer time at a premium, the latter barrier could lead to works not going ahead, with installers focusing attention on households that were available. In workshops, it was reported that some households had safety concerns about granting access to their home (Box 1: Charlie) or were unable to temporarily vacate the property to enable works to occur due to health issues.

The private rental sector vignette in Box 3, below, illustrates challenges at this customer journey stage. Interview and workshop participants suggested the following could improve engagement of households at this stage of the customer journey: longer-term schemes to reduce supply chain pressures; the provision of ongoing support during the retrofit process; physical inspections for quality assurance of installations; and providing households with information about recourse.

Box 3: David, private landlord (derived experiences recounted by participants in this research)

David rents out a poorly insulated property with electric radiators. He has a good relationship with the tenants, a young family that have lived there for ten years. His tenants were not aware of energy efficiency measures or low carbon technologies.

The tenants were eligible for ECO4 and applied online for loft insulation and a heat pump. The family were not guided through the process and there was no discussion around what measures would be most suitable. No information was given to the tenants or David before works started on the property. It was not explained to the tenants what was being installed.

Both the tenants and David were concerned by the lack of discussion and planning. David contacted Trustmark and the contractor about the lack of communication.

Post-installation information and advice

In interviews, one of the key barriers raised at the post-installation stage across all tenures was a lack of household information or knowledge of their new heating system or energy efficiency measure. For example, households may not understand how to operate their system, or the behavioural changes that will result from their energy efficient home. For those in the private rental sector or social housing, a further challenge cited was the lack of handover on how to use the system when a new tenant moves in.

The other key challenge cited centred around the difficulty for fuel poor households of resolving any issues with their installation. A lack of a clear, streamlined escalation and complaints process for consumers was reported by participants to cause stress and confusion. Households can find it difficult to know who exactly they should be escalating issues to. For example, under ECO4, a household may have been mainly dealing with their supplier and had little contact with the installer. A discussion paper included in the literature review explained that if something goes wrong, the energy company is not responsible for dealing with installation complaints, and the household may struggle to get in contact with their installation company.⁷⁸ The report highlighted that this is a long-term issue as households not familiar with the measures will find it hard to spot good from bad work and so any installation issue, particularly with energy efficiency, could take months or years to come to light.⁷⁹ Insulation faults can create financial challenges for fuel poor households if there is no funding allowed for repairs. In the SHDF Demonstrator evaluation, evidence from interviews conducted with social housing tenants found that participants were less likely to report lower energy bills where there were unaddressed issues.⁸⁰

Interviewees reported that clear, comprehensive post-installation support that ensures fuel poor households understand their system, have access to advice to ask questions about their system, and know where they should report any concerns or issues would combat some of the issues outlined above.

It was also suggested that consumer protection through guarantees and recourse for households could improve the customer journey experience. Guarantees that span a significant length of time support household confidence that issues can be resolved. In person monitoring of measures installed can help ensure faults are spotted, as well as ensuring that households can operate their system. Evidence from interviews and the literature review suggested the idea of a

⁷⁸ Citizen's Advice (2020) *Lessons for net zero: What past energy efficiency and low carbon home improvement schemes tell us*. Available at: <https://www.citizensadvice.org.uk/about-us/our-work/policy/policy-research-topics/energy-policy-research-and-consultation-responses/energy-policy-research/lessons-for-net-zero-what-past-energy-efficiency-and-low-carbon-home-improvement-schemes-tell-us/>

⁷⁹ Ibid

⁸⁰ Department for Energy Security and Net Zero (2024) *Whole House Retrofit and Social Housing Decarbonisation Fund Demonstrator: Joint outcome and economic evaluation*, GOV.UK. Available at: www.gov.uk/government/publications/whole-house-retrofit-and-social-housing-decarbonisation-fund-demonstrator-joint-process-evaluation It should also be noted that the SHDF Demonstrator did not aim to alleviate fuel poverty.

licensing approach so that consumers could report installers to have their license removed if an installation is not done correctly.⁸¹

Standard setting and quality assurances can ensure installations are up to scratch in the first instance. Interviewees reflected that the introduction of the PAS 2035 monitoring and evaluation standards was a step in the right direction in this regard, but there remained concerns around how well it provides consumers with access to recourse if anything were to go wrong.

The customer journey is complex and can take different pathways depending on specific situations and circumstances. The following section discusses in more detail some of the reasons that encourage take-up of schemes and the impact on fuel poverty observed for these schemes.

Fuel poor households take-up of scheme support

Barriers identified in the previous section act not only as deterrents but also become the reasons for households to drop out of schemes. Currently, there are no systematic data collection approaches to monitor dropouts and reasons for refusal. Interviewees highlighted that better monitoring of dropout data and improved information on tenant refusals for social housing providers could enhance future participation.

Interviews cited solutions that could improve households' take-up of schemes. Research participants suggested that joining up scheme support, for example, by using the Great British Insulation Scheme to 'pilot' first time engagement with vulnerable households with a quick win insulation install, could then link the household into ECO4 for further measures. The following case study illustrates how joining up scheme support can significantly improve an area.

Case study: Leeds City Council Priority Neighbourhoods Approach

Leeds City Council Priority Neighbourhoods Approach to retrofit⁸² is a multi-agency approach in an area of high fuel poverty. Initially, 40 council homes had external wall insulation installed. This generated a sense of community pride and community cohesion. Residents also reported that their homes were warm but that they did not need to put the heating on as much. Evaluation by Leeds Beckett University found a 6°C increase in internal temperature in one home, comparing pre- and post-installation periods.

Leeds City Council stitched together funding streams from West Yorkshire Combined Authority, ECO4 and council regeneration funding to make these retrofit improvements, which cost £30,000 per home. It considered the health benefits, education benefits, job creation and skills development of the local supply chain before investing in these energy efficiency improvements.

⁸¹ Informed by research with trade bodies, but 'license to trade' outlined in: Killip, G. *et al.* (2021) *Building on our strengths: a market transformation approach to energy retrofit in UK homes*, Federation of Master Builders/Centre for Research into Energy Demand Solutions. Available at: www.creds.ac.uk/building-on-our-strengths-transformation-to-energy-retrofit

⁸² Munson, G. (2024) *UK100 explained: Retrofit Priority Neighbourhood Approach: UK100, Explained: Retrofit Priority Neighbourhood Approach*. Available at: <https://www.uk100.org/node/411>

The council's focus on developing the supply chain and building trust via community engagement has resulted in a successful model for retrofit. Now people are investing in their own homes and the area is a working community again, not a no-go area.

Interviewees suggested that fuel poor households' trust could be built at initial engagement by employing local people in a community task force to promote schemes. Trust could also be built with households by scheme delivery agents working in partnership with trusted intermediaries such as very local community groups. These were found to be particularly effective at engaging with ethnic minority groups, refugees and the digitally excluded.

A lack of trust by community groups of sharing client data with private companies or the government was perceived by interviewees as potentially limiting the effectiveness of this approach. Providing reassurance on this to trusted intermediaries could aid engagement with fuel poor households.

Interviewees reported that targeted and direct contact with fuel poor households could be fruitful. Direct contact with the public via community outreach was considered effective, although costs to do so were not covered by scheme admin budgets.⁸³ An interviewee reflected that the localised delivery approach used for the CERT scheme⁸⁴ had resulted in high scheme take-up. Targeted door knocking with households thought to be in receipt of means-tested benefits could check their scheme eligibility quickly on the doorstep. This approach was found to be particularly useful for certain groups (people with learning difficulties, those for whom English is a second language), as households could then be helped with paperwork.

Different communication and engagement methods could benefit households with vulnerabilities. Home visits to see the property and the person were valued as a means to understand the household's situation and to aid ongoing engagement of those unlikely to attend community events and the digitally excluded. Telephone advice was useful for people often at home. It was also suggested that the burden of scheme admin could be reduced for fuel poor households by completing the application form with them over the phone, then sending them the signature page with a copy of the pre-populated document. Households did not then need to spend further time filling in forms.

Interviewees considered that greater resources were required for resident liaison and community engagement; little remained for this in scheme admin support budgets. The Warm Homes Fund, which combined measures installation, advice and support, is an example of a scheme where ongoing customer liaison was prioritised. Participants were of the view that advice and support elements in schemes for fuel poor households could facilitate enabling

⁸³ Outreach that provided information on scheme grants was funded via advice work not scheme budgets.

⁸⁴ CERT (Carbon Emissions Reduction Target) was a pre-2012 UK energy efficiency scheme which made energy efficiency measures available to all consumers but required a proportion of reductions to come from low-income households. Department of Energy and Climate Change (2014) Evaluation of the Carbon Emissions Reduction Target and Community Energy Saving Programme: Executive Summary. Available at: https://assets.publishing.service.gov.uk/media/5a7da671e5274a5eaea6580f/CERT_CESP_Evaluation_Exec_summary.pdf

works, health adaptations (e.g. handrails) and access to other funding such as small grants (e.g. for repairs).

The literature review and interviews found that households could be helped to take up scheme support and remain engaged in the customer journey by providing wraparound 'end-to-end' services.⁸⁵ Client liaison via a single point of contact (retrofit or advice professionals), with one phone number to call throughout the retrofit process and aftercare, could avoid negative feedback and experiences. The role of local energy advice providers to give post-installation advice to households on the use of heat pumps, rather than the installer, was also raised in interviews.

Effectiveness of energy efficiency schemes in alleviating fuel poverty

Government funded energy efficiency schemes are subject to monitoring and evaluation. The purpose of these evaluations is to assess and understand the overall value for money of the schemes and the extent to which they are achieving their intended outcomes, one being to support households in fuel poverty. The next section describes how evaluations have assessed the impact schemes have had on fuel poor households. The review focuses on the most recent published evaluations, including: Energy Company Obligation (ECO 2t and 3) and Green Home Grant Voucher Scheme (GHGVS).

ECO 2t and 3

Evidence from ECO 2t and 3 evaluations⁸⁶ shows that the scheme reached households on relatively low incomes, with around two in five (42%) households having an annual income of less than £16,000. Two thirds (67%) of households receiving ECO support were also receiving state benefits, and around half (49%) of households supported received some sort of help towards paying for fuel bills. The evaluation demonstrates that ECO 2t and 3 had targeted and delivered to those likely to be in fuel poor situations. It also found that for households surveyed, 73% had experienced improved thermal comfort and 24% perceived a positive impact on the health of someone in their household, both aspects which are linked to fuel poverty. However, the evaluation did not explicitly assess the extent to which it enabled households to be lifted from fuel poverty following the installation of measures, providing a direct link between the energy company obligation scheme and fuel poverty targets. The recently commissioned ECO4 evaluation will be looking at those aspects more explicitly through a contribution analysis approach.

⁸⁵ Chartered Institute of Housing Cymru (2022) *Decarbonising Wales' private rented sector: Tackling the energy crisis to meet net zero*. Available at: <https://cih.org/media/zbccclbu/0510-ttc-decarbonising-wales-private-rented-sector-v5.pdf>

⁸⁶ Department for Energy Security and Net Zero (2023) *Evaluation of the Energy Company Obligation (ECO) Phases 2t and 3*. Available at: <https://www.gov.uk/government/publications/evaluation-of-the-energy-company-obligation-eco-phases-2t-and-3>

GHGV Scheme

The GHGV Scheme⁸⁷ evaluation used modelling of participating households' fuel poverty status by developing a proxy based on a series of data points to determine which households were considered fuel poor under the LLEE metric – both prior to, and after, the measures were installed through the scheme.⁸⁸ This analysis estimated that 57% of applicant households were likely to have been in fuel poverty prior to installation, with most of the homes treated being EPC Band D or below. These findings therefore suggest that the scheme was successful at attracting and targeting those more likely to be fuel poor by attracting those living in the least efficient homes. Following GHGV installations, the modelling suggests that 14% of fuel poor households were lifted out of fuel poverty. This could be explained by most of the installation to these homes being single measure installations, limiting the energy efficiency gains. Overall, the evaluation suggests that the contribution of the scheme to addressing fuel poverty was likely to have been lower than its original ambition.⁸⁹

Specific challenges with measuring impact of schemes on fuel poverty

There are specific challenges when trying to measure and isolate the impact of energy efficiency schemes on fuel poor households, such as the existence of unobservable, hard to measure factors (e.g. stress, working patterns) and its relation to other variables (e.g. changes in occupancy, health and income). The evaluation examples above provide a useful overview of the variety and variability of approaches to demonstrating impact and the challenges that exist when trying to measure the impact of schemes in reducing fuel poverty.

⁸⁷ Department for Energy Security and Net Zero (2023) *Green Homes Grant Voucher Scheme: evaluation*. Available at: www.gov.uk/government/publications/green-homes-grant-voucher-scheme-evaluation

⁸⁸ The analysis did not include post-installation assessment of income, and this was assumed to remain the same. Similarly, other factors which influence a household's fuel poverty status, such as household composition, household income, fuel prices and any other changes to the dwelling, were held constant.

⁸⁹ Chapter 5 in the evaluation report covers the specifics in more detail.

Participation and role of government and other actors to support attainment of 2030 fuel poverty target

This section explores the role of three key actors to attain the 2030 fuel poverty target: national government; regional and local government; and local delivery partners. The role of innovation in retrofit technology and energy service delivery is also discussed.

Evidence from all data collection sources found that national and local actors will need to align and work effectively together to attain the 2030 fuel poverty target.⁹⁰ Success will depend on national government enabling more regional and local area-based delivery to effectively target and meet the needs of fuel poor households whilst simultaneously developing the supply chain.⁹¹

National Government

Evidence from the literature reviewed and stakeholders suggested that to meet the fuel poverty target, national government has multiple roles:

- Set a clear and consistent long-term policy direction.
- Support this with a centralised communications campaign.
- Ensure scheme funding offers the support needed to address fuel poverty.
- Simplify the scheme landscape and customer journey.
- Form cross-departmental links to enable a multi-faceted approach to tackling fuel poverty.
- Remove barriers to data sharing to improve identification and targeting of fuel poor households.
- Take action in the private rental sector.
- Assign local authorities with responsibilities to address fuel poverty.

Having a clear and consistent fuel poverty strategy is vital to achieving the goal. Participants noted that there can be a tendency to bring together several priority objectives, namely addressing fuel poverty, net zero and energy efficiency, which are similar but the delivery of which might not always completely align. It was felt that clarity over which should take precedence was important. Ensuring this remains consistent over time was also considered key.

⁹⁰ Simcock et al (2023) Written Evidence submitted to the Department of Energy Security and Net Zero Committee: Heating our Homes Inquiry. Available at: <https://committees.parliament.uk/writtenevidence/123404/pdf/>

⁹¹ London Economics (2023) Understanding the challenges faced by fuel poor households. Available at: <https://londoneconomics.co.uk/blog/publication/understanding-the-challenges-faced-by-fuel-poor-households-may-2023/>

Evidence from interviews and the literature suggested that national government should develop a centralised communications campaign around net zero, low carbon heat and energy efficiency.⁹² A central campaign was perceived as potentially more compelling than local messaging alone. It was suggested that this campaign would aim to:

- raise awareness of the case for change (including the benefits for households) and promote the opportunities available;
- address myths like concerns about technology, fears that bills could be higher and specific installation concerns (e.g. that ventilation can cause draughts);
- reassure the public about trusted sources of advice, quality standards and recourse.

The government Welcome Home to Energy Efficiency campaign⁹³ is a recent addition to advice for households on energy efficiency improvements which begins to address these aims.

It is also vital to ensure that scheme funding is sufficient to meet demand for improvements and to cover any fuel poor households' additional needs (like hidden or associated installation costs). Interviewees highlighted specific concerns relating to the size of grants available for homes that are more expensive to retrofit, including off-gas grid properties, and the need for additional budget to make them retrofit ready. Additionally, in order to achieve the fuel poverty target, participants highlighted the need to find ways to fund the improvements of blocks of flats or streets of houses (particularly terraced housing – with a shared wall) where not everyone qualifies for support, but where there will be economies of scale or it is otherwise practically impossible to provide support to a single household.⁹⁴

Evidence from interviews and workshops found that having multiple schemes for similar purposes can be a source of confusion to fuel poor households and adds unnecessary complexity. Simplifying both the energy efficiency scheme landscape and the customer journey of schemes themselves could increase householder uptake and reduce scheme dropout.

Some flexibility in scheme delivery was considered important. For example, stakeholders suggested that regional and local area-based delivery could be beneficial. This included meeting different local heating needs, housing stock and household demographics. For instance, requiring the installation of a heat pump instead of storage heaters and thermal batteries might limit the effectiveness of the scheme, further flexibility was highlighted regarding the target to increase efficiency by two EPC Bands.⁹⁵ It was also suggested that eligibility criteria could be tailored locally based on knowledge of household circumstances and the supply chain.

⁹² Orbit Housing and Chartered Institute of Housing (2021) Working with customers to make net zero carbon a reality. Available at: <https://orbitgroup.org.uk/media/2344/climate-change-report.pdf>

⁹³ <https://energy-efficient-home.campaign.gov.uk/>

⁹⁴ See also E3G (2023) *Enabling locally led retrofit*. Available at: <https://www.e3g.org/publications/enabling-locally-led-retrofit/> (Accessed: 13 March 2024).

⁹⁵ For example, ECO4 has a minimum requirement for the property EPC rating improvement to at least Band D (F-G properties) or Band C (D-E properties for owner occupiers; E for PRS). Outlined in: Ofgem (2023) *Energy Company Obligation (ECO4) guidance: Delivery*. pp. 21-27. Available at: [www.ofgem.gov.uk/sites/default/files/2023-02/ECO4_Delivery_Guidance_v1.1_\(1\).pdf](http://www.ofgem.gov.uk/sites/default/files/2023-02/ECO4_Delivery_Guidance_v1.1_(1).pdf)

However, having some basic guidelines, such as the importance of improving the fabric⁹⁶ of the house before installing new heating systems, was thought to be important.

Findings from the literature review and interviews suggested that national government work was needed across departments to identify common benefits and promote systems thinking. For example, working with the Department of Health and Social Care (DHSC), framing fuel poverty as a social determinant of health and addressing it via a social prescribing approach⁹⁷ or Warm Homes on Prescription.⁹⁸ Also, working with the Department for Education (DfE) on skills and apprenticeships,⁹⁹ producing a national skills strategy and action plan to improve the size, skills and capabilities of the supply chain.

A key aspect identified by stakeholders and the literature review was national government's role in enabling data sharing across government departments to identify and target households that are likely to be fuel poor.¹⁰⁰ Data sharing between the Department for Work and Pensions (DWP) and Valuation Office Agency is currently used to identify low-income high energy use households for ECO.¹⁰¹ Similarly, data sharing between DESNZ, DWP and Department for Levelling Up, Homes and Communities (DLUHC) could generate a database for UK homes with income, property and energy efficiency data. Processes for matching Health Service patient postcode data with fuel poverty risk, income and EPC data could implement NICE guideline NG6¹⁰² and improve use of health-related referral pathways for ECO4.

Stakeholders also suggested that national government could facilitate wider data sharing to help achieve the 2030 fuel poverty target. This could include a universal Priority Service Register (PSR) or cross-sector vulnerability register (integrating data from utility suppliers and distribution network operators, the Energy Ombudsman and other service providers). This is something that

⁹⁶ Importance of the 'fabric first' approach is outlined in: National Energy Action (NEA) (2021) *UK Fuel Poverty Monitor 2020-21*. Available at: www.nea.org.uk/publications/uk-fuel-poverty-monitor-2020-21/

⁹⁷ Lawler, C. et al. (2023) Homes and Health in the Outer Hebrides: A Social Prescribing framework for addressing fuel poverty and the social determinants of health, *Health and Place*, 79, p. 102926. doi:10.1016/j.healthplace.2022.102926.

⁹⁸ Warm Homes on Prescription is an approach where a GPC prescribes that a patient with a cold-related health condition has their heating bill paid in winter to ensure they live in a warm home. Energy Systems Catapult. (no date) *Warm Home Prescription* Available at: <https://es.catapult.org.uk/project/warm-home-prescription/>

⁹⁹ Zhao, J. (2023) Implementing net zero affordable housing - towards a human-centred approach, *Journal of the British Academy*, 11(s4), pp. 9–34. doi:10.5871/jba/011s4.009.

¹⁰⁰ Atkins, E. (2023) 'Home', in *A Just Energy Transition. Getting Decarbonisation Right in a Time of Crisis*. Bristol University Press.

¹⁰¹ Suggested a possible mechanism in: Tozer, L., MacRae, H. and Smit, E. (2023) Achieving deep-energy retrofits for households in Energy Poverty, *Buildings and Cities*, 4(1). doi:10.5334/bc.304. DESNZ comment (AS 04.04.24) that this is the process used to identify ECO-eligible housing.

¹⁰² National Institute for Clinical Excellence (2015) Excess winter deaths and illness and the health risks associated with cold homes. Available at: <https://www.nice.org.uk/guidance/ng6>

was considered under the *Smarter regulation: strengthening the economic regulation of the energy, water and telecoms sectors* consultation.¹⁰³

Evidence from all data collection sources identified the need for greater national government action on tackling fuel poverty in the private rental sector. This could include increasing MEES requirements to the preferred policy scenario suggested in the 2021 government consultation,¹⁰⁴ along with strengthening tenant protections against eviction and rent increases. Resourcing local authorities to ensure that MEES is enforced, enabling use of council tax and other data sources to aid local authority identification of private landlords, and establishing a national private landlords register could also address fuel poverty in this housing sector.

Finally, it was noted in interviews that local authorities are not currently mandated to act on fuel poverty. A national government requirement to do so would support attainment of the target. It would stimulate strategic planning and integrated action on fuel poverty across local authority departments and across sectors, making the best use of local knowledge to optimise targeting of interventions and use of resources.

Regional and local government

According to the literature, while national government will set the policy objectives and ensure that barriers are removed, regional or local level delivery was seen to play a fundamental role to realise the ambition.¹⁰⁵ The regional net zero hubs have a key role to play in supporting local authorities to deliver national policy locally. Stakeholders identified that it could be valuable to have local government in a co-ordinating role for delivery, utilising local knowledge and bringing together different funds to provide a single entry point to grant support. Ideally, the local team could also screen and batch applications to make delivery more efficient.

However, delivering this role successfully will require either ringfenced budget or a new statutory duty¹⁰⁶ given the current pressures on local government. Interviewees suggested creating local and regional networks to share resource to support local applications, implementation and delivery. This is occurring via Net Zero Hubs to some extent. However, these have limited resources and focus primarily on net zero, not fuel poverty. Improved knowledge and sharing of housing ownership data between local authorities and social housing

¹⁰³ Department for Business and Trade (2024) *Smarter regulation: strengthening the economic regulation of the energy, water and telecoms sectors*. Available at: <https://www.gov.uk/government/consultations/smarter-regulation-strengthening-the-economic-regulation-of-the-energy-water-and-telecoms-sectors>

¹⁰⁴ New tenancies required to reach an energy efficiency rating in Band C from 1 April 2025 and all tenancies to reach a C-Band rating by 1 April 2028. Department of Business, Energy and Industrial Strategy (2020) *Improving the Energy Performance of Privately Rented Homes in England and Wales*. Available at:

<https://assets.publishing.service.gov.uk/media/5fdcc67fe90e07452fce4e12/prs-consultation-2020.pdf>

¹⁰⁵ Simcock *et al.* (2023) *Written Evidence submitted to the Department of Energy Security and Net Zero Committee*. Available at: <https://committees.parliament.uk/writtenevidence/123404/pdf/>

¹⁰⁶ E3G (2023) *Enabling locally led retrofit*. Available at: <https://www.e3g.org/publications/enabling-locally-led-retrofit/> (Accessed: 13 March 2024).

providers could support wider roll-out of schemes and delivery in the private sector (e.g. in properties that were previously social housing).

Local delivery partners

Some stakeholders suggested that local authorities can provide the necessary support for households, but most advocated for local independent advice services qualified to provide advice on all options for consideration. It was felt that an independent service would be less likely to promote particular technologies or installers and that this would ensure that households navigated the sector successfully. Specifically, stakeholders believed that such a service should:

- Provide tailored and genuinely relevant advice, specific to the property and to the household and their lifestyle.
- Be local, to establish trust and build on local knowledge, including expertise in rural or urban settings as appropriate.
- Be easily accessible, ideally offering opportunities to meet face to face and not expecting households to come forward without support and encouragement.
- Be engaging, to raise awareness and drive demand. Use levers and low-cost 'hooks' such as offering thermal imaging, or giveaways of energy saving equipment to draw people into an initial discussion.
- Be inclusive, enabling participation for those marginalised due to technological barriers (e.g. digitally excluded), health barriers or others.
- Provide support throughout the customer journey including ensuring sufficient after care so that households know how to use their new technologies efficiently.

It was argued in one paper that such a service is likely to be most effective if it builds partnerships with other local organisations.¹⁰⁷ These partnerships could lead to direct referrals, general or targeted mailouts, or potentially provide a venue for drop-in sessions. Interviewees suggested that it may be necessary and cost-effective to pay partners or a community task force for their help in identifying warm contacts. Workshops and interview participants identified relevant partners to include:

- **Public sector** – GP services (who might refer directly, for example through social prescribing,¹⁰⁸ and could help identify people likely to benefit by sending out mailings), hospitals (especially where seeking to discharge patients and arranging necessary home adaptations), and also children's centres, job centres, local libraries and schools.

¹⁰⁷ Institute for Public policy Research (IPPR) (2023) *More than money: Moving towards a relational approach to retrofitting*. Available at: <https://www.ippr.org/articles/more-than-money>

¹⁰⁸ A social prescribing framework is discussed in: Lawler, C. *et al.* (2023) Homes and Health in the Outer Hebrides: A Social Prescribing framework for addressing fuel poverty and the social determinants of health, *Health and Place*, 79, p. 102926. doi:10.1016/j.healthplace.2022.102926.

- **Third sector** – Community centres, groups, clubs or cafes for outreach and information sharing; charities with a relevant focus, such as debt support, food banks and mental health, for information and referral partnerships.
- **Other partners** – Utilities (water and energy companies both have priority service registers which might help target support); fire and safety services; faith leaders.

Innovation in retrofit technology and energy service delivery

Finally, there are technical opportunities which could help encourage uptake. Specifically, stakeholders outlined the importance of making existing technology easier to use, improving on the technology available (for example, so that there are better solutions for households without space for a heat pump, and where existing insulation solutions are not appropriate). More significant changes were also suggested, such as offering heat as a service, which could potentially transform the sector while managing the risk for fuel poor households.

Conclusions, policy implications and recommendations

The findings in this report reinforce the intricacies and interconnectedness between fuel poverty, energy efficiency, and net zero. This report identifies barriers and enablers that underpin the delivery of energy efficiency schemes and the net zero transition, some of which are already well-documented in existing research. This report aims to bring some of these existing elements together and provide further recommendations to support fair transition of fuel poor households to net zero. This section presents conclusions and recommendations based on evidence gathered from the literature review, interviews and workshops.

Conclusions

Net zero transition of fuel poor households

Energy efficiency schemes have been the main mechanism to improve energy efficiency, reduce carbon emissions and energy bills, and as such, support fuel poverty reduction. This report highlights and reinforces that the challenge of transitioning fuel poor households to net zero is a multifaceted issue that intersects with the broader 'energy trilemma' of security, affordability, and environmental sustainability. While carbon reduction, energy efficiency, and addressing fuel poverty are distinct objectives, they are deeply interconnected and must be considered collectively and should be looked at wider than through the delivery of energy efficiency schemes. This creates a complex scenario provided that efforts to reduce carbon emissions and improve energy efficiency must be balanced with the need to ensure that fuel poor households can have a fair and just transition to net zero.

This complexity in turn requires a delivery approach which combines elements around energy efficiency measure installation, adoption of low carbon technologies, and a supportive policy and regulatory environment. Through the engagement with stakeholders, the research identified eight key overarching barriers and enabling factors that affect fuel poor households and their transition to net zero. This report explores these different themes across a defined energy efficiency customer journey.

Variability of barriers and enablers based on personal and household characteristics

This report also highlights that there are barriers and enablers which are specific to, or exacerbated by, personal and household characteristics, such as age and tenure. The research highlighted that older individuals face financial constraints despite having certain assets, e.g. owning a home. Fuel poor households with English as a second language encountered communication barriers and difficulties accessing translated information. People with disabilities struggle with obtaining the appropriate support throughout the retrofit process. Fuel poor households in the private rented sector faced significant barriers to transitioning to net zero, including regulatory hurdles and the lack of financial incentives for landlords. Social housing

properties, while more energy-efficient, had lower-income tenants and faced challenges with tenant engagement. Overall, tailored approaches and improved training could help to address the diverse needs of different household groups and facilitate the transition to net zero.

Participation and role of government and other actors to support attainment of 2030 fuel poverty target

Lastly, this report evidences the roles of key actors to support attainment of the 2030 fuel poverty target, and the required collaboration amongst these actors (national, local, community, trusted intermediaries and the innovation sector). National government plays a crucial role in setting clear policies, providing adequate funding, and coordinating efforts across departments to align with broader objectives such as net zero, health, employment, and skills. Regionally and locally, area-based delivery approaches tailored to local needs are supported, with local government coordinating efforts, establishing regional hubs, and leveraging independent advice services to provide personalized support and guidance throughout the customer journey. Additionally, actors involved in retrofit technological innovations can simplify existing technologies and explore alternative commercial approaches to further address fuel poverty.

Recommendations

Recommendation 1: The intricacies of policy design should not result in undue complexity across the customer journey for fuel poor households.

The research findings suggest a thorough review of existing policies is needed to streamline and simplify scheme design. This could ensure that schemes are accessible and comprehensible for fuel poor households and would entail revisiting the intricacies that contribute to confusion or barriers along the customer journey. By simplifying scheme design, fuel poor households can be empowered to navigate the process more effectively, facilitating greater participation and uptake of energy efficiency measures. Part of that simplification would be to maximise the use of data assets and emphasize the role of local actors.

Recommendation 1.1. Use cross-sector and cross-department data for more efficient targeting of fuel poor households and to learn from existing programmes.

The research indicates that broader implementation and an increase in the use of existing cross-departmental (DWP, DLUHC, DESNZ, DHSC, VOA) strategic data sharing agreements and wider data assets would enable better identification and targeting of fuel poor households. This could also be facilitated by removing barriers to data sharing, such as: local authority use of council tax data for MEEES enforcement; clarification on use of patient data by NHS staff to implement NICE guideline NG6; making links between existing Priority Service Registers or vulnerability registers. Some elements of data sharing are already implemented but these tend to be at a local level.

By leveraging better data and removing barriers to data sharing, energy efficiency schemes and advice support can be targeted more efficiently, thus facilitating a smoother customer journey towards alleviating fuel poverty and advancing the transition to net zero.

Recommendation 1.2. Recognise the role of local authorities and provide the necessary support for targeting fuel poor households and ensure participation across schemes.

The research findings highlight that local authorities play an important role in addressing fuel poverty, and facilitate the participation of fuel poor households across schemes. The findings from the different research strands suggested the need to mandate and empower local authorities to address fuel poverty via cross-department and cross-sector strategies, action plans and collaboration. The suggestion was extended to the provision of area-based support, allowing for regional variation in eligibility based on local need (e.g. income, personal and household circumstances), and the provision of necessary resources to undertake energy efficiency action.

Overall, promoting the development of local delivery partnerships (local authorities, other service providers, the third sector, businesses) to enhance the identification of fuel poor households and targeting of interventions provides a tailored approach to engagement and facilitation.

Recommendation 2. Provide end-to-end advice and support, which consider the associated costs of participating in energy efficiency schemes.

The findings highlight the requirement to provide wraparound ongoing support for fuel poor households to avoid dropouts from schemes, ensuring that fuel poor households receive the assistance they need throughout their journey. A one stop/single entry approach could provide seamless support and advice for the customer journey and promote wider net zero activities.

This support should extend to providing cover for associated and hidden costs around energy efficiency or retrofit installations (e.g. loft clearance) as part of energy efficiency schemes, as well as ensuring appropriate consumer protections and redress for fuel poor households are in place, to encourage take-up and avoid drop outs.

Recommendation 3: Targeted and specific action for the private rented sector.

It was suggested by research participants, and in the literature, that an increase to MEES requirements is required. For instance, to the preferred policy scenario given in the 2020 MEES consultation¹⁰⁹ or at least to align it with the requirements across social housing. This would accelerate energy efficiency improvements and reduce fuel poverty.

It was also highlighted that implementation of a National Landlord Register would drive energy efficiency improvements in the PRS and make MEES enforcement easier. It could also offer an opportunity to link this with PRS data for more efficient targeting and risk management. These changes will also require cross-government efforts to mitigate retaliatory action or undue rent

¹⁰⁹ The preferred policy scenario was requiring new tenancies to reach an energy efficiency rating in Band C from 1 April 2025 and all tenancies to reach a C-Band rating by 1 April 2028. Given in Department of Business, Energy and Industrial Strategy (2020) *Improving the Energy Performance of Privately Rented Homes in England and Wales*. Available at: <https://assets.publishing.service.gov.uk/media/5fdcc67fe90e07452fce4e12/prs-consultation-2020.pdf>

increases resulting from undertaking energy efficiency improvements. The findings from the research also indicate the need for a broader set of financial options for owner occupier or private landlords, for instance zero interest net zero loans or tax incentives.

Recommendation 4: Harness and empower trusted intermediaries and independent advice providers to support clarity around information.

The research highlights the importance of trusted intermediaries and independent advice providers to share and disseminate information. It suggests that the continuation and provision of proportionate investment in local advice organisations with geographic coverage across England is required to ensure that all fuel poor households can access support from trusted intermediaries. This support should also consider enhancing the offer, for instance to include multi-language material.

Findings from our research indicate that there is a low public understanding of net zero, fragmented energy advice services in England, misinformation and lack of fuel poor households' understanding of retrofit options. Thus, suggesting the need for a national centrally led public information campaign to convey the benefits of net zero and retrofit, challenge misinformation, indicate the support available to overcome fuel poverty, signpost to trusted advice sources, and make households aware of PAS requirements and consumer protections.

This study highlights the role of trusted intermediary that the energy efficiency supply chain has. Introducing further diversity into the workforce and bespoke training on dealing with vulnerable and fuel poor households could provide better support for fuel poor households, increasing consumer satisfaction and promoting further take-up.

Recommendation 5: Enhanced monitoring and evaluation to better understand progress towards reducing fuel poverty as part of scheme delivery and better understand take-up and dropouts across the customer journey.

There is the need to implement consistent and systematic monitoring of refusals and dropouts, to identify areas for improvement and to optimise scheme delivery across the different customer journey stages.

Research findings establish that a consistent and robust approach to measure and evaluate the impact on fuel poverty alleviation resulting from energy efficiency schemes is needed. This includes the correlation of wider outcomes such as thermal comfort and health with fuel poverty households to have a better understanding of scheme impact.

Introduce monitoring strategies to better understand if technologies and measures installed are being used correctly and households have successfully adapted to the new home, enabling the identification of faulty installations and reducing the socio-technoeconomic gap which may prevent fuel poor households from maximising the benefits obtained from energy efficiency measures.

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Annex 2 Summary of energy efficiency schemes

The table summarises energy efficiency schemes delivered in England since 2012. Insulation measures broadly include roof, underfloor, loft, cavity wall, and solid wall insulation.

AA = Attendance Allowance

DLA = Disability Living Allowance

PIP = Personal Independence Payment

OO = Owner Occupier

PRS = Private Rental Sector

ASHP = Air Source Heat Pump

GSHP = Ground Source Heat Pump

Name of the scheme	Years	Brief description	Tenure	Eligibility criteria (other than tenure) that participants must meet
Energy Company Obligation (ECO)4	2022-2026	<p>Largest GB energy efficiency scheme. Aims at upgrading homes of low-income families living in the least efficient properties.</p> <p>Boiler upgrade, repair, or replacement with renewable heating. Heating controls. New central heating. Electric Storage Heater upgrade or repair. Solar Panels</p> <p>Insulation measures including wall, loft, roof, floor, and park home insulation. Energy efficient glazing, external doors, draught proofing.</p> <p>Local authorities can tailor ECO4 eligibility criteria via ECO Flex for their areas using a statement of intent.</p>	All	Means-tested benefits (specified). No longer access if in receipt of disability benefits (AA, DLA, PIP) or via one of the scheme's four ECO Flex eligibility routes (through local authority). All properties must be equivalent to EPC Band D to G (E to G for private rental) to be eligible.
Great British Insulation Scheme (formerly ECO+)	2023-2026	<p>Delivers single insulation measure retrofits, primarily cavity wall and loft insulation to GB households. Low-income owner-occupied properties can also receive heating controls as a secondary measure. 20% of the scheme ringfenced to low-income households with the same criteria as ECO4.</p>	All	<p>Low-income households take the same eligibility criteria as ECO4. Also supports homes in Council Tax Band A-D in England and A-E in Scotland and Wales. Like ECO4, homes also eligible via ECO Flex.</p> <p>As well as the above, all homes must be equivalent to EPC Band D, E, F or G.</p>

<p>Social Housing Decarbonisation Fund (SHDF)</p>	<p>2021-2030</p>	<p>SHDF investment aims to support social housing landlords safely improve the energy performance of their properties through the installation of energy efficiency measures and low carbon technologies.</p> <p>A phased or waved approach has been taken on the SHDF in order that each wave can respond to lessons learnt and adapt to the political and economic context of the time.</p> <p>An initial pilot (the SHDF Demonstrator) was launched in 2020 to test innovative approaches to retrofitting at scale and generate valuable learnings for the sector. Alleviation of fuel poverty was not a primary objective.</p> <p>Since then, SHDF Waves 1, 2.1 and 2.2 have allocated £1bn of funding to treat over 100,000 homes. The focus of these programmes has been the alleviation of fuel poverty and the reduction of carbon emissions. Any measure eligible with SAP (Standard Assessment Procedure) excluding fossil fuel heating. Insulation, heating controls, low carbon heating, water efficiency devices and systems, solar panels.</p>	<p>Social housing (Local authority or private Registered Housing Providers)</p>	<p>On or off-gas properties. No income-related eligibility for tenants.</p>
<p>Green Homes Grant Local Authority Delivery scheme (LAD)</p>	<p>2020-2023</p>	<p>Aimed to improve the energy efficiency of low-income and low EPC rated homes (Bands D-G). Included off-gas grid homes. Competitive tender,</p>	<p>PRS and OO</p>	<p>On-gas. Combined household income of £30,000 or less.</p>

		<p>delivered by local authorities (individual or consortia).</p> <p>Retrofit assessment; whole house approach.</p> <p>Insulation measures including park homes.</p> <p>Low carbon heating – ASHP, GSHP, solar thermal water heating and electric storage heaters.</p> <p>Solar PV.</p>		EPC Band D to G.
Home Upgrade Grant (HUG)	2022-2025	<p>Aims to improve the energy performance of low-income off-gas properties, EPC rated D-G in England.</p> <p>Energy efficiency measures, such as wall insulation, loft insulation, solar PV, low energy lighting, and draught proofing.</p> <p>Low carbon heat measures such as ASHPs and high retention storage heaters.</p>	OO and PRS	<p>Off-gas.</p> <p>EPC Band D to G.</p> <p>Three eligibility routes: i) Gross household income of £36,000 a year or less (updated from April 2024 onwards scheme), ii) Means tested benefits, iii) IMD income deciles 1-3 (from April 2023 onwards).</p>
Green Homes Grant Voucher Scheme	2020-2021	<p>Aimed to fund energy improvements for all tenures. If primary measure installed, voucher could be used towards secondary measure. Voucher valid for three months.</p> <p>Primary measures (1 required): insulation, low carbon heating.</p>	All – tenants could apply on behalf of the landlord	Voucher worth up to two-thirds of the cost of selected energy efficiency improvements and low-carbon heating, with a maximum government contribution of £5,000. For households in receipt of certain benefits, up to £10,000 with potential for 100% payment for measures.

		Secondary measures: doors, energy efficient glazing, draught proofing, heating controls.		
Boiler Upgrade Scheme	2022-2028	Part funds cost of replacing fossil fuel heating system with a heat pump or biomass boiler. Not targeted at fuel poor. ASHP, GSHP, and biomass boilers in domestic and non-domestic buildings (when replacing fossil fuel or direct electric systems). Grant levels are £7,500 towards heat pump and £5,000 towards a biomass boiler.	PRS (landlords) and OO	Need a valid EPC with no recommendations for loft or cavity wall insulation. ¹¹⁰ New build not eligible, except for self-build properties. Biomass boilers are only supported in rural areas where the system is not mains gas.
Domestic Renewable Heat Incentive (RHI)	2014-2022	Encouraged renewable heat installations by paying for renewable heat generated from: heat pumps, solar thermal, biomass. Not targeted at fuel poor.	All	New homes not eligible (unless self-build).

¹¹⁰ This eligibility requirement is being amended. Properties with recommendations on their EPC will be eligible to apply.

Annex 3 Customer journeys

Customer journeys for the private rental sector, social housing and owner occupiers depict the barriers and enabling factors for each stage of the customer journey. The theme for each barrier and enabling factor (e.g. financial) is indicated with a pink capital letter. Dark shading identifies the barriers and enabling factors specific to each tenure, whilst light shading is applicable to all tenures.

Motivation to cut carbon and energy bills. **A**

Knowledge of long-term benefits of energy efficiency (bills, property value, comfort). **K**

Awareness of schemes via local authorities or media channels including social media, engagement with community groups. **K**

Knowledge of retrofit measures through trusted social connections (neighbours, friends and family). **K**

Accessible, clear, simple messaging. **K**

Previous positive experience with energy efficiency schemes or installation. **K**

Hearing others' experiences (e.g. at open homes events) provides reassurance and combats misinformation. **K**

Tenant is aware that there will be no impact to their tenancy agreement or rent costs related to scheme funded improvements. **R**

MEES have served as a tool to encourage landlords to apply. **R**

Financial incentives for landlords for energy efficiency improvements. **F**

Improvements may increase capital value of property, or reduce property maintenance cost and hassle, directly benefitting landlords. **F**

Landlord recognises the benefit from improved tenant relations and better reputation as a service provider. **A**

Targeted engagement of eligible households using relevant and up-to-date data. **O**

Energy supplier uses customer data (vulnerability, billing, smart meter) to reach those most in need. **O**

Energy efficiency improvements that can address other issues e.g. health conditions, mould or damp issues. **P**

Familiarity with scheme through word of mouth, local groups or energy advice provides reassurance and combats misinformation. **K**

Clear communications without jargon or assumption of any prior knowledge. **K**

Broad range of measures available across different schemes to meet the needs of more properties. **R**

Scheme is flexible to accommodate different homes and occupant needs or requirements. **O**

Broad, clear, simple eligibility criteria; creating greater pool of potential properties for retrofit. **R**

Support from local authorities / advice services to complete eligibility checks. **O**

Financial support through schemes; flexible finance options. **F**

Ensuring a good understanding from assessment of the most appropriate measures to install, and implications (e.g. ventilation). **K**

Tailored action plan including schedule and preparatory or remedial works. **K**

Good communication between parties ensures clear understanding of next steps. **K**

Single point of contact for on-going communication provides clarity and reassurance, helping to address any issues. **O**

Support is available for pre-installation activities like loft clearance. **B**

Installation reflects the initial plans and there is a smooth delivery of the installation. **K**

No additional or hidden costs to installations. **O**

Materials and installers are available when needed, without delays. **R**

Household receives clear explanation of how to use the newly installed measures. **K**

Tariff and energy advice is provided to optimise benefits from installed measures. **K**

Clear communication channels for queries via a single point (e.g. energy supplier) **K**

Clear complaints and escalation process via a single point of contact (e.g. energy supplier) **O**

Consumer protections are provided e.g. warranties. **R**

Monitoring of measures installed to assure performance and reduce risk of things going wrong. **O**

0
Pre-engagement knowledge and awareness
The customer's base knowledge, preconceptions and willingness prior to any engagement activity.

1
Initial engagement
Where a customer finds out about the scheme, e.g. through marketing by government, installers or local authorities. The household may be proactively looking for energy efficiency schemes.

2
Household eligibility and building suitability
Where a customer finds out if they're eligible for a scheme and if their home is suitable.

3
Procurement and planning
Where the installer is involved, planning the measures and the approach for the installation.

4
Whole-house retrofit or installation of measures
Where the delivery of the installation of measures occurs

5
Post-installation information and advice
The weeks or months after installation. The customer should be briefed on how to use the new measures and checks made to ensure its impact.

Lack of interest in net zero actions. **A**

Tenant doesn't feel responsible for housing decarbonisation. **A**

Tenant and/or landlord views energy efficiency as low priority. Short-term perspective amplified by cost of living crisis. **A**

Scepticism around benefits of insulation measures or low carbon technologies. **A**

Misinformation on social media or other channels. **K**

Negative personal experience or third-party accounts of energy efficiency schemes. **K**

Landlord frustration due to incompatibility of building upgrade plans or budget with schemes due to lack of continuity or long-term funding. **R**

Patchy availability of regional or local energy advice limits awareness of measures and schemes. **K**

Confusion caused by changes in retrofit advice over time e.g. insulation requirements with heat pumps. **K**

Outdated tenancy agreement limits tenant ability to install smart meters and engage with net zero by accessing a wider range of energy options e.g. smart tariffs, demand flexibility service. **A**

Lack of awareness about schemes and measures or new technology. **K**

Limited resource within local authorities to enforce MEES removes a driver for landlord engagement and improved energy efficiency. **R**

Lack of a national or local authority area-wide landlord licensing scheme limits promotion of and knowledge about MEES in the PRS, identification of private rented properties and enforcement of MEES in order to drive improvements in energy efficiency standards. **R**

Local authority enforcement team not aware of energy efficiency schemes which may limit landlord awareness. **O**

Local authorities inadequately resourced for targeted engagement. **R**

Lack of time for tenant and/or landlord to engage with schemes and understand eligibility, as PRS criteria differs across schemes. **P**

Costs are prohibitive if contribution is required, or additional costs associated with the installation such as redecoration. **K**

Landlord will not make financial contribution due to lack of, or split, incentive. **F**

Lack of trust or confidence in schemes, suppliers and installers. **A**

Scheme's short timescales and deadlines off-putting. These create a sense of urgency which is considered a blocker for uptake. **R**

Transience - fuel poor households moving house regularly makes it hard to engage. **P**

Lack of trust in landlord prevents tenants engaging. **A**

Vulnerable householder may be reluctant to accept works due to disruption. **P**

Lack of understanding (by installers, retrofit staff) of households' needs e.g. health, stress, lack of time. **K**

Communication and language barriers limit engagement. **K**

Lack of a clear, trusted intermediary to offer impartial advice and support. **K**

Schemes may not be available in all areas due to lack of capacity, funding or expertise. **R**

Lack of clarity around eligibility criteria across different schemes. **K**

Different EPC band criteria for private rented vs owner occupier (ECO) restricts eligibility in the PRS. **B**

Narrow eligibility criteria miss out people who need support e.g. people who do not claim pension credit though eligible. **R**

Householder reluctance to share personal information to the landlord means eligibility can't be evidenced. **A**

Financial contribution required by landlord (HUG). **F**

Tenant does not pursue measures due to fear of rent increase or eviction. **F**

Home is not suitable for specified works e.g. not enough space available. **B**

Landlord or tenant has limited awareness of building condition and how the home functions. **B**

All tenants within a building must agree to get certain measures. **O**

Pre-work required e.g. asbestos removal or repairs. **B**

Planning restrictions prevent uptake of measures, particularly in listed buildings and conservation areas. **R**

Practical and technological restrictions, such as the location of a heat pump (proximity to neighbours). **O**

Works to a single property less commercially suitable or viable for installer. **C**

Lack of choice of measures due to scheme restrictions. **R**

Additional coordination needed for planning due to involvement of landlord and tenant. **O**

Household or landlord may not want certain changes e.g. ventilation. **A**

Potential disruption is viewed negatively particularly for vulnerable householders if their needs are not being considered. **P**

Hidden or additional costs of installation that fall outside scheme support prohibit engagement. **F**

Certified installers not interested as improvement is not commercially viable. **C**

Supply chain issues cause delays (lack of installers, retrofit professionals, materials). Long lead times for getting works done. **C**

Lack of diversity in retrofit does not support trust and communication between households and supply chain. **A**

Retrofit professionals may not be trained in engagement with vulnerable customers. **K**

Batch process of scheme approvals means all installations can be refused over single issue. **R**

Disruption levels too high. **O**

Whole house retrofit cannot progress if tenant can't temporarily move out (e.g. due to health issues). **O**

Installation often happens during the week when householder may be at work, therefore it may require them to take time off work (potentially losing out on income). **O**

Installer faced with access issues to the property (tenant or landlord may refuse access; parking and access may be limited for flats). **O**

Large number of people involved in retrofit assessment and installation causes confusion and personal safety concerns. **O**

Installation gets delayed or takes longer than expected. **O**

Poor handover leads to misunderstanding or confusion about use of new measures, and risk of higher energy bills. **K**

No handover or guidance for new tenants moving into retrofitted properties. **O**

Lack of clear escalation channel, advice and support if things go wrong. **O**

Ongoing maintenance costs of low carbon technologies are passed on to the landlord (such as solar panel cleaning). No funding available for post-work remedial work (repairs or redecoration). **F**

Danger that heat pump will be switched off if householder is unconfident in use or running costs are expensive. **A**

Digitally excluded may not receive all benefits e.g. monitoring or controls using an app. **P**

KEY

Themes	F Financial	O Operations
	K Knowledge, information & communication	C Commercial & supply chain
	R Regulation & policy	A Attitudes & behaviours
	B Buildings	P Personal & household

Cell shading

Schemes may not be available in all areas due to lack of capacity, funding or expertise. R	Lighter cells are enablers or barriers that apply to all housing types.
Lack of clarity around eligibility criteria across different schemes. K	Darker cells are enablers or barriers that apply to just the private rented sector.

Motivation to cut carbon and energy bills. **A**

Knowledge of long-term benefits of energy efficiency (bills, property value, comfort). **K**

Awareness of schemes via local authorities or media channels including social media, engagement with community groups. **K**

Knowledge of retrofit measures through trusted social connections (neighbours, friends and family). **K**

Accessible, clear, simple messaging. **K**

Previous positive experience with energy efficiency schemes or installation. **K**

Hearing others' experiences (e.g. at open homes events) provides reassurance and combats misinformation. **K**

Targeted engagement of eligible households using relevant and up-to date data. **O**

Energy supplier uses customer data (vulnerability, billing, smart meter) to reach those most in need. **O**

Energy efficiency improvements that can address other issues e.g. health conditions, mould or damp issues. **P**

Tenant engagement happens early on in the process. **K**

Clear communications without jargon or assumption of any prior knowledge. **K**

Broad range of measures available across different schemes to meet the needs of more properties. **R**

Scheme is flexible to accommodate different homes and occupant needs or requirements. **O**

Broad, clear, simple eligibility criteria; creating greater pool of potential properties for retrofit. **R**

Accurate housing stock data is available. **B**

Housing providers can assess suitability of measures in multiple properties. **O**

Financial support through schemes; flexible finance options. **F**

Ensuring a good understanding from assessment of the most appropriate measures to install, and implications (e.g. ventilation). **K**

Installing measures in multiple properties can lead to economies of scale, and streamlined installs. **F**

Tailored action plan including schedule and preparatory or remedial works. **K**

Good communication between parties ensures clear understanding of next steps. **K**

Tenant liaison officer provides a single point of contact as a trusted intermediary. **O**

Single point of contact such as a retrofit coordinator for on-going communication provides clarity and reassurance, helping to address any issues. **O**

Support is available for pre-installation activities like loft clearance. **B**

Delivery is more straightforward in unoccupied properties, housing provider may be able to facilitate this. **O**

Installation reflects the initial plans and there is a smooth delivery of the installation. **K**

No additional or hidden costs to installations. **O**

Materials and installers are available when needed, without delays. **R**

Household receives clear explanation of how to use the newly installed measures. **K**

Tariff and energy advice is provided to optimise benefits from installed measures. **K**

Ongoing support available through housing provider. **O**

Clear communication channels for queries via a single point of contact (e.g. landlord). **K**

Clear complaints and escalation process via a single point of contact (e.g. landlord). **O**

Consumer protections are provided e.g. warranties. **R**

Monitoring of measures installed to assure performance and reduce risk of things going wrong. **O**

0
Pre-engagement knowledge and awareness
The customer's base knowledge, preconceptions and willingness prior to any engagement activity.

1
Initial engagement
Where a customer finds out about the scheme, e.g. through marketing by government, installers or local authorities. The household may be proactively looking for energy efficiency schemes.

2
Household eligibility and building suitability
Where a customer finds out if they're eligible for a scheme and if their home is suitable.

3
Procurement and planning
Where the installer is involved, planning the measures and the approach for the installation.

4
Whole-house retrofit or installation of measures
Where the delivery of the installation of measures occurs

5
Post-installation information and advice
The weeks or months after installation. The customer should be briefed on how to use the new measures and checks made to ensure its impact.

Lack of interest in net zero actions. **K**

Tenant doesn't feel responsible for housing decarbonisation as this is their landlords responsibility. **K**

Scepticism around benefits of insulation measures or low carbon technologies. **K**

Misinformation on social media or other channels. **K**

Landlord frustration due to incompatibility of housing upgrade plans or budget with schemes due to lack of continuity or long-term funding. **K**

Negative personal experience or third-party accounts of energy efficiency schemes. **K**

Patchy availability of regional or local energy advice limits awareness of measures and schemes. **K**

Housing provider money and debt advice services are under-resourced which limits retrofit referrals. **K**

Confusion caused by changes in retrofit advice over time e.g. insulation requirements with heat pumps. **K**

Lack of awareness about schemes and measures or new technology. **K**

Local authorities inadequately resourced for targeted engagement. **R**

Tenant refusal or disengagement (resistant to change, avoid disruption, home is 'good enough'). **A**

Costs are prohibitive if contribution is required, or additional costs associated with the installation such as redecoration. **K**

Scheme's timescales do not align with planned works. **O**

Lack of trust or confidence in schemes, suppliers and installers. **A**

Scheme's short timescales and deadlines off-putting. These create a sense of urgency which is considered a blocker for uptake. **R**

Vulnerable householder may be reluctant to accept works due to disruption. **P**

Lack of understanding (by installers, retrofit staff) of households' needs e.g. health, stress, lack of time. **K**

Communication and language barriers limit engagement. **K**

Leaseholder consultation and negotiation in mixed tenure housing causes retrofit delays which impacts tenants. **F**

Schemes may not be available in all areas due to lack of capacity, funding or expertise. **R**

Housing stock data is variable in quality. Time and expertise needed to check it. **B**

Home is not suitable for specified works e.g. not enough space available. **B**

Building adaptations made by tenants must be assessed by provider. Potential pre-installation work can prevent or delay retrofit. **B**

Pre-work required e.g. asbestos removal or repairs. **R**

Planning restrictions prevent uptake of measures, particularly in listed buildings and conservation areas. **O**

Practical and technological restrictions, such as the location of a heat pump (proximity to neighbours). **B**

Lack of choice of measures due to scheme restrictions. **R**

Household or landlord may not want certain changes e.g. ventilation. **A**

Potential disruption is viewed negatively particularly for vulnerable householders if their needs are not being considered. **P**

Point of contact for tenants between housing provider and installer may be unclear. **K**

Hidden/additional costs of installation that fall outside the scheme support will prohibit engagement. **F**

Certified installers not interested as improvement is not commercially viable. **C**

Supply chain issues cause delays (lack of installers, retrofit professionals, materials). Long lead times for getting works done. **C**

Lack of diversity in retrofit does not support trust and communication between households and supply chain. **A**

Retrofit professionals may not be trained in engagement with vulnerable customers. **K**

Batch process of scheme approvals means all installations can be refused over single issue. **R**

Economies of scale (street or block installations) prevented due to small differences between adjacent properties. **R**

Disruption levels too high. **O**

Large number of people involved in retrofit assessment and installation causes confusion and safety concerns. **O**

Installation gets delayed or takes longer than expected. **O**

Poor handover leads to misunderstanding or confusion about use of new measures, and risk of higher energy bills. **K**

No handover or guidance for new tenants moving into retrofitted properties. **O**

Ongoing maintenance costs of low carbon technologies are passed on to the housing provider (such as solar panel cleaning). No funding available for post-work remedial work (repairs or redecoration). **F**

Danger that heat pump will be switched off if householder is unconfident in use or running costs are expensive. **A**

Digitally excluded may not receive all benefits e.g. monitoring or controls using an app. **P**

KEY

Themes	F Financial	O Operations
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Cell shading

Schemes may not be available in all areas due to lack of capacity, funding or expertise. R	Lighter cells are enablers or barriers that apply to all housing types.
Lack of clarity around eligibility criteria across different schemes. K	Darker cells are enablers or barriers that apply to just social housing.

Motivation to cut carbon and energy bills. **A**

Knowledge of long-term benefits of energy efficiency (bills, property value, comfort). **K**

Awareness of schemes via local authorities or media channels including social media, engagement with community groups. **K**

Knowledge of retrofit measures through trusted social connections (neighbours, friends and family). **K**

Accessible, clear, simple messaging. **K**

Previous positive experience with energy efficiency schemes or installation. **K**

Hearing others' experiences (e.g. at open homes events) provides reassurance and combats misinformation. **K**

Encouragement to make small DIY improvements like draught proofing or radiator reflector panels, normalising energy efficiency measures. **K**

Incentive to increase value of home. **F**

Financial mechanisms e.g. zero interest loans, flexible repayment terms. **F**

Other renovations being undertaken act as trigger for further work. **B**

Targeted engagement of eligible households using relevant and up-to date data. **O**

Energy supplier uses customer data (vulnerability, billing, smart meter) to reach those most in need. **O**

Energy efficiency improvements that can address other issues e.g. health conditions, mould or damp issues. **P**

Familiarity with scheme through word of mouth, local groups or energy advice may provide reassurance and combat misinformation. **K**

Clear communications without jargon or assumption of any prior knowledge. **K**

Broad range of measures available across different schemes to meet the needs of more properties. **R**

Scheme is flexible to accommodate different homes and occupant needs or requirements. **O**

Broad, clear, simple eligibility criteria; creating greater pool of potential properties for retrofit. **R**

Support from local authorities or advice services to complete eligibility checks. **O**

Financial support through schemes; flexible finance options. **F**

Ensuring a good understanding from assessment of the most appropriate measures to install, and implications (e.g. ventilation). **K**

Tailored action plan including schedule and preparatory or remedial works. **K**

Good communication between parties ensures clear understanding of next steps. **K**

Single point of contact for on-going communication provides clarity and reassurance, helping to address any issues. **O**

Support is available for pre-installation activities like loft clearance. **B**

Installation reflects the initial plans and there is a smooth delivery of the installation. **K**

No additional or hidden costs to installations. **O**

Materials and installers are available when needed, without delays. **R**

Household receives clear explanation of how to use the newly installed measures. **K**

Tariff and energy advice is provided to optimise benefits from installed measures. **K**

Clear communication channels for queries via a single point of contact (e.g. energy supplier) **K**

Clear complaints and escalation process via a single point of contact (e.g. energy supplier) **O**

Consumer protections are provided e.g. warranties. **R**

Monitoring of measures installed to assure performance and reduce risk of things going wrong. **O**

0
Pre-engagement knowledge and awareness
The customer's base knowledge, preconceptions and willingness prior to any engagement activity.

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Initial engagement
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2
Household eligibility and building suitability
Where a customer finds out if they're eligible for a scheme and if their home is suitable.

3
Procurement and planning
Where the installer is involved, planning the measures and the approach for the installation.

4
Whole-house retrofit or installation of measures
Where the delivery of the installation of measures occurs

5
Post-installation information and advice
The weeks or months after installation. The customer should be briefed on how to use the new measures and checks made to ensure its impact.

Lack of interest in net zero actions. **A**

Happy with existing housing condition, no need for change. **A**

Energy efficiency is low priority. Short-term perspective amplified by cost of living crisis. **A**

Scepticism around benefits of insulation measures or low carbon technologies. **A**

Low 'energy literacy' - inability to assess costs and benefits of energy efficiency measures. **K**

Misinformation on social media or other channels. **K**

Negative personal experience or third-party accounts of energy efficiency schemes. **K**

Frustration due to incompatibility of home upgrade plans or budget with schemes due to lack of continuity or long-term funding. **R**

A confusing scheme landscape with many actors, schemes and different levels of support. **K**

Patchy availability of regional or local energy advice limits awareness of measures and schemes. **K**

Confusion caused by changes in retrofit advice over time e.g. insulation requirements with heat pumps. **K**

Preference for visible measures (solar PV, doors, windows) over non-visible ones (insulation). **A**

Local authorities inadequately resourced for targeted engagement. **K**

Lack of time to engage with schemes and understand eligibility. **R**

Costs are prohibitive if contribution is required, or additional costs associated with the installation such as redecoration. **P**

Owner occupiers may be 'asset rich cash poor', lacking capital for investment. **K**

Lack of trust or confidence in schemes, suppliers and installers. **F**

Scheme's short timescales and deadlines off-putting. These create a sense of urgency which is considered a blocker for uptake. **A**

Vulnerable householder may be reluctant to accept works due to disruption. **R**

Lack of understanding (by installers, retrofit staff) of households' needs e.g. health, stress, lack of time. **P**

Communication and language barriers limit engagement. **K**

Lack of a clear, trusted intermediary to offer impartial advice and support. **K**

Cost to leaseholders may be prohibitive. **F**

Schemes may not be available in all areas due to lack of capacity, funding or expertise. **R**

Lack of clarity around eligibility criteria across different schemes. **K**

Narrow eligibility criteria miss out people who need support e.g. people who do not claim pension credit though eligible. **R**

Householder reluctance to share personal information means eligibility can't be evidenced. **A**

Home is not suitable for specified works e.g. not enough space available. **B**

Pre-work required e.g. asbestos removal or repairs. **B**

Planning restrictions prevent uptake of measures, particularly in listed buildings and conservation areas. **R**

Practical and technological restrictions, such as the location of a heat pump (proximity to neighbours). **O**

Works to a single property less commercially suitable or viable for installer. **C**

Lack of choice of measures due to scheme restrictions. **R**

Household may not want certain changes e.g. ventilation. **A**

Potential disruption is viewed negatively particularly for vulnerable householders if their needs are not being considered. **P**

Hidden or additional costs of installation that fall outside scheme support prohibit engagement. **F**

Certified installers not interested as improvement is not commercially viable. **C**

Supply chain issues cause delays (lack of installers, retrofit professionals, materials). Long lead times for getting works done. **C**

Lack of diversity in retrofit does not support trust and communication between households and supply chain. **A**

Retrofit professionals may not be trained in engagement with vulnerable customers. **K**

Batch process of scheme approvals means all installations can be refused over single issue. **R**

Disruption levels too high. **O**

Whole house retrofit can't progress if homeowner can't temporarily move out (e.g. due to health issues). **O**

Installation often happens during the week when householder may be at work, therefore it may require them to take time off work (potentially losing out on income). **O**

Large number of people involved in retrofit assessment and installation causes confusion and safety concerns. **O**

Installation gets delayed or takes longer than expected. **O**

Poor handover leads to misunderstanding or confusion about use of new measures, and risk of higher energy bills. **K**

Ongoing maintenance costs of low carbon technologies are passed on to the owner (such as solar panel cleaning). No funding available for post-work remedial work (repairs or redecoration). **F**

Lack of clear escalation, advice and support if things go wrong. **O**

Danger that heat pump will be switched off if householder is unconfident in use or running costs are expensive. **A**

Digitally excluded may not receive all benefits e.g. monitoring / controls using an app. **P**

KEY

- Themes**
- F** Financial
 - O** Operations
 - K** Knowledge, information & communication
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 - R** Regulation & policy
 - A** Attitudes & behaviours
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Cell shading

Schemes may not be available in all areas due to lack of capacity, funding or expertise. **R**

Lighter cells are enablers or barriers that apply to all housing types.

Lack of clarity around eligibility criteria across different schemes. **K**

Darker cells are enablers or barriers that apply to just owner occupiers.