Upgrade:

How to deliver better homes by 2030

The Home Upgrade Commission
July 2024

PUBLICFIRST

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Acknowledgments

We thank our Commissioners for supporting this research project. This report and its recommendations are the sole work of the authors, who maintained editorial control throughout the project. We also thank the many stakeholders that engaged with the research project and shared their views. Cover page image: Bruno Fernandez, Unsplash, accessed July 2024.

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Public First is a global strategic consultancy that works to help organisations better understand public opinion, analyse economic trends, and craft new policy proposals.

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Executive summary

Our homes make us ill, leave us vulnerable to volatile energy bills, and emit mega-tonnes of carbon into the atmosphere. The status quo cannot hold. Political pressure to address this issue is rising as households demand cheaper bills and a cleaner future. Meanwhile, key statutory targets around emissions and fuel poverty loom large.

The pace of current programmes to improve energy efficiency will leave families exposed until 2040. This report explains how the new government can transform that picture over the course of this parliament, building public trust and a robust delivery process so that a second-term Labour government can offer a comprehensive upgrade to Britain's homes and save us an extra decade of cold, unhealthy homes.

> The public think energy bills are the most important issue for homes and housing (72%), ahead of high rent/mortgages (65%) and insufficient housing for the population (45%).
>
> Of all the things the government can do to reduce UK emissions, the public think improving energy efficiency in buildings and homes is most effective (36%), a similar proportion to increasing the speed of building well-supported renewables like solar and wind (34%).

Labour's 2024 manifesto committed to spending an extra £6.6bn to upgrade 5 million homes - doubling the committed spend by the previous Conservative government to a total of £13.2bn - to cut bills, insulate homes and provide support for low-carbon heat, solar panels and batteries. The new Labour government is right to make homes a core feature of their governing mission. For too long, upgrading homes for energy-efficiency and clean heat has struggled to gain sustained political attention and funding. **Over the next five years, the government faces major political and policy challenges on several fronts. Managing these, and the trade-offs they entail, will define the UK's ability to deliver home upgrades in the decade ahead.**

This report outlines the challenges and decisions facing the new government, and sets out a politically relevant, feasible route for delivering a Home Upgrade Plan.

Critically, two statutory targets require more funding this parliament than is available, the fuel poverty target in England and the UK's fourth and fifth Carbon Budgets require additional capital spending over and above the Labour government's committed £13.2bn.

Public First analysis finds that meeting these targets through direct household schemes[1] running throughout the new parliament would require a fiscal envelope of £30.6bn this parliament. While this could upgrade 5 million homes over the next five years, it exceeds what has already been planned for these schemes (by the former Conservative government) and pledged (by the new Labour government) by £18.4bn. Put bluntly: even to meet statutory targets, **the government will need to find more money and reform existing schemes to ensure investment is spent in full.**

1 These include Social Housing Decarbonisation Fund, Local Authority Retrofit Scheme, Boiler Upgrade Scheme, and the Energy Efficiency Grant

The politics of this fiscal decision is amplified by practical and public opinion challenges. Public First research finds that there is limited overlap (17%) between households that are fuel poor and those with higher than average emissions. Also, the public are most likely to want 'everyone' to be eligible for financial support (43%) over fuel poor or low-income households (both 30%) and high-emitters (10%). **The government faces a difficult decision early on to set out how their initial funding pot will be allocated.**

Capacity to upgrade homes for energy-efficiency and clean heat is developing from a low-base. The supply chain currently lacks the skills capacity to deliver at scale either through local authorities, central government or the private sector. Key frameworks for planning and delivering upgrades are either not fit for purpose (for example, household EPCs) or have yet to be developed (for example, neighbourhood level interventions). Additionally, although consumers want more efficient homes, they do not feel equipped to take action due to a lack of information and financial incentives.

Getting a Home Upgrade Plan off the ground this parliament, with constrained funding, will require the pragmatism to build upon existing mechanisms and utilise public-private partnership. This includes developing capacity in local government alongside building on the successes of supplier-led delivery (through obligation schemes); working with banks to design attractive private finance alongside public-funded grants; and developing the policy, finance and procurement frameworks for 'street-by-street' delivery alongside decarbonising individual homes.

For the next five years, the government's focus must be on building capacity and demand to ramp up upgrade rates, paving the way for the next 25 years. The 'to do' list for this parliament includes:

- **Build public knowledge and trust** by strengthening consumer protections and using the role of government as a trusted communicator to advocate for the benefits of home upgrades.
    - The government should launch a National Home Upgrade Programme (NHUP) that brings together information campaigns, online tools, and funding schemes under one simple, household-facing, long-term mission. NHUP draws on clear, aspirational language that will stand the test of climate and time.

- **Increase public confidence** by improving consumer protection frameworks and introducing real performance measures so that households know how home upgrades will benefit them and can access redress if something goes wrong.
- **Set a clear roadmap for decarbonising heat and buildings** to instil confidence in the market, incentivise private investment, and enable plans for more efficient, scalable delivery models. This includes:

    - Bring forward the decision on hydrogen heating from 2026; upgrade minimum energy efficiency standards in the private rented sector; and implement the Statutory Instrument for the Clean Heat Market Mechanism for heat pump manufacturing.

    - Critically, policymakers must rebalance levies to reduce the cost of

electrified heat; establish a framework for clean-heat area-based approaches with a common methodology for local area energy plans; and update EPCs to incorporate real building performance and incentivise clean heat.

- **Improve the performance of existing schemes for households in need.** New guidance on local authority and supplier obligation schemes is required to reduce complexity and underspend, with over £415m returned to the Exchequer since 2020.
    - The government must ensure guidance for the new Local Authority Retrofit Scheme (LARS) includes increased cost caps in line with construction inflation; introduces a challenge model to reduce the feast-famine approach of competitive bidding; and enables consortia approaches to support greater devolution in future. Additionally, officials should consult quickly on removing the Minimum Requirement on EPC bands for ECO4 from April 2025.
    - Provide long-term certainty by committing to a 10-year funding settlement for the LARS and extend the supplier obligation until at least the end of the parliament with plans to combine obligations from 2026.
- **Pump-prime the market to unlock private finance** with publicly-funded grant schemes, attractive loan terms, and incentives to encourage uptake among 'able to pay' households.
    - This year, the government must set out Energy Efficiency Grant details for cost-effective insulation measures that will support a successful clean heat roll out.
    - The government must also work with high street lenders to develop attractive loan terms available from mid-way through the parliament, and explore innovative options such as Property-Linked Finance, on-bill financing and tax incentives.
- **Grow the home upgrade workforce** to reskill existing workers or attract new recruits.
    - The government must set the conditions for a thriving workforce. Use signalling power to change young people's perceptions of trade; ringfence funding to boost apprentices; and set a clear path for heat pump skills through mandatory installer accreditation.

Delivering a Home Upgrade Plan requires both near-term decisions and ongoing efforts throughout the parliament from multiple actors. This includes government departments (HMT , DESNZ, MHCLG, DfE, DWP), Ofgem, and wider delivery partners, such as obligation-paying suppliers, local government and the supply chain. To keep policy development on track across various government bodies and wider organisations, a formal coordination of delivery partners and advisors should be established and convened through quarterly meeting checkpoints. The meetings should be run by the Minister for Energy Consumers, with other relevant government departments, obligation-paying suppliers, funding delivery agents, statutory consumer bodies and the CCC in attendance.

This will be incremental work: building capacity within local authorities, upskilling the workforce and bringing the public onside are projects that take years not months. The temptation to overhaul the current system and start again must be resisted, as must the urge to concentrate on more exciting and faster-moving projects. If the government is committed and diligent in this parliament, its reward will be public legitimacy and an ecosystem ready to deliver at scale in 2029-34.

Early actions

To do list for 2024. For a timeline of actions for the whole parliament, see page 94.

Legislation Update secondary legislation for heat and buildings	• Update minimum energy efficiency standards for the private rented sector to be implemented from 2030. • Lay the Statutory Instrument for implementing the Clean Heat Market Mechanism by April 2025. • Lay the Statutory Instrument for the Future Homes Standard within Building Regulations for 2025. • Update permitted development rules to allow heat pumps installations within 1m of homes.
Policy development Set out plans for the future of heat and buildings	• Bring forward the decision on hydrogen for heating. • Launch the two-year delayed consultation on rebalancing electricity levies, aiming for a clear decision before mid-parliament. • Launch a one-year sprint on data-matching for targeted bill support and to reduce search costs to identify vulnerable households for retrofit. • Review unpublished 2021 consultation response on EPC reform with a decision to publish it or launch a short follow-up consultation on real performance metrics and clean heat incentives. • Consult on relaxing stringent ECO eligibility requirements which are hampering delivery, including removing Minimum Requirements from 2025. • Begin work on 'street-by-street' delivery strategy bringing together LAEPs with a standardised methodology and Regional System Planner.
Begin work to confirm details of new schemes launching in April 2025	• Confirm the Local Authority Retrofit Scheme (LARS) guidance including a challenge model, consortia-approaches, and uprated cost caps. • Confirm grant level and eligibility for the Energy Efficiency Grant (EEG). • Set out plans for promoting the EEG in line with early public information campaigns on the benefits of energy-efficiency upgrades, and using a single consumer-facing brand, such as the National Home Upgrade Programme. • Launch a review of the consumer protection framework to identify and mitigate consumer detriment risks as more funding schemes (e.g. EEG) become available.
Fiscal events Prepare for 2025/26 budget allocations	• Set out what progress will be made towards statutory targets of fuel poverty and carbon budgets this parliament, including whether any of the additional £6.6bn will be allocated in the upcoming budget. • Announce a 10-year funding settlement for the Local Authority Retrofit Scheme and a long-term settlement for combining and extending supplier obligations. • Confirm how the Growth and Skills Levy will replace the Apprenticeship Levy. Allocate ringfenced retrofit and clean heat apprenticeship funding for young people

Introduction

The UK needs to improve the efficiency of its homes - for the sake of those living in them and paying the energy bills, and for the country to reach its binding climate targets. Yet to date, little has been done.

Upgrading our homes can improve the health of the most vulnerable, reduce energy bills, cut emissions, and increase national energy security. But successive UK Governments have viewed intervening in *the home* as fraught with political risk. This nervousness has driven a litany of underwhelming policy and years of neglect as politicians searched for a single, easy or low-cost answer. It has come at the expense of gradual reforms that reduce risk and increase political benefits over time.

In this report, we rebalance the scales, exploring the actions that can be taken *now* to build the political economy and practical foundations required to ramp up delivery of home upgrades now, and drive even more for more ambitious home decarbonisation later.

The UK's unique challenge

Improving the quality of the UK's homes is one of the most significant infrastructure challenges that we face over the next two and a half decades. The state of our homes is harming those that live in them. Draughty, inefficient homes mean high energy bills and contribute to making around six million households fuel poor.[2] Cold and mould costs the NHS £2.5bn a year.[3] And our devotion to gas boilers drives volatile energy bills. Homes are responsible for 13% of the UK's greenhouse gas emissions in 2022.

Major economies across the world are also grappling with decarbonising their own stock but the UK's houses are far worse than in similar economies. The majority of our homes are carbon-intensive and draughty, with 23 million heated by a gas boiler and 16 million rated as poor efficiency (below EPC C). Our high dependency on gas for our heating, with 85% of homes connected to the gas grid, is double that of France (42%), whilst Denmark is mostly connected to district heating (65%).[4]

We have the oldest housing stock in Europe which means it is harder (and more costly) to improve efficiency. The technical challenge is immense, but it has been made harder, not easier, by politics.

The politics of home heating

Both the macro and micro politics have held back home decarbonisation. British politics has tended towards less state intervention compared to those countries improving their housing faster. Unwillingness to spend public money and a focus on quick wins has resulted in short-term funding cycles and delays compared to other

2 National Energy Action, *Energy Crisis*, January 2024

3 Institute of Health Equity, *Fuel poverty, cold homes and health inequalities in the UK*, June 2023

4 MCS Foundation, *Heat pump rollout in France and the UK*, June 2023 / Embassy of Denmark, *Evidence of Danish Decarbonisation,* November 2020

countries, like France, which have taken a longer-term approach to building both supply and demand.

At the micro level, Westminster's assumption and politicians' fear is that homes are political - this creates a nervousness about any policy that intervenes in people's private spaces. The high cost of retrofitting homes exacerbates this fear. Politicians have chosen to amplify this issue to create political dividing lines. This was the mantra of David Cameron's mid-first term pivot when he 'cut the green crap' in 2013, and is the sentiment behind Rishi Sunak's more recent opposition to 'environmental dogma'.

The new Labour government has, for now, chosen the other side of the dividing line - pledging action. In 2021 Labour (then in opposition) announced its Warm Homes Pledge, originally pledging to upgrade 19 million homes to EPC C with £60bn over 10 years. In February 2024, the Party backtracked. This was caused by both the macro-politics (Labour's electoral strategy meant they were wedded to fiscal restraint), and the micro: that Rishi Sunak's changes to home heating policy made their pledge more technically challenging.

The Labour government's 2024 manifesto in the end committed them **to improving 5 million homes (to EPC C) this parliament with an extra £6.6bn of public investment.** It is on this target that this report is focused.

The next five years will be the testbed for how British people interact with the net zero transition in their homes. The new Labour government will face the same difficult political choices faced by the Conservatives. The fiscal environment will remain challenging and it will take time for the benefits of action to be visible to all. But we cannot wait another five years to begin turning things around. As explored throughout this report, the shorter the timescales get, the harder the politics become. It is for this challenge that the Home Upgrade Commission was established. This report is structured as below:

- **Part One: Context** tackles the trade offs in policy choices that underpin the Home Upgrade Plan such as who benefits, how are they reached and by whom;
- **Part Two: Policy** identifies the 'quiet' policy wins that begin to tip the balance on political risk, and unpacks how those smaller initial choices build towards a broader platform of change for UK households. This includes:
    - Building knowledge and trust among the public (both consumers and workers)
    - Setting a clear roadmap for heat decarbonisation
    - Addressing underspend to make existing schemes work better for those in need
    - Priming the market to unlock private finance
    - Growing the home upgrade workforce
- **Part Three: Delivery** sets out the remit and timeline of a National Home Upgrade Service.

The Home Upgrade Commission

This report is the culmination of a nine month Commission run by Public First with

support from organisations in energy, heat and insulation technology, banking and consumer protections. The report reflects the authors' research and recommendations on how the new Labour government can implement a practically deliverable and politically feasible plan for upgrading the UK's housing stock over the next five years.

Recognising the need to keep our homes cool in a warming climate, we refer to a Home Upgrade Plan rather than the Warm Homes Plan. Our research finds that messages around home improvement and upgrade are aspirational and effective in building demand. This is reflected in initiatives abroad, such as France's MaPrimeRenov (My Great Renovation), and the loan marketing of Germany's KfW development bank.

The research included in this report draws on quantitative and qualitative methods including:

- Stakeholder engagement through 1:1 interviews; an online workshop of local authority representatives; and monthly Commissioner meetings;
- Data analysis and economic modelling;
- Eight focus groups (six with the general public, two with tradespeople) and a 4,000 sample poll.

Part One:

Context

Part One: Context

First, the new Labour government needs to answer key questions on the premise and rationale of a Home Upgrade Plan. Why is it needed? Who should benefit from it? And how does it reach those people? Part One of this report sets out the context that Labour have inherited, highlighting how competing statutory targets make it even harder to decide 'who benefits'; making the case for a public-private partnership for delivery; and discussing the extent to which delivering this plan should be done centrally or locally.

Key principles from Part One

The new government faces economic, technical and political trade-offs to upgrade 5 million homes.

- Two statutory targets this parliament - fuel poverty and carbon budgets - means that as a first priority, the new Labour government must set out how a Home Upgrade Plan will accelerate progress towards these and allocate funding.
- Public money must support fully-funded measures for those in most need (fuel poor, low-income and social renters) as well as part-funded for all household types to build the market for home upgrades and get on track for heat decarbonisation.
- Getting a Home Upgrade Plan off the ground this parliament, with constrained funding, will require pragmatism in building on existing mechanisms and utilising private-public partnership between local government, energy suppliers, and banks. Creating a new structure would be counterproductive, costly and slow.
- 'Street-by-street' approaches to delivery are the right aspiration - but we do not yet have the foundations to do this effectively. This parliament, the government must develop the right policy, finance and procurement frameworks to enable 'street-by-street', while continuing to develop the individual household market for energy-efficiency and clean heat.

1.1 Why do we need a Home Upgrade Plan?

The status quo of the UK's housing stock is unsustainable, both for people and for the environment. Our homes make millions of households sick and leave us vulnerable to volatile energy bills. They also emit mega-tonnes of carbon into the atmosphere. Resolving this issue requires insulating nearly 16 million homes and replacing 23 million gas boilers with a low-carbon alternative.

Political pressure to deliver on this ambition is rising as households demand cheaper bills and a cleaner future:

- The public see energy bills as the most important issue related to British homes and housing (72%), ahead of high rent/mortgages (65%) and insufficient housing for the population (45%).
- A quarter (23%) of the public say their home suffers from mould, mildew or damp, and cold - the joint-number one issue affecting their home above noise (11%), poor layout (11%), unappealing neighbourhood (10%) and unattractive aesthetic, from the outside (10%) and the inside (6%).
- Of all the things government can do to reduce UK emissions, the public think improving energy efficiency in buildings and homes is most effective (36%), a similar proportion to increasing the speed of building well-supported renewables like solar and wind (34%).

The history of energy efficiency policy amplifies the need for a new government to take action. Since 2012, governments have left a trail of failed energy-efficiency policies in their wake, most notably, The Green Deal (2012-2015), the never achieved Zero-Carbon Homes Standard (2015), and the scrapped Green Homes Grant (2020). As a result, energy efficiency installations plummeted over the 2010s. Progress was made but it was slow: Public First estimates that as many as 3.5 million existing homes reached EPC C over the last parliament. At this rate, it would take nearly four parliamentary terms to upgrade all homes to EPC C, meaning that some households would wait until 2041 to benefit. The new Labour Government cannot afford to wait to take meaningful action on energy efficiency. This is the context which pushed Labour to set a target of upgrading 5 million homes this parliament.

1.2 Target(s) on your back: Who benefits?

The central question for a Home Upgrade Plan is *which* 5 million homes should be upgraded to EPC C?

At some point over the next 25 years, the vast majority of UK homes will need to be upgraded for energy efficiency and low-carbon heat. However, with a total of £13.2bn pledged over the next five years - half of which has already been committed - and a manifesto commitment to upgrade 5 million households, the new government must prioritise. There are various ways in which a government could decide how to allocate funding based on which political win it values most. That might be:

- Improving the homes and lives of the most vulnerable i.e. those in fuel poverty;
- Reducing carbon emissions as swiftly as possible, or
- By reaching the highest number of homes i.e. the most cost-effective route.

Each option implies targeting different households with different technical solutions. Picking one of these objectives means trade offs on who benefits and by how much - this was recognised by Commissioners, stakeholders and the public. Ultimately, a policy programme should work towards ensuring a combination of social, environmental, and economic benefit. **This choice is further constrained by two key statutory targets within the next five years on fuel poverty and carbon abatement:**

- **Reducing fuel poverty:** *To ensure that as many fuel poor homes as is reasonably practicable achieve a minimum energy efficiency rating of Band C, by 2030* (England)[5]

- **Reducing carbon emissions:** The next parliament (2024-2029) spans two legally-binding carbon budget cycles for the UK set by the CCC: the Fourth Carbon Budget (2023-2027) and the Fifth Carbon Budget (2028-2032). While delivery projections under the CCC's Balanced Pathway do not relate to EPC bandings, its estimates suggest installing 6.4 million heat pumps and insulating 6 million cavity walls, 19.3 million lofts, and 7.2 million solid walls in the UK between 2025 and 2029.[6] As a result, DESNZ has a target to install 600,000 heat pumps a year by 2028.

As a first priority, the new Labour government must set out how a Home Upgrade Plan will make progress towards meeting these statutory targets.

Barriers to meeting statutory targets

There are practical, fiscal and political barriers to the government achieving these statutory targets, alongside the target to upgrade 5 million homes, in full.

Fiscal: The probable capital investment required for meeting either the fuel poverty or carbon statutory targets exceeds the government's pledged £13.2bn (of which £6.6bn was already planned by the last Conservative government). Meeting the 2030 fuel poverty target in England is estimated to require an additional £18bn of investment.[7] By comparison, carbon budgets would need around two and half times that over the parliament with £46bn for the UK (£40bn in England). Under the National Infrastructure Commission's approach, as much as two-thirds of this would need to come from the private sector, leaving the required public spending envelope still greater than what has been allocated at £15.3bn in the UK (£13.4bn in England). In reality, these costs could be even higher, as estimates were published in 2020 and investment between then and now has not kept up with the modelled requirements.[8]

5 Scotland's statutory fuel poverty target is that no more than 5% of households will be in fuel poverty by 2040. Wales and Northern Ireland do not have statutory fuel poverty targets.

6 CCC, *The Sixth Carbon Budget Dataset V2,* December 2020

7 NEA, *NEA UK Fuel Poverty Monitor,* January 2024 / CCC, *The Sixth Carbon Budget Dataset V2,* December 2020. CCC figures refer to period 2025-2029.

8 NEA, *NEA UK Fuel Poverty Monitor,* January 2024 / CCC, *The Sixth Carbon Budget Dataset V2,* December 2020. CCC figures refer to period 2025-2029.

Public First analysis finds that delivering direct household schemes running throughout the new parliament[9] in full and in line with statutory targets, would require a total fiscal envelope of £30.6bn. While this could upgrade over 5 million homes over the next five years, it exceeds what has already been planned for these schemes (by the former Conservative government) and pledged (by the new Labour government) by £18.4bn [See Part 3.1 for analysis]. Given the government's fiscal rules imply limited fiscal headroom for the next parliament, meeting this cost is highly unlikely barring a political or policy shift.

How complementary the fuel poverty and carbon targets are (both in terms of eligible households and technical solutions), matters for meeting statutory objectives with limited capital resource.

Practical (homes and households): There is limited overlap between the households that the statutory policies must target. Public First analysis of the English Housing Survey shows that fuel poor households have varying levels of carbon emissions (see Figure 1). This raises challenges for ensuring that taking homes out of fuel poverty could also notably contribute to reducing emissions.

Two-thirds (2.1 million) of fuel poor households have greater than average carbon footprints (i.e. they are in the top five deciles for emissions). We estimate that these 2.1 million fuel-poor-high-emitting households alone contributed over 12.2MtCO2 in 2021[10]. That is equivalent to 8% of homes emitting 18% of the UK's total residential emissions.[11]

It might therefore seem sensible to target this overlap as a priority. However, identifying these homes in reality would be extremely challenging and designing an entire scheme even more so. Existing programs, such as ECO4, have shown the practical limitations of attempting to identify homes with stringent criteria - struggles to identify and recruit these participants are the main barrier that providers cite in reducing the speed and cost-effectiveness of any scheme.

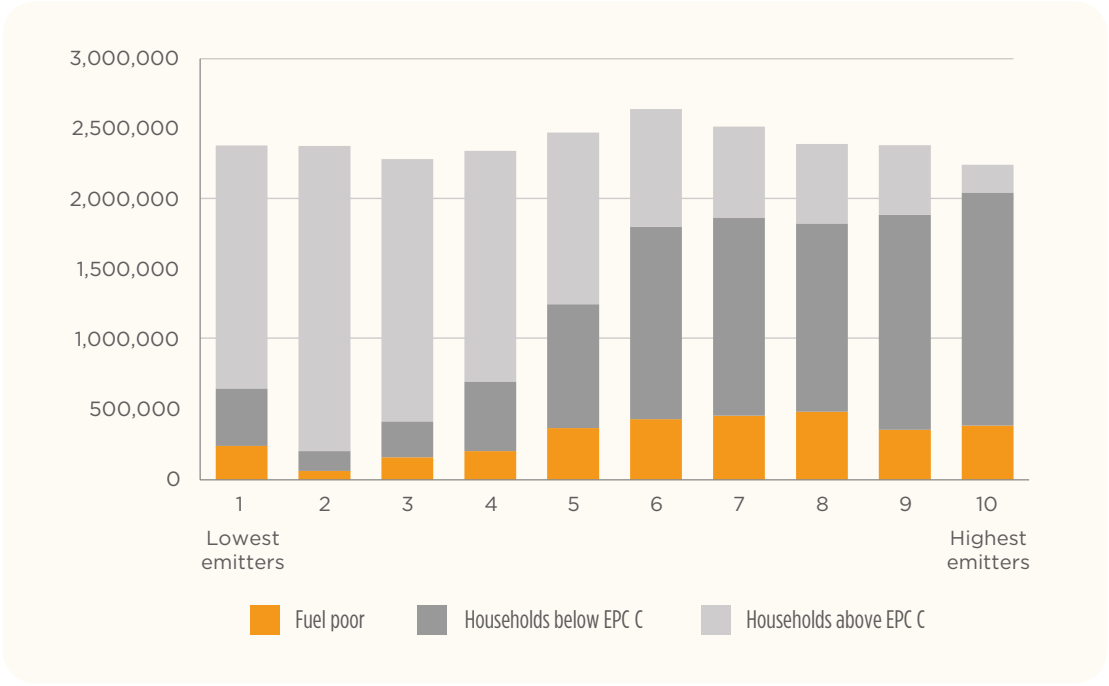
Additionally, this group of 2.1 million fuel-poor-high-emitting households represents just 17% of the total 12.2 million households with above average carbon emissions. The government must therefore design policies that target different types of households to upgrade 5 million homes for fuel poverty and carbon abatement objectives.

9 Social Housing Decarbonisation Fund, Local Authority Retrofit Scheme, Boiler Upgrade Scheme and Energy Efficiency Grant. Analysis accounts for investment delivered through existing supplier obligations.,

10 Falling to an estimated 4.9MtCO2 in 2023 due to warmer weather, resulting in less energy use in homes. Higher energy prices may have also impacted consumption.

11 Public First, *Greenhouse Gas emissions in the UK,* March 2023. Residential emissions refers to CO2 from domestic homes, mainly a result of natural gas for heating and cooking.

Figure 1: Number of households by emission deciles, England



Source: Public First analysis of English Housing Survey 2021 and EPC open source data.

Cost: Depending on the property, varying combinations of fabric measures, clean heat, micro-generation (solar PV) and storage will deliver the most comfortable, cost-effective carbon, cheap-to-run solutions. However, for many fuel-poor-high-emitting households this will require significant capital investment as they are most likely to be solid walls that are costly to insulate and decarbonise.

In efforts to be cost-effective, households in fuel poverty often receive fabric measures to lower energy use, fuel bills and increase health and comfort. These measures do not reduce carbon as much as replacing fossil fuel heating systems with electric ones - the impact of which on energy bills depends on consumption patterns and the efficiency of the home and the heating technology.[12] This is partly due to the cost of electricity being higher than gas. Delivering deep fabric measures and clean heat, as well as micro-generation (solar PV) and storage will be critical to solving for both fuel poverty and carbon emissions, but currently the policy framework for the cost of electricity does not enable this (see further detail in Part 2.2).

Public opinion: The fiscal requirements for either target add to the political challenge of 'who benefits'. Given the upfront cost for upgrades serves as a key barrier to uptake, public funding will need to play a role in supporting a range of households. The public are most likely to want 'everyone' to be eligible for financial support for upgrades (43%), followed by those in fuel poverty and those with lower incomes (both 30%). Government funding eligibility based on homes with the greatest carbon footprint is relatively unpopular (10%).

12 Many fuel poor homes with electric night storage heaters face high energy bills due to inefficient technology in comparison to heat pumps.

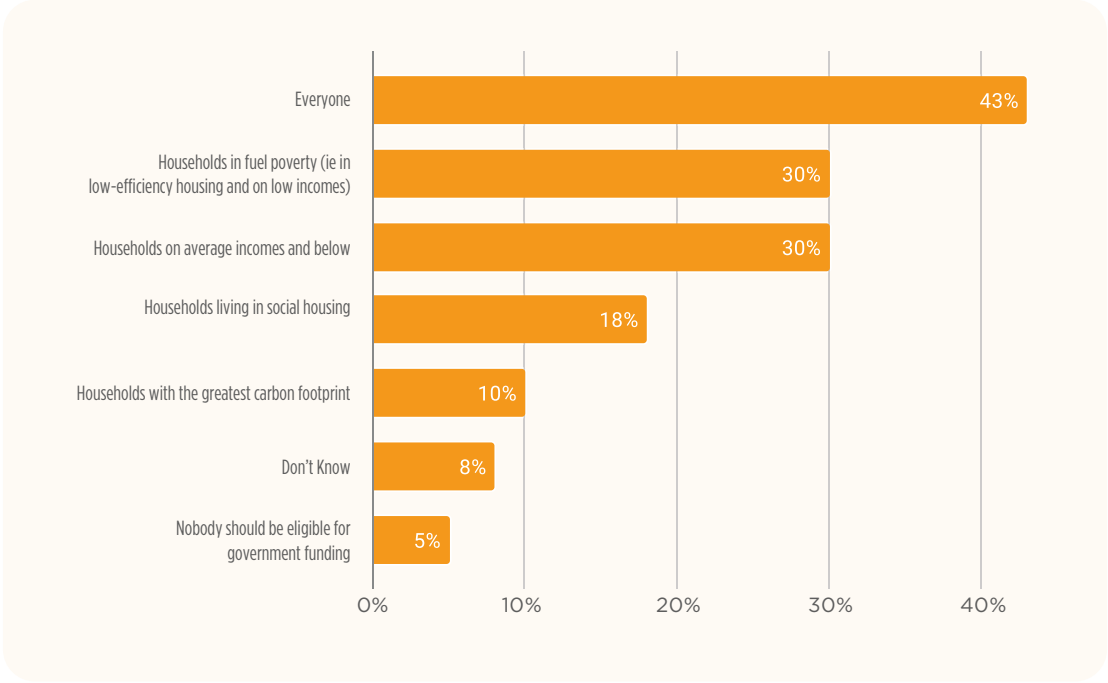
The public think it is unfair that many low income households, that have been hit hardest by inflation, miss out on government support because of strict eligibility measures.

> *"There's a lot of people who are on very low incomes who just miss the threshold of being eligible for anything. So you've got people who are working class people who are actually at poverty point, but they miss out on the support for means tested."* Female, aged 39, homeowner, high socio-economic group

> *"If I could [switch to a heat pump], I would do it in a heartbeat. But with the boiler, changing that a couple of years ago, it was cheaper just to get a more energy-efficient gas boiler...It just seems very unaffordable and the government schemes I have seen, I either haven't qualified for or it's just not enough to cover it."* Female, aged 25-29, homeowner, high socio-economic group

As a first priority, the new Labour government must set out how a Home Upgrade Plan will make progress and allocate funding towards meeting its statutory targets. Achieving the objectives of eliminating fuel poverty and meeting carbon targets with constrained public finances will likely mean providing varying levels of funding support to a broad range of households and for potentially different measures. Given the inability of fuel-poor households to meet the cost demands of upgrades, compared to wealthier households in inefficient homes, it is a political imperative that the government ensures that funding allocated to upgrading low-income and fuel poor homes covers the full cost of upgrades. The current cost of living crisis has seen a further 'squeezing' of the middle classes. The politics of this means that where possible, the government should also ensure partial support is available to all household types with a focus on carbon-saving measures to leverage private finance and prepare homes for the transition to clean heat. The latter will be essential to building supply chains and driving down costs through higher uptake (see Part 2.4).

Figure 2: The public want more homes to be eligible for government support



Survey question: Labour has committed to funding energy efficiency improvements for British homes. In your view, who should be eligible to receive this government funding? Select all that apply.

1.3 Principles for delivery

The scale of the energy-efficiency and clean heat challenge means that there are many models proposed for how best to fund and deliver this transformation of the housing stock. These models range from the state to market-led; devolved to central governance; and 'street-by-street', 'area/place-based', 'neighbourhood-led', 'locally-delivered' or myriad other terms for aggregated demand to an emphasis on individual homes. These debates are useful in the design of a longer-term mission, but designing and building capacity in any model takes time and resources and any of these grand plans will need more people, money and public consent. This section considers principles for how to build on the existing ecosystem to meet the government's ambitions.

> ***"The Warm Homes Plan will offer grants and low interest loans to support investment in insulation and other improvements such as solar panels, batteries and low carbon heating to cut bills. We will partner with combined authorities, local and devolved governments, to roll out this plan. Labour will also work with the private sector, including banks and building societies, to provide further private finance to accelerate home upgrades and low carbon heating."*** - The Labour Party Manifesto, June 2024[13]

Getting a Home Upgrade Plan off the ground this parliament, with constrained

13 The Labour Party, *Labour Party Manifesto 2024*, June 2024

funding, will require pragmatism in building on existing mechanisms and utilising private-public partnership. The government's 2024 manifesto has indicated a mixed approach to funding and delivery, including banks for private finance alongside public funding, and local government to deliver upgrade plans. This is broadly the right approach. However, achieving this pledge will require the rapid development of new capacity in local government as well as building on the successes of supplier-led delivery (as part of obligations for energy suppliers to install measures for fuel poor homes); working with banks to design attractive loan terms; and laying a foundation for different models of delivering low-carbon heating.

The government is right to invest in local government to build capacity for delivering energy-efficiency and home heat upgrades. Local government will be central to delivering effective net zero and fuel poverty strategies. Successful navigation of the energy transition requires local planning to coordinate between infrastructure for heat, transport, the grid and more, and for fuel poverty, local authorities know their constituents, housing stock and supply chains best and therefore have an important role to play in identifying who needs support. However, existing local government delivery is patchy. Local authorities with lots of social housing, and dense, uniform and urban housing, tend to have delivered more retrofit and developed their supply chain more than others. The wider funding environment for councils also plays a significant role – following over a decade of funding cuts, analysis from the BBC found that 90% of councils now have a total debt level of £97.8bn.[14]

It will take time - likely longer than this parliament - to see significant scaling of local authority delivery beyond the areas that are already progressing. This will depend on the wider economic conditions, as well as a number of policy actions that the incoming government can take to equip local (and combined) authorities to deliver for their constituents. Therefore it is essential that the government continues to build on the successes of existing mechanisms, such as the supplier obligation, both for private funding and an existing supply chain for delivery.

'Street-by-street' approaches to delivery are the right aspiration - but we do not yet have the foundations to do this effectively. A 'street-by-street' or area-based approach is when a group of homes within a (usually urban or suburban) neighbourhood are upgraded with energy-efficiency or clean heat measures as part of one contracted project. There are efficiency and social benefits to this. Not only does it drive down costs per home, a larger-scale project in one neighbourhood builds local supply chains through a consistent pipeline of work and creates social proof for others nearby, making them more likely to consider upgrading their home. Public First's polling found that 56% of the public said they would be more likely to improve their home's energy efficiency if a contractor was doing their whole street at one time, compared to 39% who said it would have no impact. The efficiency benefits also extend to wider energy infrastructure - planning for area-based approaches enables decisionmakers to understand which technologies will be operating where and when. This can inform more accurate investment decisions on electricity grid expansion, the installation of district heating solutions, and decommissioning the gas network as

14 BBC, *Councils in crisis: Town Hall debt levels staggering, MPs warn*, January 2024

more homes electrify.

Street-by-street is the right approach for scaling upgrades, particularly for clean heat. However, the delivery framework (financing, procurement, supply chain and resident engagement) has not yet been developed beyond hyper-local cases. These are predominantly in social housing estates and well-resourced combined authorities, for example Greater Manchester Combined Authority. The government must first develop the right policy, finance and procurement frameworks - as we explore throughout this report - before proceeding to a 'street-by-street' approach [See Part 2.2 for policy recommendations]. In the meantime, it is important to continue to develop the individual household market for energy-efficiency and clean heat, particularly in rural areas.

Part Two:

Policy

Part Two: Policy

The government faces significant challenges to their ambition to upgrade millions of homes this parliament. Part Two presents the building blocks that begin to reduce political risk and enable more rapid home decarbonisation later. We divide these enabling blocks into five parts:

2.1 Build public knowledge and trust

2.2 Set a clear roadmap for decarbonising heat and buildings

2.3 Improve the performance of existing schemes for households in need

2.4 Prime the market to unlock private finance

2.5 Grow the home upgrade workforce

Part 2.1

Build Public Knowledge And Trust

69%

of the public think it would be helpful to understand how a heat pump would impact their energy bill.

38%

of the UK public think it would be extremely helpful to know “who to speak to if something goes wrong.”

Only 11%

of the public expect Labour’s pledge to improve the energy efficiency of 5 million homes in England by 2030 will be achieved at the scale that was promised.

2.1 Build public knowledge and trust

So far, government action to move us towards net zero has largely happened behind the scenes and outside the home, most notably via the expansion of renewable energy and the closure of coal-fired power plants. The next five years is the testbed for how households start to interact with the net zero transition in their own homes. The political viability of upgrading homes for energy efficiency and clean heat as a whole depends on how these first five years play out - how an incoming government talks to the British people about the transition, builds their trust and knowledge in the project, and puts in place the right frameworks to protect them is essential to the long-term future of home decarbonisation. Only then, in conjunction with the right market factors, can any government build towards legislative sticks for phase-out dates.

So far, latent demand has been undermined by confusion and low trust, as well as cost. Although the public see reducing energy bills as a national priority, and aspire to make upgrades to their home, they lack the incentives to do so and face many critical barriers, including:

1. The way 'retrofit' is framed is not appealing
2. The public are unconvinced of the benefits *to themselves* of taking action
3. The public are confused by the complicated network of agencies offering them advice
4. The public and tradespeople are concerned about quality of installation
5. The public do not believe in the government's ability to deliver decarbonised homes.

These problems have been exacerbated by the boom and bust nature of energy efficiency policy over the past decade. To address these barriers the incoming government must take action to achieve the following objectives:

1. Improve public information
2. Make consumer protection frameworks more robust
3. Deliver on wider policy programme (Part 2.2)
4. Convince the public that delivery is achievable and desirable

This section sets out the key areas where the consumer journey for home retrofit needs to be improved. Using the findings from our public opinion research and interviews, we identify where government intervention can ensure that the considerable resource dedicated to building momentum for retrofit is not undermined by a confusing and fragmented consumer journey, or by low trust in the system or contractors.

The good news: the UK public see reducing energy bills as a national priority and want to make upgrades to their home. They continue to be worried about their energy bills, which is why energy efficiency is a salient issue. Nearly three-quarters

(72%) choose high energy bill costs as one of the most important issues related to British homes and housing, making it much more salient than insufficient housing (45%) and increased difficulties saving for a house (45%). Taking meaningful action on bills would result in a clear political win for the new Labour government.

The public aspires to install energy efficiency technologies in their homes. 50% of the British public state they are likely to upgrade their property to be more energy efficient in the next five years. This is primarily motivated by reducing their energy bills.

> *"I'd probably install solar panels [if I were to change my home], because my mum currently has some abroad on her house... it's a money saving thing to be honest."* Female, aged 35, homeowner, low socio-economic group

From a messaging perspective, the public see energy efficiency measures as aspirational and a highly effective way for the government to reduce its carbon emissions. The public associates energy efficiency with a modern, futuristic home. 55% of the public want their future home to have heat pumps and good insulation, third only to large windows and natural light (59%) and a garden (72%). We found that messaging around home improvement and upgrade were most effective, as we see in initiatives abroad such as France's MaPrimeRenov (My Great Renovation), and the loan marketing of Germany's KfW development bank.

> *"If money wasn't a thing and there weren't more important things that you need to spend money on, then I would love to do everything to make my house more efficient."* Female, aged 25-29, homeowner, low socio-economic group

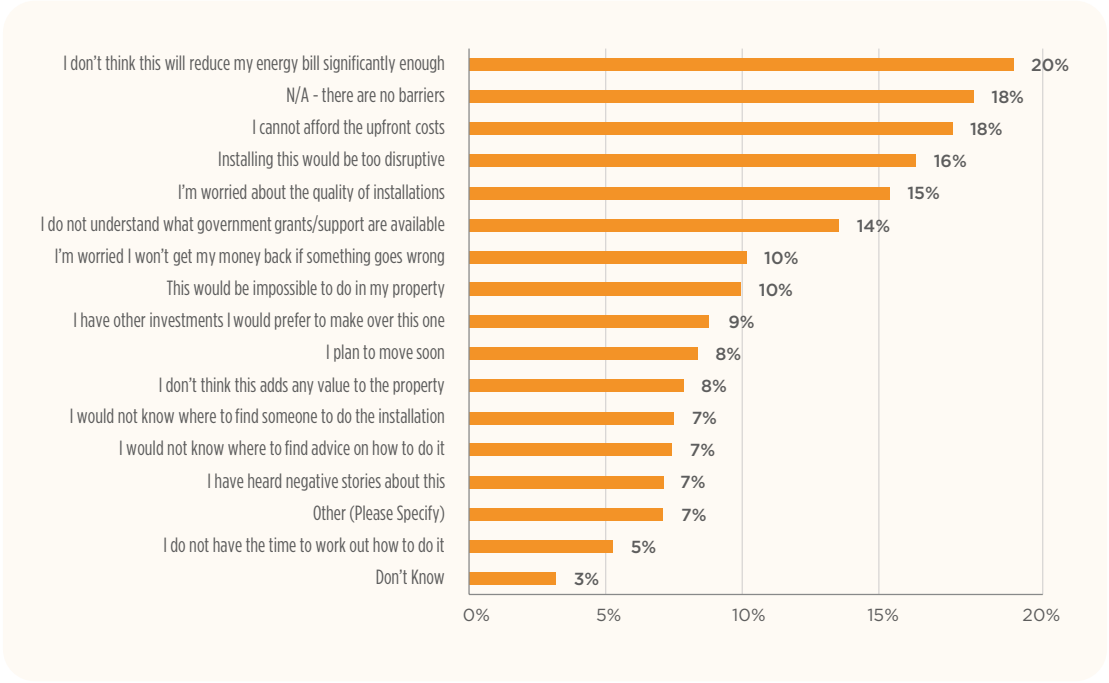
> *"If I could [switch to a heat pump], I would do it in a heartbeat."* Female, aged 25-29, homeowner, high socio-economic group

Energy efficiency is strongly associated with reducing dependence on fossil fuels, and viewed as an highly effective way to reduce UK carbon emissions. Improving energy efficiency is seen as one of the most effective ways the government can reduce the UK's carbon emissions (36%), above renewable energy deployment (34%), restoring biodiversity (14%), and electrifying public transport (17%).

Whilst there is clearly opportunity here, there are also many barriers that prevent homeowners from taking action. These are not all centred around upfront cost. Cost is a key reported barrier for homeowners to make upgrades, but low levels of uptake persist despite private finance options and government grant schemes. In its first year, the Boiler Upgrade Scheme saw slow progress with just 45% of available vouchers issued, though this has improved since the grant was increased last October. Local authorities also encounter reluctance when offering residents free upgrades: one authority told us they had had to visit homes 41 times when trying to sign homeowners up for a scheme. As the bar chart below shows, for those that are relatively financially secure (able to afford a £5,000 emergency payment), upfront cost is one of many concerns but not the most crucial one - which is that they don't think it will reduce their energy bills enough (20%).

"[Financial support] alone wouldn't make me want to take something up. I'd have to be interested in the product already and then be looking at a way to finance it. If they just advertised interest-free heat pumps, I wouldn't probably just go 'okay fine" Male, aged 35-39, homeowner, high socio-economic group

Figure 3: Barriers to installing energy efficiency for the public that can afford a £5,000 emergency payment are not dominated by upfront cost



Survey question: Which of the following are the biggest barriers to you installing more insulation (e.g. double-glazed windows, loft or wall insulation) in your property? Select up to three. [Only those who stated they would find it very easy, easy or neither easy or difficult to afford a £5,000 payment].

Our research shows that homeowners' enthusiasm for upgrades wanes at different stages along their consumer journey. For the average homeowner, the friction starts early on. They do not feel equipped with sufficient knowledge of the costs and benefits of different technologies and have low trust in delivery - both in terms of technical installation and the wider policy ambition.

Upgrading homes for net zero has a comms problem. Low trust in key actors prevents uptake of energy efficiency measures and poses risks to future government policy. Biggest amongst these is the spectre of a concerted backlash towards any gas boiler phase out mandate (as seen in Germany, which has discarded the policy entirely). Smoothing the consumer journey and building trust in key actors *now* will enable government policy to be more interventionist later. The local authorities and industry stakeholders we spoke to emphasised the importance of central government devoting time and resource to good engagement now. Several European countries enjoy a coalition of consumer and industry support in favour of a heat pump mandate,

for example Norway, France and Denmark.[15] France has been instituting heat-pump enabling policy since 2005, and has fostered allies from across the political spectrum and outside the energy sector. The UK must learn from this example and lay the groundwork now for more interventionist policy later.

1. The way 'retrofit' is framed is not appealing. It is better to use language about 'upgrades' and 'renovations' rather than 'greening' and 'retrofitting.' The public has a low awareness of relevant technologies, meaning marketing can often feel jargon-filled. In fact, we found that the public claim to be more aware of a made-up term 'eco-glazed windows' (53% had heard of the term) than they were of the terms retrofit (45%) and heat network (41%). For the majority, their focus is on energy bill savings above anything else, but we found in our focus groups that low income groups are more motivated by comfort, and high income groups by home improvement.

> *"I am very much into environmental impact and everything. But on the flip side, it's the cost of these items. And quite often the payback period.... I felt it doesn't sort of quite stack up to me."* Female, aged 55-59, homeowner, high socio-economic group

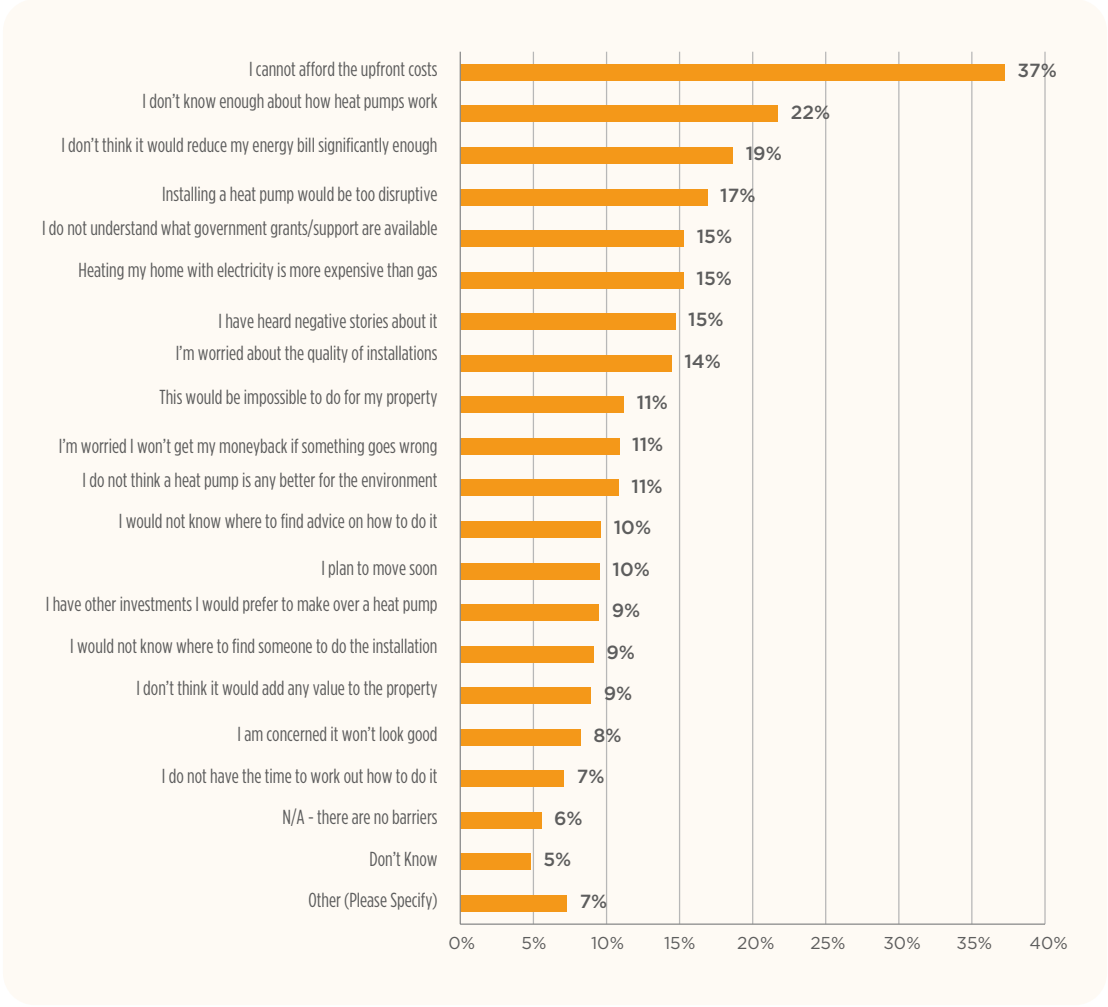
2. The public are unconvinced of the benefits of taking action, partly because they have unrealistic expectations of bills savings and limited awareness of the pros and cons of retrofit. 49% of the public that are considering a heat pump are doing so to reduce their energy bills. It is therefore unsurprising given the cost of electricity, that a key barrier for the public to install a heat pump centres around a concern that it won't reduce their energy bills enough (19%), and a lack of awareness of how the technology works (22%) - see below chart - and 69% of the public think it would be helpful to understand how a heat pump would impact their energy bill. The public want to see more significant savings before they will change their behaviour. This observation about human psychology is consistent across different areas of government intervention: for example, when the Conservatives offered two successive small tax cuts at fiscal events and there was no positive uptick in sentiment towards the Party.[16] Put simply, the public are not impressed by small savings which are seen to make minimal difference to their monthly budget.

> *"I know a woman who'd had solar panels and paid nine grand or so and it was four years ago and she still hadn't seen a return.... Over the year £144 is not that much, it doesn't even match the direct debit for your energy."* Male, aged 41, homeowner, high socio-economic group

15 The Guardian, *'You can walk around in a T-shirt': how Norway brought heat pumps in from the cold,* Nov 2023

16 The Guardian, *No bounce for the Tories after tax-cutting budget, poll shows*, November 2023

Figure 4: The barriers the public face when considering a heat pump centre around a lack of awareness of the technology, certainty of outcomes, and upfront cost



Survey question: What are the main barriers to you installing a heat pump, if any? Please select up to five.

3. The public want more information, but are confused by the complicated network of agencies offering them advice. The public struggle to access information that is relevant, tailored to them and trustworthy. The above Figure 4 is evidence of this - many of the barriers to installing a heat pump centre around a lack of awareness and anxiety about the suitability of technology. The public feel too ill-informed to make a decision about whether a home upgrade is right for them - as is clearly shown in Figure 4 (above), and validated by our focus groups. The public are not certain of the expected outcome e.g. impact on energy bills and durability, or whether specific technologies are suitable for their home.

In our research it is clear that the public feel that existing advice and information is not adequate for them to make an informed decision. The public either have not heard of the government site giving information on retrofit, or have had a bad experience with it. This was raised without prompt in our focus groups - the public find it difficult to navigate and not particularly useful, and felt it acted more like a directory to other agencies rather than a source of information itself. For example, guidance on

consumer rights and issues with ECO directs the public to second parties such as Citizens Advice which receive no dedicated funding for this service.[17]

> *"I did go on the government website and then it brought up a list of different companies. And I just got pretty lost..."* Male, aged 37, homeowner, low socio-economic group

> *"There is this disconnect between what might actually work in my own home and the information that is available to make that decision."* Female, aged 40-44, homeowner, low socio-economic group

It is unclear who the public trust most, and no single actor is most trusted at every stage of the upgrade process. Whilst local authorities, consumer advice organisations, tradespeople and friends and family tend to be highly trusted, this ranges by stage in the process. For example, friends and family are trusted on what steps to take. For energy suppliers, there are mixed views; some consumers are highly sceptical of their motives in giving advice ("they want to sell me something") while others believe they are well placed to offer their expertise.

Consumers are most trusting of advice when it is validated across different actors. Homeowners need coherent and tailored advice content that is standardised across a range of actors, who will then deliver the advice in their different ways based on consumer need. Government should leverage existing contact points and trusted agencies, for example tradespeoples and consumer bodies to deliver standardised government-led advice, in the same way that NHS information is white labelled.

> *"It's a minefield out there... We even get confused sometimes. You've got NEA, Citizens Advice, AgeUK. We've found that having our council-routed energy advisors has for the first time started to bring that together..."* Local authority

> *"They'll speak to six or seven different trades, and every trade will tell you something different. As a homeowner, a customer, you're like 'well which one do I listen to? Who do I believe?'... you need some sort of government guideline. Surely customers should have a site to go to."* Male, aged 38, joiner and window fitting, sub contractor.

4. The public and tradespeople are concerned about the quality of installation. Consumers' pursuit of quick and sizable reductions in their energy bills and low levels of knowledge mean they are vulnerable to being mis-sold quick fixes and poor quality products. In launching the Green Deal in 2010-12, the government actively communicated measures to put off 'cowboys'.[18] Even with this, subsequent reviews found an increase in rogue traders,[19] and there have been several high profile cases of "botched" installations that have been blamed on a lack of oversight and regulation in

17 Gov.uk, *Help from your Energy Supplier: Energy company obligation,* accessed July 2024

18 *UK Government*, *No place for cowboys in Green Deal*, December 2010

19 Access Training, *TrustMark report increase in Green Deal cowboys,* January 2013

the industry.[20] Progress has been made to address quality issues and consumers are significantly more protected than they were a decade ago: for example policy schemes require PAS compliance, accreditation for installers, and guarantees. However this means that, there is a consumer protection inequality between upgrades delivered through policy schemes versus those that aren't. As the market for home upgrades develops and more measures are installed through private finance, likely outside of policy schemes, the risk of rogue traders may increase. While guarantee systems such as the Installation Assurance Authority (IAA) support the insulation sector, further models should be considered for increasing consumer protections for clean heat instals. Enabling measurements of the real performance of homes in the EPC methodology (see Part 2.2) will help to secure better outcomes, provide assurances to consumers of the benefits of upgrade work, and hold poor quality installers to account.

Consumers lack information in the pre-shopping and post-installation phases. In our poll and focus groups, it was clear that the public are concerned about installation quality and redress. 38% of the UK public think it would be extremely helpful to know "who to speak to if something goes wrong." There was worry about the quality of installations (14%) and that they won't get their money back if something goes wrong (11%). The tradespeople we spoke to thought that cowboy installers were reducing consumer trust in technologies.

> *"You will just get anyone fitting them, as it's done now, and there are a lot of problems."* Male, aged 46, gas engineer, SME owner.

> *"When I was offered my new boiler, I made sure that what they gave me wasn't going to break down in the next five years... you've got to make sure that what they give you is not something that's just a tick box, something that breaks down, but is good quality as well."* Male, aged 45, homeowner, low socio-economic group

Research from Which? affirms our findings, describing how homeowners face "significant anxiety" in choosing tradespeople to fit low-carbon heatings systems after "press stories about poor work and rogue traders."[21] In the post-installation phase, Citizen Advice research shows that the public often struggle to identify available routes to redress, for example ombudsman schemes, and more vulnerable consumers can struggle to navigate them alone when they try.[22]

Not only can poor customer experience impact wider consumer trust and uptake, it also has a human cost. Poor installations can have long-term financial consequences for households where remediation works can be costly, which may also have longer-term wellbeing impacts.

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20 BBC, *Insulation scandal: 'I have to scrape mould off the walls',* May 2024

21 The Guardian, *Make accreditation mandatory for low-carbon heating installers, says Which?* May 2024

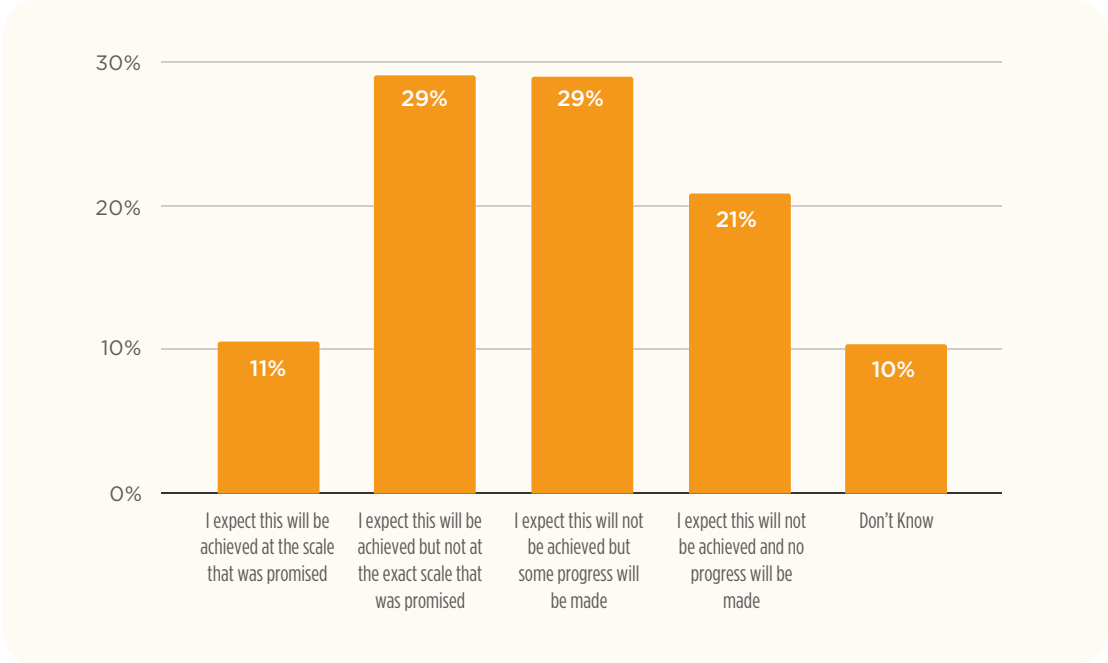
22 Citizens Advice, *Confusion, gaps, and overlaps,* April 2017

5. The public do not believe in the government's ability to deliver decarbonised homes. Only 11% of the public expect the Labour government's pledge to improve the energy efficiency of 5 million homes in England by 2030 will be achieved at the scale that was promised - and almost double the number (21%) expect no progress to be made whatsoever. This is, in part, a symptom of wider trends towards lower faith in political promises and government delivery of projects. However, perceptions of government delay on technologies such as electric vehicles, and Sunak's high-profile delay of clean heat legislation in September 2023 have reduced the public's (and tradespeoples') belief that homes will need to be upgraded.

> *"I feel like they always push the dates back. They did it with diesel cars. So they'll push it back or something will change. [...] I think [a phase out date] might happen but there will be loopholes."* Female, aged 25-29, homeowner, low socio-economic group

> *[Gas boiler phase out] "It's not going to happen for a long time. Way after 2050... they did try to introduce a policy where they said that the boiler manufacturers had to sell X percent of heat pumps. Now they've scrapped that."* Male, aged 43, plumber in a SME.

Figure 5: Perception of the deliverability of Labour's Warm Homes policy



Survey question: Labour has said it will improve the energy efficiency of 5 million homes in England by 2030. How likely or unlikely do you think it is that the Labour government will achieve this?

This not only creates friction for those that want to do something to lower their energy bills and improve their efficiency, but it undermines trust for individuals that are eligible to get it for free. As already mentioned, local authorities have to put in a lot of intensive effort to get homeowners on board with schemes - with one authority visiting each eligible property an average of 41 times. In our polling we asked the public if they would accept a free upgrade from their energy supplier, local

authority and landlord - notably there was little variation between actors but for those that would decline the barriers were centred around a lack of trust, questions about whether the upgrade was truly free, the quality of the product, and a lack of perceived benefits.

The government must equip households with the information they need to upgrade their homes and a robust consumer protection framework.

Net zero homes are as much about people as they are about infrastructure - the government needs to appeal to the public, advocating for home upgrades and how they will benefit the families living there. Money is not the only solution – there are crucial barriers beyond cost that policymakers must solve to build trust and legitimacy. As the previous section detailed, the public struggle to access information that is relevant, tailored to them and trustworthy, and are concerned about the quality of installations, and outcomes of installation.

We recommend the following solutions:

- A programme of national public engagement - the National Home Upgrade Programme
    a. A national campaign communicating the benefits and the future of home heating
    b. An improved government digital platform
- An improved consumer protection framework, the success of which hinges on an enabling policy environment for retrofit.

This section considers other measures which would help to overcome information barriers, such as a network of one-stop-shops in England and subsidised home energy assessments, but finds that an incoming government's capacity and resource would be better used elsewhere.

Improved information

The government needs to communicate more effectively with the British people about upgrading homes and where they can find more information. Whilst government works behind the scenes to deliver the right incentives and policy framework, a national information campaign and improved government-led advice content should increase awareness and ensure public buy-in towards the policy objective.

The government should launch a **National Home Upgrade Programme (NHUP**) - a flagship, long-term government communication campaign to upgrade and decarbonise homes. The NHUP would bring together all government information campaigns on energy-efficiency, clean heat, and smart-tech (e.g. smart meters) with improved online tools under one household-facing banner. The NHUP would aim to overcome stubborn barriers of low public knowledge and trust, as well as financial barriers, by informing households of why our homes need upgrading and the benefits of doing so; which technologies are suited to our homes; and what funding schemes are available. Important features of this proposition include:

1. **A single name and mission to build knowledge and trust over time.** Historically, short-term schemes undermined demand and trust. A long-term policy trajectory is key to delivering this parliament and for the next two decades. This requires more than cross-departmental coordination and public-private partnerships: households need to be brought along too. By promoting a single banner for the Home Upgrade mission, NHUP maintains longevity and minimises disruption when certain schemes may need to be off-ramped or modified. The NHUP is also inclusive for all households, addressing a key challenge from our public opinion research that households want a Home Upgrade Plan to support *everyone*. Through NHUP, all households could access information and support at the very least.

2. **A national campaign communicating the benefits and the future of home heating.** The purpose of this national campaign is to build momentum, and increase consumer awareness and confidence. An incoming government needs to focus early on building market trust and reversing the damage caused by previous governments - which has made technologies such as heat pumps and electric vehicles less attractive. For maximum impact, this must come from the centre, backed by DESNZ, MHCLG and No 10.

   Our research found that the public care most about the personal, tangible impact on their lives. A campaign must first communicate the benefits of technologies and (following a clear decision on rebalancing levies [See Part 2.2]) the cost of electric heating will fall, clearly set out that hydrogen is not an option, and signal the public to Gov.uk for more information. Learning from Germany's mistakes, only once awareness has increased and trust in government direction improved can a campaign set out the plan for gas phase out.

   "All I want to know is am I going to get a return on investment. Am I going to be poor or not?... I care about very little else." Male, aged 31, homeowner, low socio-economic group

   Unsurprisingly, different messages work better for different demographics - an area that requires more detailed message testing. We found in our focus groups that lower income groups tended to be more motivated by comfort and immediate and sizeable energy bill reductions compared to higher income groups (the able-to-pay-market) who were a little more interested in the impact on property value and more comfortable with smaller bills savings across a longer time period.

3. **An improved government digital platform.** A centralised source of information, from a trusted and recognised voice and with clear, accurate and actionable information for homeowners is crucial. While there are emerging offers within the market from Centrica, Octopus and others, and statutory organisations such as Citizens Advice play a crucial role in offering expert independent advice, the public want to hear from the government. An improved digital platform will provide a clear single point of information that will help to ensure

a consistency of message and increase trust in and legitimacy of the clean heat project.

The government digital offer needs to be improved to include a better user experience, clear communication of the benefits of technologies (which reinforce the campaign), links to funding schemes, and eventually links to heat network zoning information once these are developed by local authorities. Consumers need a user-friendly interface, providing clear onward journeys, from which an individual can find out whether they are eligible for funding, if a heat network is planned for their neighbourhood, and which local installers are suitably accredited.

It would not provide expert tactical advice on installation or on consumer rights. Here, NHUP would signpost households to relevant experts and organisations (e.g. energy suppliers, accredited installers and statutory consumer protection bodies).

It will be important that this centralised information is accessed and used by other organisations, for example AgeUK, that may be better trusted by marginalised or vulnerable groups of people and able to tailor the information to their needs. Therefore, the government should ensure digital resources can be white labelled and hosted on other organisation websites.

NHUP would provide UK-wide and nation-specific information: given that energy-efficiency is devolved, NHUP would signpost households to devolved programmes i.e. Home Energy Scotland, while also providing UK-level information on the need to upgrade homes and the future of heat.

One-stop-shops (OSSs) are a developing model in other countries but should not be a focus of an incoming government's resource. They are a physical destination that brings together in one place all the advice a homeowner would need throughout the entire retrofit process, including information on who to hire, how to access redress and which technologies are suitable. In Ireland, the OSSs are regulated by the government and similar models are being launched in Scotland, France, Spain and Latvia.[23] In England, no such centrally-funded localised advice service exists.

The clear benefit to one-stop-shops is that they can streamline and standardise advice to the public, who find the current ecosystem of advice confusing and contradictory. There are several drawbacks. OSSs may not leverage pre-existing and trusted local agencies, but instead sets up a new government-backed brand which can take time and resource to build public trust in and awareness of. In the case of the highly effective call-service set up by the Scottish government[24], it may be hard to replicate across England given the scale difference (Scotland has roughly the same population

23 *Energy Cities*, *Coming soon: a European community of local one-stop shops for home energy renovation,* October 2023 / The Existing Homes Alliance, *Making Retrofit Work - a customer journey with people at its core*, November 2022

24 Energy Saving Trust, *Decarbonisation of the Power Sector,* November 2022

as South West England).

Creating a government network of one-stop-shops is not an efficient use of officials' capacity and an incoming government's finance. One-stop-shops are developing as a model across the private and NGO sector already. Improved government information, designed so that it can also be used and distributed by other organisations will help to maintain consistency across the emerging UK one-stop-shops. Officials should keep an eye on how these develop and consider if they might need regulation or an accreditation framework in the future.

Fiscal constraints mean the government should not fund free home energy assessment for 'able to pay' households. Home energy assessments are when an expert visits a home and gives tailored advice on the performance of the property and what installations may be suitable to improve its energy efficiency. Government funded schemes already include a home energy assessment before and after installation as part of PAS2035 requirements. These assessments should remain funded as part of existing scheme.

However, there is a wider policy debate as to whether 'able to pay' households should be able to access standalone free home energy assessments from the government to reduce information barriers. Over a third of the 'able-to-pay' public (those that could afford a £5,000 emergency payment) agree that a free home energy assessment would make them more likely to invest in energy efficiency improvements - triple the share of those that state a bank loan as part of a mortgage would make them more likely to make an upgrade (11%). However the average cost of an assessment is around £400, which homeowners are understandably reticent to pay for out of pocket.

Across the sector, businesses and councils are developing initiatives to support households. Greater Manchester Authority is supporting a local start up *Your Home Better* to innovate in this space and aiming to keep the cost for an assessment as low as £100. Additionally, innovation from thermal imaging is helping to improve information without entering the home itself. While this technology will not replace the accuracy of an in-home assessment, it can help local authorities, businesses, and households better understand the property's performance at a low-cost. This can also better improve council's targeting and monitoring of existing schemes.

Fiscal constraints this parliament mean that funding should be concentrated on measures that deliver energy and carbon-saving benefits, rather than standalone free home energy assessments for 'able to pay' households. However, government should monitor innovation in this space and ensure the policy framework enables households to access information that could help them upgrade their homes.

Enhanced consumer protections are a vital way to build trust in technologies, and certainty in the outcomes of installation. Many organisations have suggested that upfront consumer guidance is the route forward, creating more informed customers able to make better judgements. This follows the examples of Scotland and France. This will help, but we also need to put in place greater consumer protections and post-installation support for the public. As Nesta evidences, when going through the process of installing a heat pump, consumers should:

1. Be confident that the technology is working well and efficiently
2. Know when the technology is not working as it should
3. Know what to do about poor operation of the heat pump, either themselves (if appropriate) or through the contacting of a professional
4. Have a good experience of their heat pump system
5. Be able to advocate to others about heat pumps and their operation and performance as well as how they contribute to low carbon heating.[25]

But the clean heat market is a confusing system of actors with overlapping responsibilities, little power to enforce standards, no channels to report and refer consumer complaints to effective enforcement bodies through a statutory advice model, and many codes and accreditations that are still in development. An example of this confusing system is that there are several separate consumer codes (RECC, HIES and GGF) and several accreditation schemes, and although government schemes require accreditation, there is no such requirement for the private market. This means that:

- There are potential gaps in protections for the private market. The (delayed) Clean Heat Market Mechanism would require accreditation in order for installations to count towards manufacturers' allowances, but accreditation is not a requirement across the board.
- Governments and regulators have little ability to monitor fraud or criminal risk in the market.
- The space is crowded and not intuitive to consumers. Consumers find the ecosystem very confusing, and are not aware of their rights or what to expect.[26] Recent Which? research confirms this, showing that 55% of homeowners find it difficult to trust the available information, including contractors own claims and customer reviews.[27]
- There are gaps in the types of information available. Nesta shows that whilst FAQs are easy to find, there is a wealth of mis- and dis-information, and a lack of advice on what to do if something goes wrong.[28]
- The landscape for redress is very patchy and changes by technology. It is also very confusing: where some codes have an ombudsman, others do not, and there are multiple Alternative Dispute Resolution (ADR) schemes within the sector, of varying quality and without full coverage - for example HIES and RECC ADR processes.[29]
- Enforcement is very poor. The current enforcement landscape is a patchy network of powers and responsibilities. Ofgem and the Competition and Markets Authority don't have the right consumer law powers and necessary finance to take actions effectively and in a timely fashion, and there are neither

25 Nesta, *Improving the Heat Pump Experience,* October 2022

26 *Citizens Advice*, *Home safe: giving consumers confidence to install low carbon technologies* , Dec 2023

27 The Guardian, *Make accreditation mandatory for low-carbon heating installers, says Which?,* May 2024

28 *Sky*, *"Campaigns of misinformation' around heat pumps says energy minister amid record number of installations,* 20 Jan 2024

29 Citizens Advice, *Giving consumers confidence to install low carbon technologies,* December 2023

clear responsibilities, nor coordination of these actors.[30]

- Accreditation schemes are underdeveloped, and consumers lack awareness of them. For example, bad installers can move to a different standards body once caught out; companies that accredit installers vary in stringency; and there is no requirement for private consumers to use an accredited installer. The Microgeneration Certification Scheme (MCS) is currently redeveloping its scheme to tackle these issues.[31]

In the final section on growing the home upgrade workforce, we set out how the standards regime must change in order to give the existing workforce the clarity and incentive to upskill.

30 Citizens Advice, *Home safe: giving consumers confidence to install low carbon technologies*, December 2023

31 Citizens Advice, *Home safe: giving consumers confidence to install low carbon technologies* December 2023

2.1 Recommendations

Growing demand for energy efficiency is being undermined by a confusing and fragmented consumer journey, and low trust. The current consumer protection framework is not fit for purpose and homeowners need impartial, tailored advice to help them make upgrades to their homes.

Building knowledge

- **Launch a national, public engagement campaign,** to raise awareness and explain the need to improve homes – this will have different messages for different audiences. The campaign should begin with benefits of retrofit leading up to the future of gas boiler phase-outs.
- **Improve the government digital platform** with information on what heat solutions might work for each household (linked to LAEP/heat network zoning), clear guidance on the standards, their consumer rights and routes to redress, and information on installer accreditations.
- If a network of one-stop-shops is developed at scale by local authorities, government must review the need for the development of an accreditation framework in the next parliament.
- Develop clear guidance for consumers on the standards and their consumer rights, in partnership with consumer bodies. This should include routes to make referrals to enforcement bodies and clear roles and responsibilities for consumer bodies and government departments in dealing with complex cases.

Building trust

- **Review and set out plans for how the consumer protection framework will change to support households as the home upgrade transition ramps up across the next parliament.** Whilst improved information will help, the current system needs to be simplified for example by setting up an Ombudsman, or requiring all installers to participate in an ADR scheme.[32]
- **Protect consumers against rogue trades by standardising and mandating accreditation requirements across the sector, not just through government funding schemes.** In the short term, use the NHUP to communicate the value of an accredited installer.
- **Ensure consumers can access redress if something goes wrong by reviewing the fragmented enforcement regime for retrofit.** The ongoing DESNZ review must be actioned by the incoming government as a priority. Government must set out clear responsibilities for each agency and ensure they have the requisite powers and finance.
- Increase enforcement bodies visibility of emerging problems in the retrofit process by requiring actors such as standards bodies, local authorities, and advice services and other actors capture and share data on issues.

32 Citizens Advice, *Giving consumers confidence to install low carbon technologies,* December 2023

Part 2.2

Set A Clear Roadmap For Decarbonising Heat And Buildings

77%

of the public agree that reducing the cost of electricity should be a priority for the government in the next five years.

Just 55k

heat pumps were installed in 2022 - not nearly enough to meet our target of 600,000 installed by 2028.

As of the end of 2023

65%

of councils in England had yet to formally engage with creating a Local Area Energy Plan.

2.2 Set a clear roadmap for decarbonising heat and buildings

Upgrading and decarbonising existing homes is one of the hardest net zero policies to deliver for cost and technical reasons. The previous Conservative government exacerbated this difficulty by creating an unhelpful rhetoric on the cost of net zero. As a result, progress towards their target of reaching 600,000 heat pump installations a year by 2028 is significantly off-track: just 55,000 were installed in 2022.[33] This has undermined investor and consumer confidence in the future of clean heat.

As an example, Public First analysis of the English Housing Survey finds that 1.2 million households that rated EPC C *or above* are in the top 20% of emitters as well as the top 20% of earners. Motivating these households to upgrade their homes will be critical to kickstarting the market for decarbonising heat, as they are less likely to face significant insulation or cost barriers to installing a heat pump. However, the previous government did not provide a compelling consumer offer for these households. It will be up to the incoming government to change that.

Currently, the UK does not have credible or effective policy framework for decarbonising heat and upgrading buildings. Key challenges remain:

- **The future of home heating** is unclear due to delayed phase-out dates for gas boilers, indecision on the role of hydrogen, and an underdeveloped policy framework for 'street-by-street' approaches to switching households off gas.
- **The cost of electricity** is higher per unit than gas, serving as a barrier for electrified heating.
- **Energy Performance Certificates (EPCs)** do not accurately reflect the efficiency of a home or incentivise low-carbon heat solutions.
- **New homes are still being built to carbon-intensive Building Regulations**. While this report is focused on existing homes, the Future Homes Standard (FHS) is critical to building supply chains and skills and driving down the cost of installation that will benefit existing homes as well as ensuring no more new homes have to be retrofitted. But FHS has yet to be implemented.
- **Minimum efficiency standards** are too low to deliver the pace of investment required in the private rented sector, and insulation installation rates have dropped more generally due to a changeable and complex policy landscape.
- **Permitted development rules** prevent heat pumps from being installed 1 metre within a property's boundaries.

This parliamentary term serves as the testbed for creating certainty in the supply chain, and building political and public credibility to get on track for net zero. Only then can the government deliver at pace and scale in future. This section explores the actions the government should take to build a clearer and credible roadmap to decarbonise heat and upgrade buildings. Many of these actions come at no direct cost to the Exchequer, but they will take political capital to implement.

33 NAO, *Low heat pump intake slowing progress on decarbonising home heating*, March 2024

Policy levers

The future of home heating

The previous government made decarbonising heat a political dividing line. The previous government's political rhetoric on the future of home heating has undermined the development of a clean heat market. Delays on supply-side obligations to produce heat pumps and phase-out dates for gas boilers in off-grid homes, as well as continued indecision on hydrogen, has slowed investment in skills and technology and confused consumers. Our research shows that the general public and heating engineers support a move towards low-carbon heat but currently do not know enough about the future of clean heat - nor do they believe it will be delivered. Over the past year, Public First research has found a common theme of low confidence in government delivery across politics and policy more broadly. The new government must rebuild confidence, in part by showing that it can deliver on its policy pledges. This parliament, the government must signal a clear direction of travel over the long-term to develop a market for clean heat and establish legitimacy for future phase-out legislation.

The government's plan for home heating is unclear to the general public and tradespeople. Across our focus groups and polling, we found that homeowners, plumbers and gas engineers are largely unaware of the future of home heating, with many assuming a role for gas or hydrogen. Much of the scepticism around electrified heating was due to common doubts around the effectiveness of heat pumps in the UK as well as concern about electricity prices. Beyond this, there is little awareness of alternative options, such as heat networks, which could be a heating solution for up to 20% of homes.[34]

> *"I kind of assume 'Oh well surely gas boilers will be improved'. There'll maybe be some sort of energy-efficient new gas that they can change the old gas with."* Female, aged 25-29, homeowner, high socio-economic group

> *"I think people will have a choice between gas and electric - essentially hydrogen and heat pumps like the same way we get choice with our energy supplier."* Male, aged 30-34, homeowner, low socio-economic group

> *"I just think with the climate we have, the UK will always need gas central heating, because the heat pumps are just not good enough. Me being quite young I do understand I'll be spending a lot of my career doing that, I just think at the minute they're not as developed as they should be"* Male, aged 23, gas engineer, Newcastle.

As a result, despite supporting a nationwide shift to low-carbon heat, neither tradespeople nor the general public believe the policy is deliverable. One plumber from North London said *"it's not gonna happen for a long long time, way after 2050."*

34 UK Government, *Heat Network Zoning*, January 2024

What the government can learn from France & Germany

In France, the story is one of success: heat pumps outsell boilers and their installation rate is now ten times the rate of the UK. While the incentives in France are stronger - cheaper electricity prices and lower reliance on a gas grid - the political strategy for uptake has been underpinned by long-standing grants and enabling policies, such as an independent advice service, from 2005. As a result, there is a broad business lobby in favour of heat pumps, with strong consumer knowledge and support.

In contrast, Germany's backlash to gas phase-outs should act as a warning to UK politicians. Policy proposals for a gas boiler moratorium with heavy fines from 2024 were leaked before policymakers had socialised the rationale or addressed costs. Strong opposition to the proposals resulted in delays and a steep decline in the public and political appetite. Germany is now due to miss its heat pump target by almost half - although this would still be four times the UK rate.

Shared lessons:

- Increasing public buy-in and salience will help government control the narrative and justify policy, but it takes time and often needs to start small. UK public awareness of a) the need to improve energy efficiency and move away from gas ("Gas=bad"), and b) the benefits to them personally (impact on bills and comfort) is still low.
- Technological clarity and generous transition periods from government is essential for market confidence. In Germany, there was no justification for why heat pumps were the preferred solution, and a short time horizon, whereas French industry (thanks to nuclear) is pro-electric, with lots of cross-over with a large existing Heating, ventilation, and air conditioning sector.
- Policy can quickly be co-opted by existing political narratives - to avoid this, policymakers must take consistent, progressive action to communicate the benefits of new technology and reduce cost barriers over time.
- This cannot be done quickly, acceptance is built over time - and successful policy takes years to see major results (i.e. France). The groundwork that government does now to educate consumers and put in a solid delivery framework will pay off in dividends in the future.

Lessons from Europe show that the political viability of net zero is dependent on building a market for clean heat before legislating boiler phase-outs. There are clear actions that must be taken to ensure this:

Bring forward the decision on hydrogen for heating to before 2026 and ensure the CHMM is implemented as planned by April 2025. These actions are technically and fiscally simple but require political capital to overcome opposition. Incumbent industries, and the unions representing large numbers of workers within them, see hydrogen heating as a simpler transition both for existing workers, and for underlying assets (especially the gas grid). Unlike North Sea oil and gas employment, which is highly concentrated, gas grid employment is distributed across the country. Ruling out hydrogen does not mean an end to employment opportunities for these workers.

Assets will be wound down slowly, and two-thirds of workers are over 45, with almost 40% over 55.[35] Support from unions (most notably GMB), or at least acceptance, will be vital to making this change smoothly. That requires a clear jobs and skills plan (see Part 2.5).

Develop plans for a more coordinated switch-over approach to heating, including 'street-by-street' approaches. Decarbonising homes requires a significant infrastructure transformation both at a household level and for the overall energy system. To ensure this is done effectively, the government must set out a strategy to identify which heating technologies are likely to operate where, and the potential impact that will have upon the electricity and gas grids. While some of this work is underway, local level plans vary wildly between councils and central government plans are restricted to one subset of heat networks.

Develop a market for clean heat alternatives to heat pumps and scale heat network delivery. The current policy framework for scaling alternative solutions to heat pumps is underdeveloped. Unlike individual heat pump installations that require sufficient outdoor space, alternatives (such as heat networks and shared ground loops) can either situate a small heat pump inside a home, or produce heat in a central location and distribute it to multiple homes on the network. Our research highlights two key concerns in the planning and implementation of alternative heat solutions. Currently, DESNZ is mapping where heat networks could be viable through its Heat Network Zoning in line with a commitment to introduce zoning in England from 2025. However, this focuses exclusively on high-temperature district heat networks which require investment to scale - currently comprising 3% of the market. Other alternatives such as ambient loops and shared ground loops, which can be deployed more quickly and in a wider range of areas, are not currently considered. The government should ensure that future zoning considers these solutions in order to support the deployment of 'street-by-street' approaches and speed up the decarbonisation of urban housing.

Support councils to develop Local Area Energy Plans (LAEPs) with standardised methodology. Local Area Energy Plans (LAEPs) provide a spatial plan that identifies at street-level 'what, where. when and who' is needed to decarbonise the area involving councils, district network operators (DNOs) and the recently introduced Regional Energy Strategic Planners (RESPs). The LAEP includes heat and energy efficiency as well as electricity, storage, and transport for grid upgrades and infrastructure delivery - in terms of heat decarbonisation, a LAEP tells a council which heating technologies are best suited to each area based on costs to consumers as well as the impact on the grid, the housing stock and viability of other technologies in the area.[36] This helps to direct investment in grid upgrades and form the basis for 'street-by-street' approaches to switching homes over to clean heat.

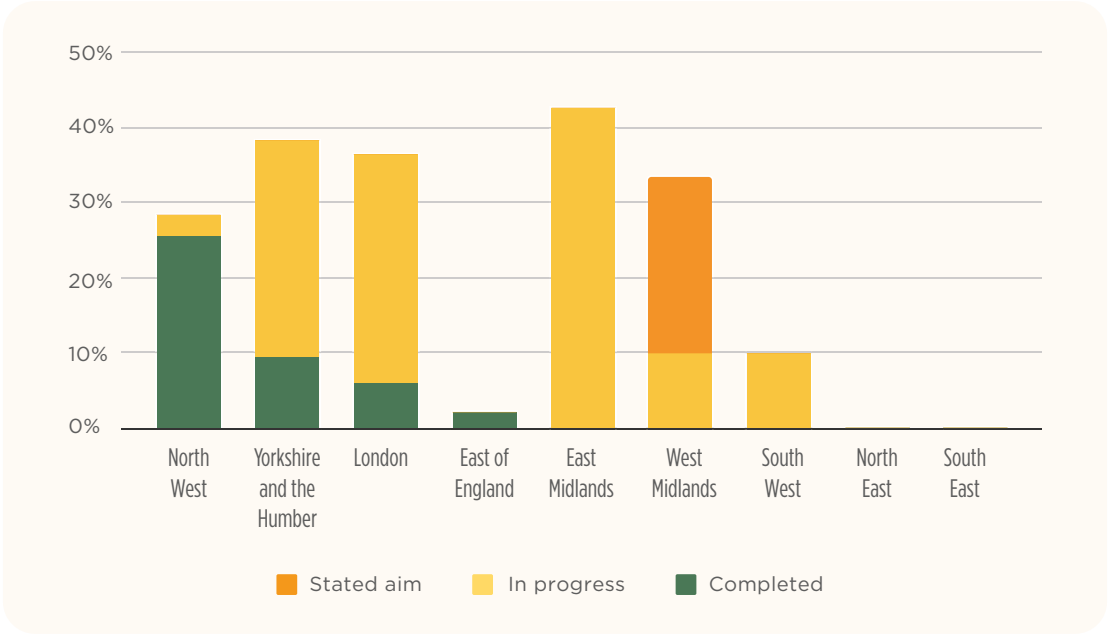
As of the end of 2023, 15 local authorities in England had completed an LAEP (5% of the total), a further 40 (13%) were in progress, and 7 (2%) had a stated aim to procure one - leaving 65% of English councils who have yet to formally engage with the

35 UK Government, *Heating and Cooling Installer Study,* January 2023

36 Catapult Energy Systems, *Local Area Energy Planning,* July 2024

process. Public First analysis finds that LAEPs are not spread evenly across regions: the North West leads in the number of completed LAEPs (10) compared to the North East and South West who do not even have a stated aim to procure one - Figure 6.

Figure 6: Percentage of local authorities with LAEPs per region (2023), in order of most completed



Source: Public First analysis of data provided by Energy Systems Catapult (2023)[37]

Cost is a barrier - we heard accounts of LAEPs costing around £200,000, although this is expected to come down as more are completed. The risk to decarbonising heat is that without LAEPs, areas of the country will be flying blind in identifying which homes will be best served by different heating solutions. This may cause delays and unnecessary costs, as well as a postcode lottery, which could undermine public support for clean heat and investment. In Public First's previous report on decarbonising the grid, we recommended that the government supports the funding of LAEPs for local authorities and that the RESP should support in identifying priority areas.[38] This remains vital. Funding should be made available from the Green Prosperity Plan as opposed to from the extra £6.6bn for capital energy-efficiency and heat measures.

Additionally, LAEPs are developed by private consultancies each with their own methodology, which raises risks for the delivery of plans across regions and shared infrastructure. A consultation on a common methodology should be launched early on in this parliament to ensure consistency across how plans are modelled and implemented - lessons could be learnt here from current Heat Network Zoning.

37 Energy Systems Catapult, *Local Area Energy Plans*, December 2023

38 Public First, *New Report on Grid Decarbonisation: Hitting the Ground Running*, October 2023

The spark gap: rebalancing the cost of electricity

The UK's ratio of electricity to gas prices, known as the 'spark gap', is among the highest in Europe at 4.1.[39] This maintains a barrier for uptake of electrified heating and prevents clean heat from being part of the solution to fuel poverty, keeping households reliant on gas and the volatile international energy markets. Making the cost of electrified heat cheaper than gas heating should be a top government priority for decarbonising homes, reducing fuel poverty and securing Britain's energy supply.

Over time, as clean power represents a larger share of the energy mix, the lower marginal cost of renewables will help to bring the cost of electricity down. However, policy costs - such as Contracts for Difference (CfDs), Warm Home Discount (WHD), Feed-In Tariffs (FiT), Renewable Obligation Certificates (RO), and Energy Company Obligations (ECO) - currently all sit on electricity bills, where they contribute to artificially higher electricity prices compared to gas. The last government committed to rebalancing energy prices over the course of the 2020s, including shifting energy levies and obligations from electricity to gas bills, but its plans to launch a call for evidence on this have been delayed by nearly two years from 2022 to 2024.[40] Resolving this poses difficult political decisions as to whether electricity is made cheaper at the expense of gas prices increasing, cost to the Exchequer, or some other alternative.

Electricity costs are a barrier. Energy bill savings is what motivates homeowners to install measures (65%), far more so than being environmentally-friendly (31%), or increasing property value (15%). Therefore, a major barrier to decarbonisation is that the public are unconvinced that installing new technologies that use electricity for heating instead of gas is an effective way to reduce the cost of their energy bills (40% very or somewhat effective, 43% slightly or not at all effective).

> *"No [they won't save on their bills] because electricity is more expensive per kilowatt hour by quite a lot. So they're taking a hit on both upfront and monthly with a heat pump"* - Male, aged 25, plumber in a renewables SME, Yorkshire.

The majority (77%) of the public agree that reducing the cost of electricity should be a priority for the government in the next five years, with strong support across all social grades and voting history.

There are various options for incentivising electrified heat, most notably: moving levies to general taxation or onto gas bills, introducing carbon taxes, or introducing a discounted tariff or subsidy for heat pumps. Previous research from Public First published in April 2021 explored options for energy bill reform, concluding that a scenario of moving policy costs onto government expenditure and introducing a carbon tax would most effectively incentivise heat decarbonisation, properly price emissions on gas, not penalise the fuel poor or the average consumer, and limit impact to the Treasury.[41]

Since that report was released, the economic climate following an energy price crisis

39 Nesta, *How the UK compares to the rest of Europe on heat pump uptake,* August 2023

40 NAO, *Decarbonising home heating,* March 2024

41 Public First, *Options for Energy Bill Reform,* April 2021

and a cost of living crisis has constrained both government and household finances to absorb higher costs. Political rhetoric on the cost of net zero also makes introducing carbon taxes on energy bills politically difficult. As a result, policymakers will likely need to introduce incramental measures to reduce policy costs on electricity without significantly increasing government expenditure or the cost of carbon. To do so effectively, decisionmakers must understand who will be most affected by changes to energy bills and by how much, and whether existing mechanisms for bill support are sufficient in mitigating any undue cost increases.

We therefore conducted an updated distributional analysis of the two key options of moving FiT, RO and ECO electricity policy costs to gas bills or general taxation. We use Ofgem's Consumer Archetypes 2024 to inform the debate on *who* is likely to be most negatively impacted and by *how much*. It is beyond the scope of this report to provide a full forecast model. Instead, we reflect current prices but recognise that energy prices are forecast to come down over the parliament[42] and current policy costs are subject to change.[43]

Moving FiT, RO and ECO to general taxation ostensibly has no policy losers and would benefit wealthy homeowners the most. All households would benefit from reduced energy bills under this scenario with an average household seeing a £130 reduction on their energy bill a year. Households with higher electricity consumption would see the biggest reduction (£362 a year) - these households tend to be high-earning homeowners in rural, inefficient homes on oil heating. By comparison, households with lower electricity consumption would see a reduction of around £119 a year - these households tend to be lower-middle income households in energy efficient flats. However, we recognise that increasing taxes or redistributing public funding elsewhere to meet the £5bn a year policy cost could have negative distributional impacts depending on what lever is pulled.

Moving FiT, RO and ECO costs onto gas would increase bills across the income distribution. If policy costs were moved directly onto to gas, 83% of households would see their bills increase by an aggregate total of £1.2bn. A typical dual-fuel household (ie using gas and electricity) would see their energy bills increase by £61 (+3.5%) a year. As shown in Figure 7, 'policy winners' and 'policy losers' are spread across income groups. Households that stand to benefit the most with a £362 (-21.6%) reduction in energy bills are high-earning homeowners. While households that will see the greatest increase in bills (by £83 a year or +3.1%) are also on high incomes. Low income households with electric heating would benefit from reductions of up to £317 (-21%). Meanwhile the poorest households on gas heating would face an extra £50 a year (+2.91%). Policymakers must consider how rebalancing policy costs might impact households of different income groups and on different heating fuels.

42 Cornwall Insight, *Power price projections fall amid high European gas stocks,* April 2024

43 RO and FiT will expire in 2027 and a new hydrogen levy is expected to be implemented in 2025, although details on its implementation are limited.

Figure 7: Impact of moving FiT, RO, and ECO to tax vs gas bills on annual energy bill by Ofgem consumer archetype 2024

Source: Public First analysis of Ofgem 2024. Note: Negative values represent a reduction in annual bills and positive values represent an increase in annual bills.

30% of policy-losing low to middle income households could be missed by mitigating support mechanisms. Based on consumer archetypes, we estimate that 70% of low, lower-middle and middle income households are currently eligible for existing welfare or bill support including state pension, benefits, Winter Fuel Payment, and Warm Home Discount. Therefore, any mechanism that policymakers might consider to offset the impact of moving policy costs to gas, could miss three in ten households on middle and lower incomes. This highlights the need, again, to implement data-matching between HMRC and energy suppliers for improved targeting as recommended by Public First and Social Market Foundation for Citizens Advice in 2023.[44] The government must prioritise a one-year sprint on data-matching to enable a new targeted bill support measure, helping to reduce search costs for vulnerable households that may also be eligible for retrofit.

The public have a preference for moving the levy (52%), but there is no clear consensus on where it should move to. Only 18% of the public support the costs remaining on electricity bills. The public are split on where it should be moved, between general taxation (32%) and gas bills (30%) and a large proportion of the public are unsure (30% Don't Know). This preference is fairly constant across all income brackets, although those with a lower income tend to be less supportive of moving it on to general taxation and more unsure of where it should go.

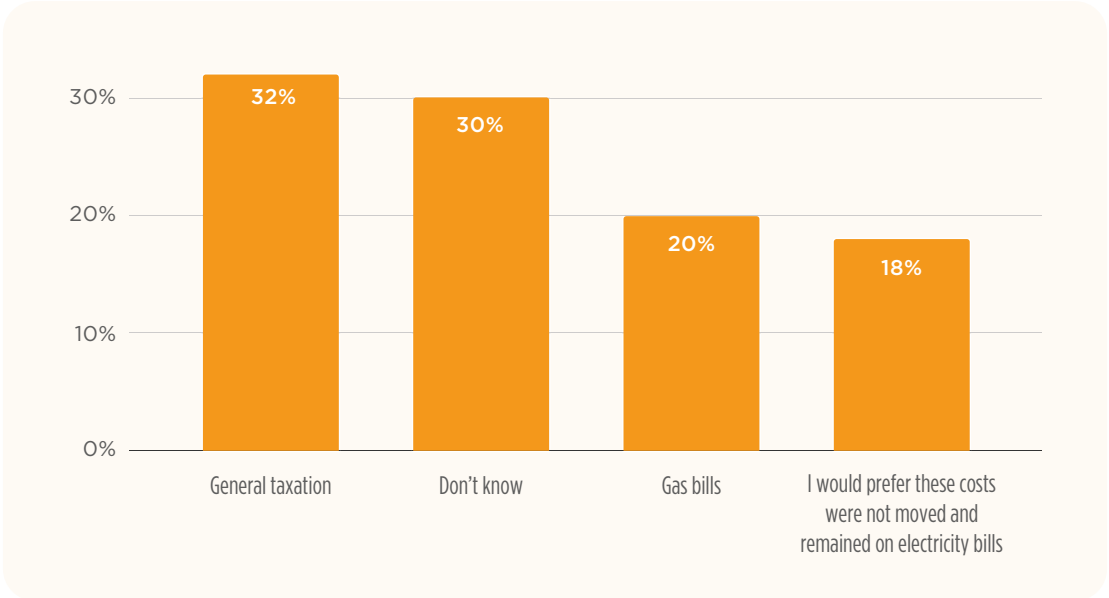
44 Social Market Foundation, *Future of Energy Bills,* March 2023

Policy costs and energy prices are likely to be cheaper from mid-parliament. RO and FiT, which currently cost £106 a year for a typical household's energy bill, will ramp down from the end of March 2027. Power prices are also expected to fall later this parliament - although this is subject to future geopolitical shocks.[45] Under the current trend, it is likely that this government will benefit from the political win of falling electricity prices by the end of this parliament. However, with the price cap due to increase this October, policymakers must also concentrate on enabling households to also reduce their overall energy demand.[46]

In the interim, there are three key actions that the government must take to address the imbalance of prices.

1. Launch the DESNZ consultation on rebalancing energy prices, which is already two years late.
2. Explore the distributional impact of proposed interim measures, such as heat pump tariffs and phased rebalancing of policy costs, and how mitigation proposals such as a social tariff will offset any negative implications on vulnerable households.
3. Consider how measures to reduce electricity demand as well as consumption from home heating will also affect future electricity bill levels.
4. Ensure that the new hydrogen levy does not add to the cost burden on electricity.

Figure 8: The public have a preference for moving the levy, but are split on where it should go



Survey question: One of the reasons why electricity is more expensive than gas is because households pay an average of £120 per year in environmental taxes on their electricity. If the government were to remove the environmental taxes on electricity, would you rather these taxes be moved to gas bills or general taxation?

45 Cornwall Insight, *Great Britain Power Market Outlook to 2030*, January 2024

46 Cornwall Insight, '*Price cap forecasts fall ahead of election*', June 2024

Reform Energy Performance Certificates (EPCs)

EPCs should be a critical tool for decarbonising homes, but currently they are not up to the task. EPCs are meant to provide an assessment of a home's energy efficiency through A-G bandings (where A is the most efficient) and offer households recommendations on what measures would improve the property's performance. They are used as the primary tool for driving and monitoring energy efficiency policy - for example, the fuel poverty target to upgrade as many homes as possible to EPC C by 2030, or ECO4 delivery criteria that treated homes should be improved by two EPC bandings (ie from EPC E to C).

However, only 60% of homes even have an EPC, and the metrics within the assessment are not suitable for capturing the actual performance of the property nor incentivising clean-heat.[47] While UK and Scottish governments have committed to reviewing EPCs, it is critical that the government takes decisive action within the parliament to implement a new methodology. This requires less political capital to implement than other policies required for the future of clean heat. However, not doing so presents far greater political risk - the risk that a new Labour government expends time and public funding this parliament into creating a policy environment that measures and aims for the wrong technical solutions and incentivises behaviours that does not sufficiently reduce carbon. This could undermine both market and consumer confidence in getting to net zero if households feel misled by policy.

EPC metrics face the following issues:

- **EPCs do not directly measure energy efficiency.** While EPC bandings are used as a proxy for efficiency, the two key metrics measure the cost of energy per square meter per year (Energy Efficiency Rating) and the estimated greenhouse gas emissions per square meter per year (Environmental Impact Rating). Neither of these are direct measures of energy efficiency performance, and are impacted by fuel type and consumption.
- **EPCs do not incentivise fabric efficiency.** The cheapest and easiest way to improve a home's Energy Efficiency Rating is often to fit a more efficient fossil fuel boiler (which reduces fuel consumption) or install solar PV (which reduces or offsets electricity consumption). These measures will reduce energy bills but will not deliver the improved fabric efficiency needed to enable low carbon heating over the longer term.
- **EPCs do not incentivise clean heat.** As the Energy Efficiency Rating is actually a cost of energy measure, electric heating options can result in a worse EPC rating. This is because the cost of electricity costs more per unit than gas. Additionally, the Environmental Impact Rating does not provide a clear picture on future property emissions. Despite an EPC lasting 10 years, its methodology is not future-proof. Although the carbon-intensity of electricity is expected to fall this decade, this is not considered in emissions metrics.

The government should ensure EPCs use outcome-based metrics. EPCs should reflect the real performance of the property by using outcome-based metrics such as the property's actual performance and energy use, climate impact and energy

47 CCC, *Reform of domestic EPC rating metrics to support delivery of Net Zero*, February 2023

cost. These metrics would more accurately assess the energy efficiency of a property while also incentivising clean heat, as also recommended by the Energy Systems Catapult.[48]

New homes are still being built to carbon-intensive Building Regulations. While this report is focused on existing homes, the Future Homes Standard (FHS) is critical to building supply chains and skills and driving down the cost of installation that will benefit existing homes as well as ensuring no more new homes have to be retrofitted. But FHS has yet to be implemented. The government must ensure that this standard is swiftly introduced.

Minimum efficiency standards for the private rented sector

Two in three private renters (2.7 million households) in England are currently living in poorly insulated homes with limited control over their living standards and energy bills.[49] Despite setting out an ambition in 2017 to raise minimum energy efficiency standards (MEES) in the sector from EPC E to C, the previous government failed to implement this policy or even respond to the consultation in 2020, succumbing to political opposition from landlords. The new Labour government's 2024 manifesto committed to *"ensure homes in the private rented sector meet minimum energy efficiency standards by 2030"*

Research by Public First in 2023 found that 44% of landlords who knowingly do not meet EPC C standards said they would probably sell the property rather than carry out the works needed to comply with upgraded minimum efficiency standards.[50] Understandably, the threat of landlords selling their properties raises concerns about the impact on private renters, particularly low-income households that rent in the private sector due to a lack of available social housing. This makes implementing higher minimum energy efficiency standards in the private rented sector politically difficult for the Labour government as well.

Policymakers must therefore reduce barriers for landlords to upgrade their homes, as well as homeowners more generally. While the challenges they face are not dissimilar to owner-occupiers, instead of weighing up the cost-benefit of bill savings, landlords are more interested in returns on house value or rental income:

- **Landlords are unaware of property EPC ratings and upgrade costs.** Around a fifth of the 508 landlords surveyed in 2023 (21%) didn't know their EPC rating, and of those with a property rating below EPC C, 88% had not received a quote for the cost of bringing the home to EPC C.
- **Reluctance to use private finance.** Landlords, like owner-occupiers, have a strong preference for using personal savings or income to make upgrades rather than private finance, which may explain why they report cost barriers.

48 Energy Systems Catapult, Making Energy Performance Certificates Work for Net Zero, October 2021
49 UK Government, *English Housing Survey*, December 2022
50 British Gas, *Greening the Private Rental Sector*, November 2023

When specifically asked if they would consider a private finance option to fund environmental improvements in their home, 29% of landlords stated they would definitely not consider this, and only 7% said that they definitely would.

- **Landlords are unconvinced of the benefit to property or rental value.** The financial return on improvements is a strong motivator for landlords, yet our poll found that landlords are unconvinced that environmental improvements will bring about an increase in property or rental value. This is particularly the case for low-carbon technologies like heat pumps or solar panels. Over half (54%) of landlords think environmental improvements tend not to be worth the costs, and one in five landlords (21%) report they do not know. By comparison, Public First's poll for the Home Upgrade Commission found that 40% of renters in the private rental market would be willing to pay higher rent for a home that had good energy efficiency. Although 28% of renters would be unwilling to pay more, there is net positive demand of +13%.
- **Landlords don't expect tenants to pay, but a third think tenants should help organise and oversee the installation.** Landlords either think it is the landlord's responsibility alone (31%) to help organise and oversee the installation or shared between the landlord and government (28%). There are mixed opinions on whether the tenant has any responsibility for organising and overseeing installation. A third of landlords expect the tenant to have a shared responsibility (33%) while over half (51%) expect them to have no involvement.

Alongside implementing policy, the new government should also play an active role as a key communicator to explain the value of retrofit to homeowners. Although the evidence-base is nascent, research is starting to show that energy efficient homes do see financial returns.

Analysis from Knight Frank finds that homes which had moved from an EPC rating of D to C added an additional 3% to their value over and above local house price growth – this is equivalent to just over £9,000 in additional value based on the average resale value.[51] Their analysis shows that moving from band E to C saw an uplift of nearly 9% or an equivalent to over £29,000. Individual low-carbon technologies are also achieving premiums. Research carried out by the WWF shows that a heat pump could add 1.7%-3% (£4,500-£8,000) and solar panels 0.5-2% (£1,350-£5,400) to the value of a home.[52] However, landlords and homeowners alike do not expect they would receive a 'green premium'.

Alongside creating a market for low-carbon heat, the new government must work with surveyors to ensure that evidence of efficiency premiums are reflected in house prices and rental values, and that those gains are communicated effectively to homeowners (and landlords).

51 Knight Frank, *Improving your EPC rating could increase your home's value by up to 20%,* October 2022

52 WWF, *Better Home, Cooler Planet,* July 2022

In the meantime, the new government must publish the long-awaited consultation response on minimum efficiency standards in the private rented sector with updated secondary legislation to implement new standards ahead of 2030. Policymakers should take early action on this during the parliament, to allow for enough time to build the necessary enforcement mechanisms, and for landlords to prepare for meeting the new standards.

Permitted development rules on heat pumps

Currently, due to permitted development rules, homeowners would need to submit a planning application to install a heat pump within 1 metre of their home. This adds friction to the consumer journey and risks undermining uptake. Changing these rules requires secondary legislation, which should be implemented by the Secretary of State within the first year of the parliament.

2.2 Recommendations

The previous government made decarbonising heat harder for a new Labour government by creating an inconsistent policy environment and using antagonistic political rhetoric about the costs of net zero. The incoming government must take decisive action during this parliament to signal certainty and help build a market for clean heat. Only then, in conjunction with clear communication and an enforceable consumer protection framework [Part 2.1], can any government announce legislation to phase-out new gas boilers from 2035.

The future of home heating

- Establish plans to bring forward the decision on hydrogen for heating.
- Lay the Statutory Instrument for implementing the Clean Heat Market Mechanism by April 2025.
- Lay the Statutory Instrument for the Future Homes Standard within Building Regulations for 2025.
- Develop a market for clean heat alternatives to air source heat pumps by including ambient loops and shared ground loops in future network zoning and the LAEP methodology.
- Provide identified local authorities with funding to support the rollout of Local Area Energy Plans (LAEPs) with oversight from Regional Energy System Planner.
- Consult on and implement a standardised methodology for LAEPs by the end of 2027.
- Update permitted development secondary legislation to allow heat pumps to be installed closer than 1m to the home.

Reduce the spark gap to incentivise electrified heat

- Launch the delayed consultation on rebalancing electricity levies by the end of 2024 with a specific call for evidence on interim solutions and their distributional impact. Additionally, review holistically all key factors affecting future electricity bill levels, including measures to reduce electricity demand and consumption from home heating.
- Ensure any new levies (such as for hydrogen) are not added to electricity policy costs.

Reforming EPCs

- Review unpublished 2021 consultation response on EPC reform with a decision to publish it or launch a short follow-up consultation on real performance metrics and clean heat incentives.

Implementing Minimum Efficiency Standards in the private rented sector

- Update secondary legislation for minimum energy efficiency standards for the private rented sector to be implemented from 2030 and establish plans for an enforcement framework.
- Work with surveyors to grow the evidence-base that energy efficient homes attract a premium, and communicate the findings to landlords through targeted marketing. [Options for financial incentive are explored in Part 2.4.]

Part 2.3

Improve The Performance Of Existing Schemes For Households In Need

Over

£415m

dedicated to retrofit schemes was returned to the Exchequer since 2020.

75%

of the Home Upgrade Grant (HUG) failed to deliver its funding in its first round.

72 *Years*

is the time it will take to achieve our 2030 fuel poverty target at current delivery rates.

2.3 Improve the performance of existing schemes for households in need

The new government will inherit numerous schemes targeted at improving the energy efficiency of homes for the fuel poor, social renters and low-income households - including a new Local Authority Retrofit Scheme as well as the Home Upgrade Scheme, Social Housing Decarbonisation Scheme, Energy Company Obligation, and the Great British Insulation Scheme. The previous government already allocated £2.5bn of public funding in England and £2.8bn of supplier obligation in GB across these schemes until 2028.[53] **Our research finds that many have underperformed, with hundreds of millions returned in underspend to the Exchequer since 2020.**

Delivering funding schemes includes various stakeholders, such as central government, devolved and local authorities as well as housing associations, energy suppliers, and procured contractors. Representatives from these groups highlighted challenges with 'getting money out of the door' and delivering on recent and existing funding schemes due to 'over-engineered complexity'. **The government must ensure that in future the design of funding schemes is practically deliverable so that allocated funding is spent on the households that need it most.**

This section focuses on local authority-led schemes and energy supplier obligations, as this is where stakeholders raised most concerns. As energy efficiency and fuel poverty are devolved, the schemes covered in this section operate in England, except for supplier obligations which cover Britain.

Local authority-led schemes

Local authorities must be involved in addressing fuel poverty and the quality of local homes: they know their constituents, housing stock, and local supply chains. In theory, local authorities are well placed to support the identification of need and routes to market for procuring home upgrades. In practice, local authority-led delivery has suffered from low rates of uptake and an inconsistent landscape of delivery across different areas of the country.

Our research with local and combined authority representatives and delivery partners identified four key issues within the design of publicly-funded schemes that contribute to this disparity:

1. **A competitive bidding system**, where authorities receive no funding if their applications are unsuccessful, despite investing time and resource into submitting proposals. This contributes to a postcode lottery of delivery and reduces the time-frame that councils have to deliver measures within the

53 SHDF, HUG2, and the Local Authority Retrofit Scheme, ECO4 and GBIS allocated within 2024/25-2027/28

funding cycle. Currently, the batch system used under HUG2 disregards an entire application if the average score across all homes in the batch does not meet certain criteria, despite it including many eligible and in-need homes.

2. **Short term windows to deliver the scheme before it is returned to the Treasury.** Short term funding cycles (one to two year schemes) create a difficult environment for councils to build capacity for delivery, which is exacerbated by competitive bidding systems that eat into delivery time and reduce the certainty of future funding rounds.

3. **Arbitrary eligibility criterias and unrealistic cost caps.** Stringent eligibility criteria for households and measures is viewed as impractical by local government representatives. Cost caps do not reflect inflation in construction costs, making projects undeliverable without local authorities absorbing extra costs. Additionally, eligibility for fuel poverty was described by one council worker as *"over-engineered and made with no understanding of delivery",* leading to very high search costs and vulnerable households missing out on support.

> *"Perfect is the enemy of good. A little bit of inefficiency would unlock delivery"* - Local authority.

4. **Under-resourced local authorities.** The economic constraints on many local authorities mean that many lack capacity to overcome issues of competitive bidding, short-term funding cycles, and stringent eligibility criteria. The current design of schemes prevents councils from developing in-house skills and increasing staff to apply for funding and manage their supply chain procurement process.

Put together, these issues have led to over £415m in unspent funds from local authority-led schemes being returned to the Exchequer since 2020 (see Figure 9).[54] Using average costs, this could have upgraded all homes in Gateshead to EPC C.[55]

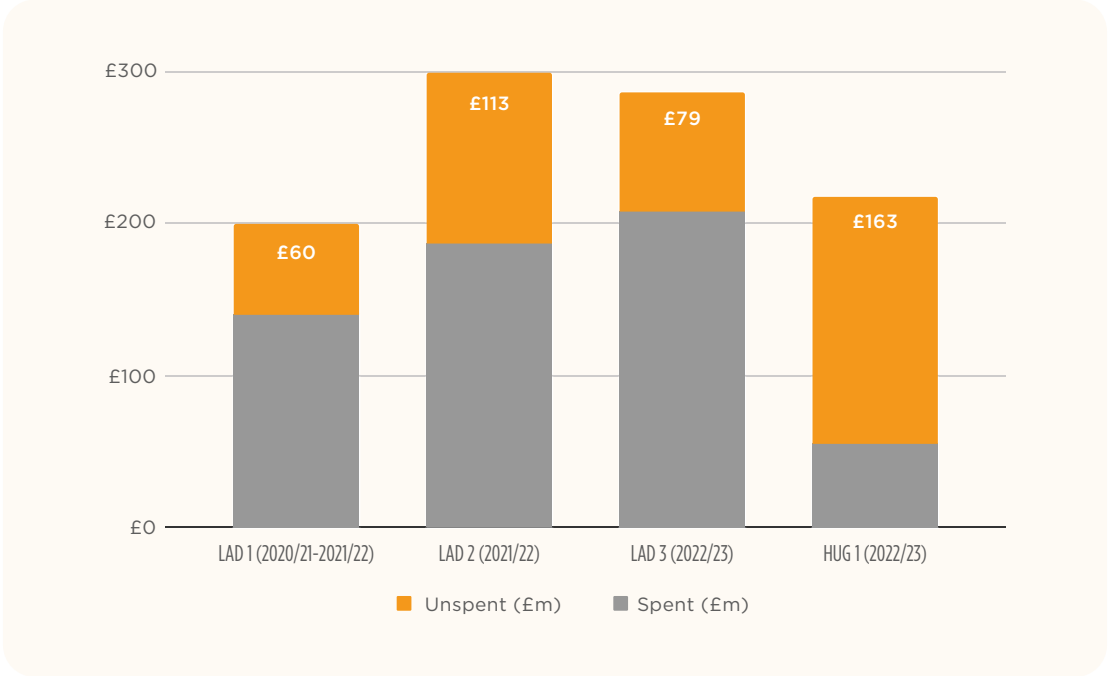
The OBR recognises that capital budgets are almost always underspent - the current outlook for overall capital underspend in 2023/24 is 5.7%.[56] By comparison, these schemes averaged 42.6% underspend - over seven times as much. The Home Upgrade Grant (HUG) was particularly liable, failing to deliver 75% of its funding in its first round. Reports from stakeholders indicate that the underspend rate could be even higher for the second phase (HUG2). Eligibility criteria are an important mechanism to ensure that funding goes to the households that most require support but when the overall policy trajectory means that a vast majority of homes will be treated - many with government support - over the next decade, this level of stringency is counterproductive. Given the scale of the challenge, getting money out of the door is far more important than total accuracy.

54 Public First analysis of estimated underspend for LAD1, LAD2, LAD3 and HUG 1 in nominal terms.

55 Public First analysis based on English Housing Survey estimated costs per tenure 2021/22.

56 Office for Budget responsibility, *Economic and fiscal outlook,* March 2020

Figure 9: Budget allocated vs estimated spend of recently ended funding schemes (£m, nominal)



Source: Public First analysis of DESNZ Green Homes Grant and Home Upgrade Grant statistics, June 2024.

The new Local Authority Retrofit Scheme (LARS) must support councils through long-term, challenge funding and uprated cost caps. The last Conservative government allocated £500m to a new scheme, the Local Authority Retrofit Scheme (LARS), launching in April 2025 to run until 2028. It is expected that this new scheme will replace and combine the historic LAD and HUG schemes for upgrading fuel poor and low-income homes with energy-efficiency and clean heat measures. The new government must get to work quickly on establishing the design of this scheme and whether it will receive any further funding from the unallocated £6.6bn set out in the Labour government's 2024 manifesto. Policymakers should ensure that the design includes:

- **10-year funding settlement:** While the three-year funding cycle is an improvement upon historic one and two-year schemes, the LARS should have a longer-term funding settlement to provide certainty for local authorities to invest in skills and capacity. The funding settlement should last 10 years, in line with the Social Housing Decarbonisation Fund settlement implemented by the previous government. Looking ahead, the government should look to devolve this budget to combined authorities, once sufficient capacity is developed and a funding method has been consulted upon.[57]
- **Challenge funding applications:** Competitive bidding undermines and

57 MHCLG is trialling devolved funding for energy efficiency grants. It recently awarded £140m of devolved capital funding to the West Midlands region for energy efficiency, awarded to a consortium of local authorities represented by the Midlands Net Zero Hub.

exacerbates capacity issues. Policymakers should instead consider that the LARS implements a challenge model, favoured by local authorities, which allows for a round of feedback before resubmitting applications and a guarantee of some level of funding, if not the whole application. While this may extend the application duration, longer funding cycles would mitigate the impact this has on delivery.

- **Address stringent criteria by uprating cost caps and expanding household eligibility:** Eligibility criteria for LARS should include uprated cost caps, in line with construction inflation, and greater flexibility for councils to identify in-need, low-income households that may not fit the fuel poverty definition. Household eligibility should also overlap enough with supplier obligations to enable collaboration and partnership across councils and suppliers in delivering existing Flex routes. To support better targeting of vulnerable households in future and reduce search costs, the government should prioritise a one-year sprint on data-matching between central government departments, local government and energy suppliers.[58]

- **LARS should enable consortia application approaches across local authorities.** Consortia approaches can be a highly effective way to pool resources for sharing best practice, submitting joint funding applications and procuring contractors - as seen in the current Social Housing Decarbonisation Fund scheme. Some local authorities are already entering consortia bids. For example, the West Midlands Net Zero hub has successfully bid for £140 million of devolved funding, of which West Midlands Combined Authority will receive £34 million for area-based retrofit.[59] Whilst some Net Zero hubs have been successful at bidding for grants and developing procurement frameworks, the model is unlikely to be practical everywhere. Net Zero hubs span a huge geography and can be too big to be effective: the South England hub, for example, spans 42 councils. In these cases, local authorities would benefit from being incentivised to work collaboratively at a sub-regional level.

Supplier obligations

The energy supplier obligation (ECO) has been a long-standing feature in efforts to improve energy efficiency and reduce fuel poverty across Great Britain. ECO, established in 2013, and its recently-launched sister scheme, the Great British Insulation Scheme (GBIS), will collectively will provide an additional £5bn in private funding for installing energy efficiency measures from 2022 to 2026. **Given the fiscal constraints on government, it is critical that supplier obligations contribute towards statutory targets this parliament.** This investment can be made more effective by making the following changes swiftly:

- **Near term action - relax stringent eligibility criteria for ECO4**

58 Social Market Foundation, *Fairer, warmer, cheaper*, March 2023

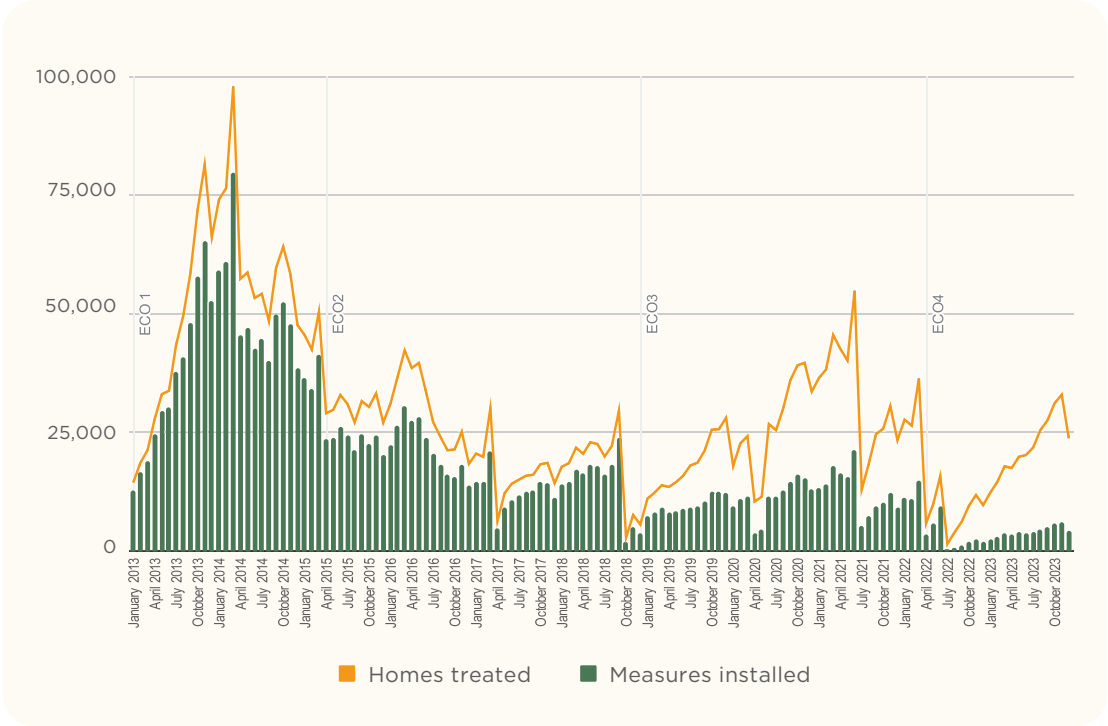
59 West Midlands Combined Authority, *£70m of new funding to improve energy efficiency of thousands more homes,* March 2023

- **From 2026 - combine and extend supplier obligations (ECO and GBIS)** with a long-term settlement, designed to provide cost-effective upgrades that will cut bills and carbon emissions for low-income households.

Improve the effectiveness of ECO4

While the obligation has proved successful in upgrading 2.5 million homes since 2013, strict eligibility criteria set by Whitehall for the latest iteration (ECO4) means that fewer homes are now treated. In 2021/22, 4.5 times as many homes were upgraded under ECO3 (144,000) than in 2022/23 under ECO4 (32,000).[60] Analysis suggests that at this current delivery rate, alongside other existing policies, it would take 72 years to achieve the 2030 fuel poverty target.[61]

Figure 10: Measures installed and homes treated throughout ECO



Source: DESNZ, Household Energy Efficiency Statistics, April 2024

The drop in delivery rates is primarily due to the change in eligibility criteria between ECO3 and ECO4.

- **Minimum Requirements:** Homes treated under ECO4 must achieve a two-band jump in EPC ratings (ie from E to C) as a minimum requirement. This means delivering deeper, whole-house upgrades to fewer homes, which could include loft and wall insulation, windows and doors, and heating improvements. Analysis finds that investment per home in ECO4 is 640% higher than ECO3, up from £3,500 per home to an average of £26,000 per home.[62] As a result, older, bigger, off-gas grid properties are most likely to be

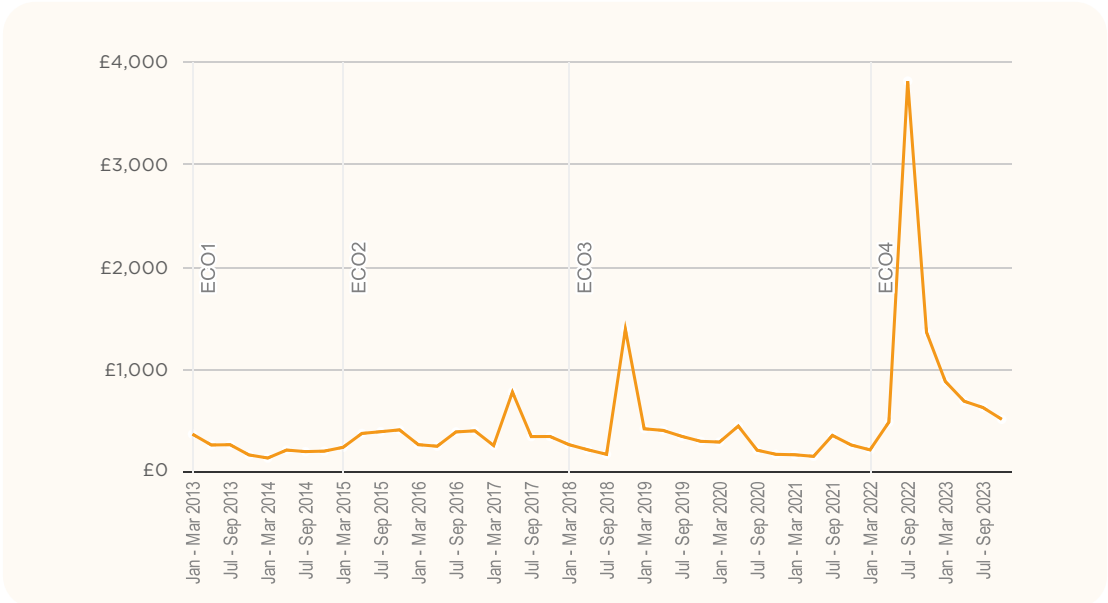
60 DESNZ, *Household Energy Efficiency Statistics, April 2024*
61 E3G, *The future of the Energy Company Obligation, March 2024*
62 E3G, *The future of the Energy Company Obligation, March 2024*

targeted to reach the minimum requirements. This comes in response to ECO3 which prioritised 'low hanging fruit' insulation in easier-to-treat homes. Energy supplier stakeholders explained that this *property* criteria has contributed to the increase in administrative costs to find eligible households, more so than the *household* criteria (see Figure 11). On average, administrative costs per household treated under ECO4 are three times higher than under ECO3, up from around £350 to £1,080 (2023 prices).[63] In Q4 2023, administration costs came to around £520 per household. This in part due to the increase in search costs, as well as compliance costs to improve quality.

- **Household eligibility:** ECO4 is designed to target fuel poor households, although in practice stakeholders noted that this is a narrow definition that misses many households that require support. Currently, households must be part of the Help to Heat Group (i.e. be in receipt of certain benefits) or live in social housing. There is a degree of flexibility as part of ECO Flex for local authorities to identify eligible households at their own discretion, however many local authorities are unable to participate due to limited capacity.

From April 2025, policymakers should relax stringent ECO eligibility requirements, including removing the Minimum Requirement for a two EPC-band jump. In the short-term, this can support improving the deliverability of the scheme and expanding the reach of the scheme to benefit more fuel poor and low-income homes. The government should also prioritise a one-year sprint on data-matching between central government departments, local government and energy suppliers to better support targeting of vulnerable households in future and reduce search costs.[64]

Figure 11: Administrative costs per home treated (£, real terms, 2023 prices)



Source: DESNZ, Household Energy Efficiency Statistics, April 2024

63 Public First analysis of DESNZ, *Household Energy Efficiency Statistics*, April 2024

64 SMF, *Fairer, warmer, cheaper*, March 2023

Policymakers should monitor the rollout of GBIS to learn lessons on household eligibility and customer contributions. GBIS launched in 2023 in response to the energy crisis and is focused on reaching more homes with broader household eligibility and single measures, but with a much smaller pot of funding. The key features of GBIS are:

- **Funding**: Where ECO4 delivers around £1.1bn a year, GBIS will deliver less than £1bn over three years.
- **Depth of retrofit:** In some ways, GBIS reflects the previous iteration of ECO (ECO3) in that it provides shallower retrofit per home. GBIS only provides single measures per household and has focused primarily on insulation and heating controls. As noted above, ECO4 provides much deeper retrofit per household.
- **Household eligibility**: GBIS household eligibility comprises a broader group than either ECO schemes. GBIS is available to low-income households on benefits (like ECO) as well as homes in council tax bands A-D (in England, or A to E in Scotland and Wales). A Flex route also exists for local authorities to put households forward for support (like ECO).
- **Consumer contributions:** DESNZ's modelling for GBIS assumed a contribution of £80m from households (8% of total funding), however supplier stakeholders explained that currently there is no mechanism by which suppliers can collect this. Policymakers should review this with suppliers to explore mechanisms for customer contributions in future.

The single measures approach meant that GBIS got off to a slow start. We estimate that in its first three quarters, its delivery rate was around 5%. Suppliers explained that this was primarily due to the supply chain - contractors had shifted their business models towards deeper whole-home retrofit in response to the ECO4 minimum requirements. As a result, the supply chain for single measures was underdeveloped and took time to rebuild. Reports from suppliers indicate that the scheme is working better now and they expect its effectiveness to improve. To prevent disrupting this supply chain further, GBIS should continue as designed for its planned duration. **From 2026, supplier obligation schemes should work better together so as not to cannibalise the supply chain for one model** - homes will require a range of technical solutions and schemes should be designed to enable flexibility that builds the supply chain for various depths of retrofit.

When combining supplier obligations, policymakers should consider ensuring the new scheme incentivises upgrades that are suitable for bill and carbon savings.

- **Cost-effectiveness of single measures:** While ECO4's two-band EPC jump has reduced deliverability, its approach to incentivise multi-measure retrofits is sensible. Evidence from DESNZ indicates that multi-measure retrofits can have greater potential for energy savings than single measures.[65] Uncertainty remains about how combinations of single measures interact. The current practice of single measure approaches could make it more difficult to embed

65 UK Government, *Demonstration of Energy Efficiency Potential: Literature review,* February 2021

whole-home approaches later on.[66] Policymakers should aim for an outcome-based approach to reduce space heating demand which enables cost-effective multi-measure approaches - this is explored as part of EPC reform in Part 2.2.

- **Excludes electric-based solutions:** The list of eligible measures for GBIS currently excludes heat pumps, solar PV and battery storage. These solutions will also cut energy bills in many homes, and even more so when combined with insulation upgrades. Additionally, prioritising the replacement of electric night storage heaters with heat pumps in low-income and social housing would enable significant bill savings in many homes. Future supplier obligation rounds should ensure that the list of measures includes the broad range of measures that can cut bills and carbon.

The council tax approach to household eligibility should be monitored. Valuations for council tax bandings are outdated and do not accurately reflect a current picture of household income levels. However, we also recognise that there are currently few better options for targeting low-income households outside of the benefits system. Previous work from Public First and the Social Market Foundation highlighted how better data matching could improve government targeting for a social tariff, which could also be applied to energy efficiency schemes.[67] E3G also highlighted how smart meter data could provide suppliers with more accurate data on household efficiency - this is dependent on increasing the rollout of smart meters beyond the current installation rate of 60%, ensuring those that are installed work correctly, and careful considerations on data-sharing and privacy.[68] Despite the recent energy price crisis, no progress has been made on targeting. The new government should implement better data-matching for improved targeting of schemes in future. **In the meantime, GBIS should be monitored to measure the distributional impact of the policy by capturing and reporting data on the household income of treated homes. If successful, council band targeting should be considered for future policies.**

Customer contributions should also be monitored. In future, delivering at scale across tenures and income levels, either through supplier obligations or through local authority area-based approaches, will likely require a level of customer contribution for wider 'able to pay' households. While contributions were considered in DESNZ modelling, there has been limited progress on how this might be collected by suppliers. Policymakers should review this with suppliers to explore mechanisms for customer contributions in future.

From 2026, supplier obligation schemes should be combined and extended to provide cost-effective upgrades that will cut bills and carbon emissions for low-income households. In order to ensure schemes are complementary and not distorting the supply chain, policymakers should look to combine ECO and GBIS into one supplier obligation from 2025/26 when the current ones end. Given the importance of this funding and delivery mechanism, the new obligation should be extended with a long-term settlement. The new supplier obligation should deliver

66 UK Government, *Demonstration of Energy Efficiency Potential: Literature review,* February 2021

67 Social Market Foundation, *Future of Energy Bills,* March 2023

68 E3G, *The future of the Energy Company Obligation, March 2024*

the best combination of fabric and heat measures that will be cost-effective per household and achieve energy bill and carbon savings. This should include a range of measures for insulation, solar PV and batteries, and heat pumps. For many fuel poor homes paying high energy bills due to electric night storage heaters, schemes should consider replacing these units with heat pumps to cut bills and improve energy efficiency.

The household eligibility criteria should aim to be more practically deliverable than the current ECO4 scheme to treat homes for fuel poor and a broader group of low-income households. What this looks like will depend on the results of the one-year data sprint to better target vulnerable households and the lessons learnt from GBIS council tax band approach. There should be enough overlap with the local authority retrofit scheme to enable collaboration between suppliers and councils through Flex.

2.3 Recommendations

Hundreds of millions of pounds has been returned to the Exchequer rather than spent upgrading the homes of the most vulnerable. The government must address the stringent eligibility criteria of supplier obligations and boost local authority capacity now to support more effective delivery in future.

Supporting local authorities and continuing to deliver for social housing

- Set out how much funding existing local authority and social housing schemes will receive from the unallocated £6.6bn funding pot.
    - Establish plans for the new Local Authority Retrofit Scheme, including:
    - A 10 year funding settlement, similar to the social housing settlement.
    - Challenge funding applications instead of the current competitive bidding approach.
    - Uprated cost caps in line with construction inflation and expanded household eligibility to cover fuel poor and low-income households.
    - Enable a consortia approach for sub-regional support on procurement frameworks, improved data-sharing, and skills planning, learning lessons from SHDF.
- Consult on a methodology for devolved funding settlements for local authorities in future.

Broaden the benefits of supplier obligation

- Quickly consult on removing requirements for a 2-band EPC jump for ECO4 from 2025/26
- Review the future of supplier obligation from 2026 onwards to bring ECO and GBIS into one scheme to provide cost-effective upgrades that will cut bills and carbon emissions for fuel poor and a broader group of low-income households. This should include:
    - Fabric measures as well as solar PV, batteries, and clean heat (with considerations for replacing electric night storages with heat pumps for fuel poor homes)
- Review of the mechanism for suppliers to collect customer contributions through GBIS to learn lessons for future co-contributitory schemes.

Improving targeting over the long term

- Launch a one-year sprint on data-matching between central government departments, local government and energy suppliers.

Part 2.4

Prime the market to unlock private finance

Just **3.5%**

of heat pump installations in English homes were privately funded in full in 2023.

68%

of the public think that the energy efficiency of a property should be reflected in the property's value.

Over

1 in 5

(23%) would be likely to buy a home that has already been upgraded and has property-linked finance.

2.4 Prime the market to unlock private finance

Cost is the biggest barrier to making homes more efficient, for both households and the government. Given CCC estimates of at least £46bn of investment needed to retrofit UK homes this parliament, it is not viable for the government to fully fund upgrades for all homes to 2030, let alone to 2050. Private finance will therefore play a critical role not only to support households in meeting upfront costs, but to drive innovation and bring costs down across the market.

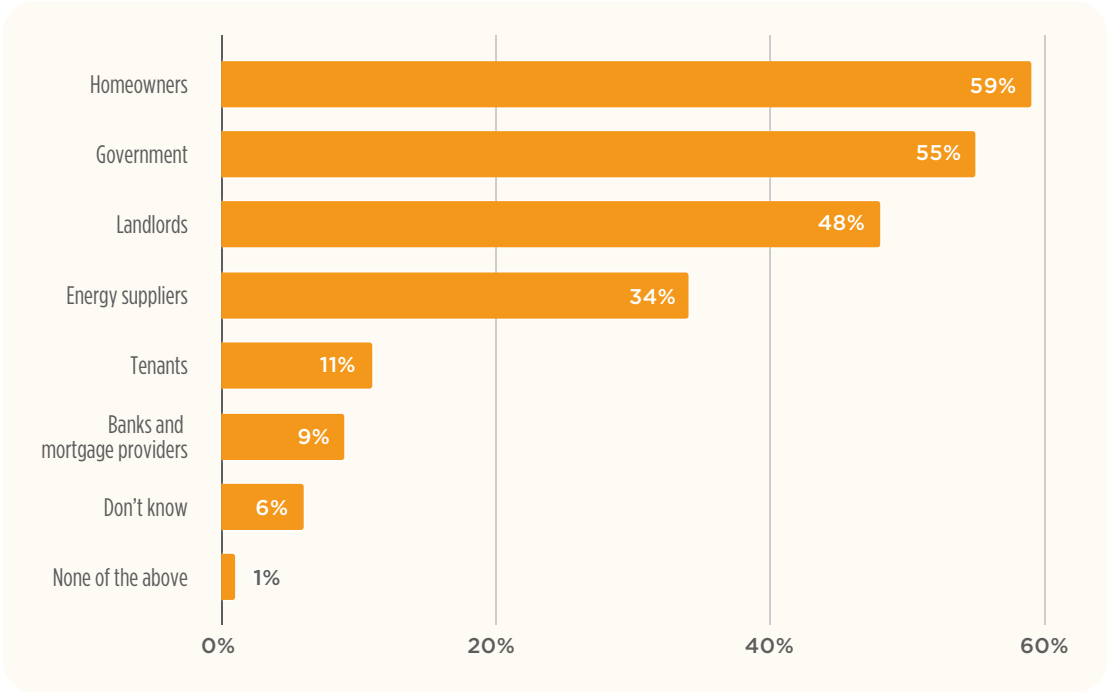
At present, inconsistency in policy and communications around home decarbonisation has resulted in the market being at best nascent, lacking robust supply chains or an appropriately skilled workforce. Given the scale of the challenge and the pace with which it must be met, the new government will need to pump-prime the home retrofit market, allocating public funding to boost uptake of electrification technologies, financial products and home insulation measures, as well as communicating the value of energy efficient homes to homeowners.

'Able to pay' households need *help* to pay. There is a tendency across the sector to refer to a proportion of households as 'able to pay'. While it has no official definition, many use it to describe homeowners that are not (or should not be) eligible for fully-funded upgrades - i.e. they are not fuel poor or on low-incomes, which is defined as benefit claimants under most existing energy efficiency schemes [see Part 2.3]. In line with this, six in ten households in England would be considered 'able to pay'.

While a majority of the public (59%) think that homeowners are most responsible for paying for upgrades (see Figure 12), Public First polling finds that many homeowners currently have low financial bandwidth to deal with additional costs (see Figure 13). Two in ten (20%) homeowners would find it difficult to make an emergency payment of £500, rising to 50% for £5,000. By comparison, upgrades can range from a few thousand to over £20,000 depending on the home.

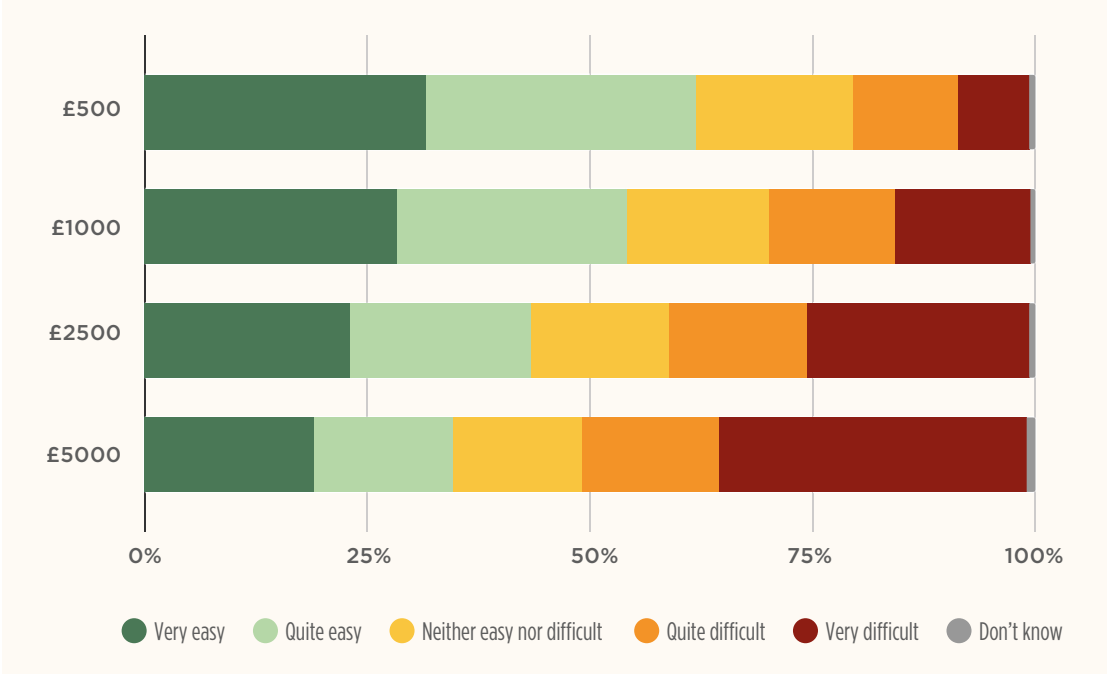
'Able to pay' as a term fails to take account of these nuances, such as with asset-rich, cash-poor homes. For example, 49% of mortgage-holding homeowners said they cannot afford upfront costs of more insulation compared to 29% of those that own their home outright. This is in part due to the cost-of-living crisis where mortgage holders saw high interest rates on their repayments from 2022. It is critical that households are supported in meeting the upfront costs of retrofit by government and banks working together. It is also critical that as the market grows, the range of available financial products reflects differences among homeowners' financial circumstances and tenure.

Figure 12: Who is responsible for paying for energy efficiency and low-carbon heat upgrades?



Whose responsibility do you think it is to pay for improvements to UK homes' energy efficiency, such as insulation and low-carbon heating? Select all that apply

Figure 13: Proportion of homeowners who could afford an emergency payment



Source: Public First polling. Polling question: "How easy or difficult would it be for you to find £500/1,000/2,500/5,000 to deal with an emergency in your life? This might be to pay for something like urgent home or car repairs, or to deal with a health problem etc."

What are private finance models for retrofit and who are they meant for?

There are four key delivery models for funding retrofit.

1. **Public-sector models** tend to focus on social housing or fuel poor homes. This model incorporates several funding mechanisms but is primarily grant-based public funding which can be topped up by housing associations and other social housing providers. The UK Infrastructure Bank (UKIB) is also looking at direct lending opportunities for housing associations to combine low-cost public sector finance with the private sector. The Boiler Upgrade Scheme (BUS) is an example of a public-sector model that provides grant funding directly to private households not in the social housing sector.
2. **Community-led models** use bespoke financing (such as community energy funds or community municipal bonds) blended with public funding to invest in local retrofit. These projects can range in scale and are geographically-specific.
3. **Market-based models** use approaches such as on-bill financing and repayment, but may also incorporate public sector extension of credit-lines to retail banks or revolving funds. They aim to provide new and low-interest financing options for individual homeowners to make upgrades. Currently, these models have low uptake.
4. **Household-led** is the primary way that home retrofit and improvements are paid for, from personal savings.

At this stage, across all models, government still needs to act as first-mover to bring down the cost of retrofit (whether through subsidy, grant, credit line or guarantee) to incentivise the private sector in contributing additional funding and/or underwriting projects, and ultimately drive permanent cost reductions for technology. This report primarily focuses on public-sector and market-based models

Retrofit does not attract large-scale institutional investment. While private finance is expected to meet around two-thirds of investment costs in energy,[69] existing homes are different to offshore wind or transmission lines. Bigger infrastructure projects yield long-term revenues, attracting capital from large businesses and institutional investors. That is not the case for retrofit because of:

- **Returns:** Benefits of retrofit largely come in the form of bill savings, rather than revenues. This is amplified in the private rented sector where landlords invest in upgrades but tenants benefit from cheaper energy bills, creating a split-incentive;
- **Scale:** An individual home is regarded as too small a 'ticket item' to attract large-scale finance and the make-up of our housing sector prevents aggregating multiple homes into one portfolio. Around seven in ten homes in need of retrofitting in England are owner-occupied, meaning that the owner-occupier is the sole investor and decision-maker over their own individual property. Currently, there is no procurement or financial mechanism by which large-scale private finance could coordinate such an infrastructure project.

69 NIC, *The Second National Infrastructure Assessment*, October 2020

This is a key barrier to delivering area-based approaches outside of social housing estates or local authority funding remits.

- **Reporting:** Efficiency measures are frequently installed as part of wider home renovations, making it difficult to ring fence 'green' finance and report on carbon savings for businesses' ESG targets.

Existing finance options for households are dominated by grants and mortgage products

There are a range of private finance products available to reduce the upfront costs of retrofit. In England and Wales, they primarily comprise central government grants for part-funding upgrades and mortgage-based lending from high street banks. Uptake of these products has been low - in January 2024, Nationwide Building Society found that 4% of survey respondents had a green mortgage and just 4% had green home-related loans, down from 6% in 2022.[70] Barriers to using private finance for energy efficiency upgrades are explored on the page below.

Table 2: Finance products currently available in England and Wales (Scotland explored below)

Product	Level	Coefficient
Government grant funding to unlock household finance		
Boiler Upgrade Scheme (BUS)	Provides £7,500 grant to homeowners for heat pumps, around 75% of the cost. £5,000 grants are also available for biomass boilers. Provided directly from DESNZ through MCS-accredited installers.	Uptake of the scheme has been slow,with 47% underspend in its first year. Demand has increased since the £2,500 uplift in grant value in October 2023.[71] 34,300 vouchers have been issued so far. Public opinion research shows grants are critical in pump priming the market.
Energy Efficiency Grant (EEG)	Planned scheme from 2025-2028. The scheme design needs to be developed. Early proposals indicate the grant will fund insulation and radiator upgrades to make homes heat pump ready.[72]	Scheme is not yet running.
Market-based models (predominantly mortgage based)		
Green mortgages	Discounted interest rates and cash-back options for buying properties that are already energy efficient (ie EPC A or B).	While more banks are offering green mortgages, they do not incentivise retrofit as homes are already energy efficient.
Mortgage top-up (add-to-my-mortgage)	Enables additional borrowing on top of existing mortgage to pay for energy-efficiency works.	Benefits homeowners with existing mortgage and less equity, although means higher monthly repayments.
Green Equity Release	Enables homeowners to exchange equity in their property for cash (for home upgrades) with favourable terms.	Benefit of no monthly repayments but only for homeowners aged 55 and above. Low takeup particularly post-Covid.
Equity loans	Allows homeowners to borrow against equity in the property to invest in energy-efficiency measures.	Benefit of short-term fixed monthly payments at a fixed rate. Government could support here to ensure favourable borrowing terms. This already exists in Scotland [see below].

70 Natwest, *Greener Homes Attitude Tracker*, January 2024

71 Public First analysis of DESNZ, *BUS statistics*, April 2024

72 UK Government, *Families, business and industry to get energy efficiency support*, December 2023

Key barriers to increasing uptake include low knowledge of options and a reticence to take on debt

Public First's extensive public opinion research found that although homeowners want to improve their property's energy-efficiency, key structural and attitudinal barriers remain to using finance products.

Access to finance is not a demand driver but an enabler. Households have to know what their home needs and how that will benefit them before they consider using finance products. As evidenced in Part 2.1, although there is latent demand among households to improve their home's energy efficiency, many do not know where to start. Focus groups conducted by Public First demonstrated how information gaps act as a barrier before costs.

> *"It's all very well offering loans for options. If people don't know what option they need to take, you don't know what route to go down. It needs to come with education before."* Female, aged 45-49, homeowner, high socio-economic group

Homeowners prefer to use savings, not loans, for general home renovations and energy efficiency upgrades. 70% of homeowners said they typically use their personal savings to pay for expensive upgrades, such as new furnishings, new roofing, a new kitchen or new insulation, compared to 9% that would borrow from a bank. Thinking ahead, a total of 61% of mortgage holders said they would be unlikely to consider adding to their mortgage to improve their home's energy efficiency. This is driven by a strong reticence to take on debt, particularly given the recent spike in interest rates leading to high mortgage costs.

> *"I don't like owing money. I like to spend what I have."* Female, aged 25-29, homeowner, high socio-economic group

Homeowners are most interested in government grants for finance support. 52% of outright homeowners and 49% of mortgage-holders say that a government grant of up to £7,500 would incentivise them to improve their energy efficiency compared to an interest-free bank loan as part of their mortgage for the same value (8% and 17%) respectively. While tax incentives were less popular, there was some appetite for 0% VAT on energy-saving measures (which already exists), and tax rebates for improving their home. Over time, as grants expect to wind down, policymakers should consider how tax incentives can continue to provide an attractive financial proposition for homeowners.

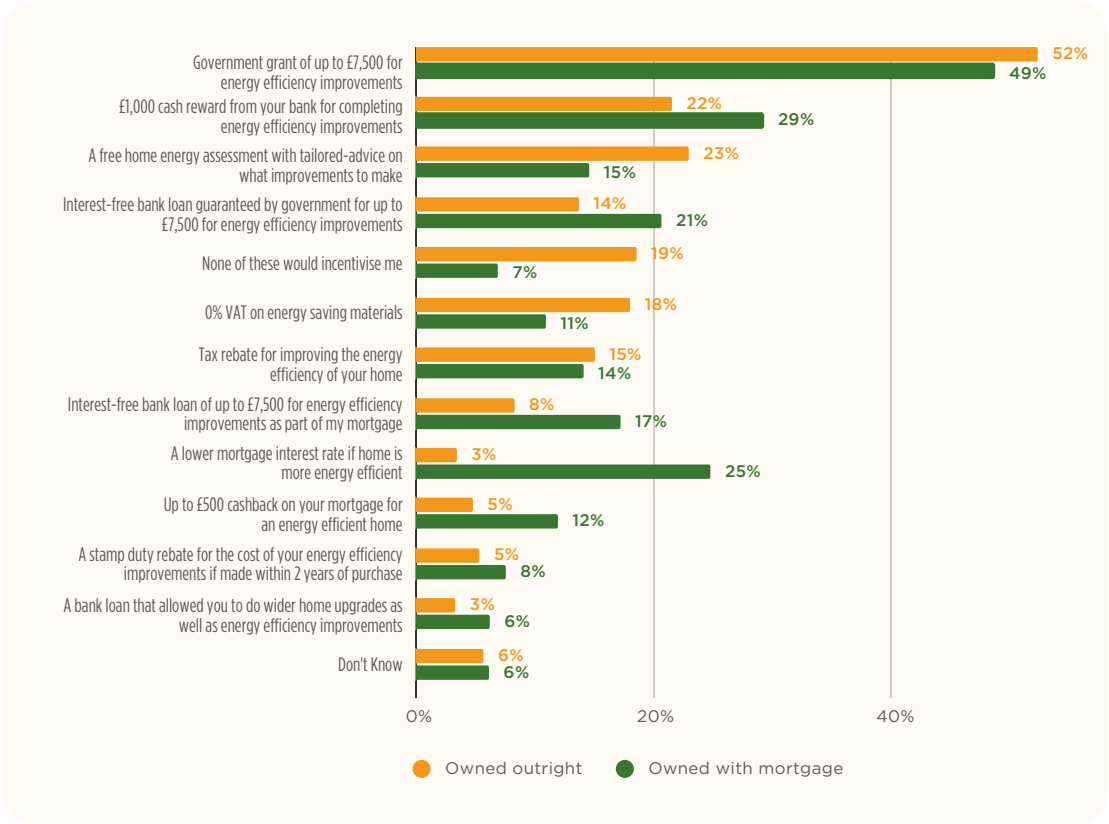
Notably, one in five outright homeowners say none of the below financial options would act as an incentive, indicating that either cost is not the only barrier or innovation is required to develop new financial products.

The government must clearly set out the guidance and eligibility for the planned Energy Efficiency Grant (EEG) launching in April 2025, with clear marketing and information campaigns through the NHUP [See Part 2.1]. While the scheme's design is in development, early proposals indicate that the grant will fund measures to help make homes heat pump ready, including insulation and radiator replacements. As a

result, the scheme should also be marketed alongside the Boiler Upgrade Scheme (BUS).

Maintaining current grant levels for heat pumps will be fiscally unsustainable - the new government must work with the private sector to identify new finance models. The Boiler Upgrade Scheme (BUS) grant is an important policy lever to pump-prime the 'able to pay' market in the short to medium term. However, continuing current levels of subsidy (£7,500) is not fiscally sustainable nor should it be necessary for very long, as technology costs should fall following the implementation of a Clean Heat Market Mechanism (CHMM). Public First estimates that in 2023, around 67% of heat pumps installed in English homes came through BUS with the rest funded through other schemes (30%) or without policy support (3.5%).[73] for the majority share of the market would cost the Exchequer billions of pounds over the next five years [See Part 3.1]. This parliament, the new government must plan for how and when heat pump grant schemes for 'able to pay' households ramp down, in line with technology cost reductions, without negatively impacting demand. This means that exploring new private finance options is critical.

Figure 14: % of homeowners that say the following financial option would incentivise them to improve the energy efficiency of their home



Source: Public First. Poll question: "Which of the following financial options would incentivise you the most to make energy efficiency improvements to your home? Please select up to three."

73 Public First analysis of MCS data dashboard and DESNZ scheme statistics.

Other countries offer a wider range of private finance products

Governments abroad have developed innovative finance products with the private sector to overcome uptake barriers. For example, low-interest loans in Germany can be used on upgrades beyond energy-efficiency, appealing to demand for general refurbishments. Additionally, loans in the US are linked to the property to mitigate concerns around long payback periods if homeowners move.

Table 3: Example finance products available

Model	Product	Findings
Government-Backed zero/ low interest loans: Government extends a line of credit to high street banks to offer favourable interest terms and longer payback periods.	**KfW Bank - Germany**	Since 2001, KfW, the world's largest national development bank, owned 80% by the Federal Republic and 20% by the States of Germany, has provided low-interest loans to households for energy efficiency refurbishment. • Loans are offered up to €100,000 per home with long payback periods of up to 35 years. • A 'bonus' subsidy on the loan is available if refurbishments achieve an energy efficiency standard of new build regulation or better • Homeowners can also use loans towards general refurbishment as well as energy efficiency. KfW extends a credit line to commercial banks, who have pre-existing relationships with customers and therefore can better judge risk.
	MaPrimeRenov - France	The French government's programme MaPrimeRénov offers information and financial support for households to retrofit their homes. Since 2022, on top of existing grants, MaPrimeRenov launched zero-interest loans from high street banks of up to €50,000 for households. More than 300,000 were financed from January to March 2022.[74]
Property-linked finance: Loans for energy efficiency are linked to the property, rather than the property owner. This means the payment obligation transfers to the new owner when it is sold.	**Sustainable Australia Fund - Australia**	Sustainable Australia Fund is the first, and currently the only, financial provider offering Property Linked Finance in Australia, known as Environmental Upgrade Finance (EUF). EUF is only available to businesses with existing commercial buildings, not residential due to legislation prohibiting payments being passed onto tenants in the event homeowners rent their property out. • EUF offered by Sustainable Australia Fund, a specialised non-bank lender, has terms between four and 20 years and covers up to 100% of project finance • Payments are made through local council rates and can be split between commercial landlords and tenants. By the end of 2022, the fund had delivered energy savings of over AU$111 million and delivered emissions savings the equivalent of taking 395,171 cars off the road for one year.[75]

74 Institute for Government, *Tackling the UK's energy efficiency problem*, September 2022

75 Green Finance Institute, *Property Linked Finance: A new financial solution to decarbonise the UK's homes and buildings,* November 2023

Property-linked finance: Loans for energy efficiency are linked to the property, rather than the property owner. This means the payment obligation transfers to the new owner when it is sold.	**Home Run Financing (formerly PACE)- USA**	Home Run Financing, founded in 2014 as PACE Funding, is the largest of four lenders that currently provide residential Property Assessed Clean Energy (PACE) financing in the U.S.. • Home Run Financing provides low, fixed interest rate loans for 100% of costs up to 30 years for residential energy efficiency, renewable energy, water efficiency and resilience projects. This means that the annual energy savings for a PACE project can exceed the annual assessment payment, making owners cash flow positive in the first year. • Homeowners make payments via an assessment on the property's regular tax bill. • PACE-funded projects can be eligible for state and municipal tax credits and other incentives, which can also reduce the overall cost. Since the company's inception, it has invested over $785 million, saving over 15 million kWh of energy and 5 million tonnes of greenhouse gas emissions. However, only California, Florida and Missouri have legislation that allows it in residential property, while commercial PACE is available in 33 states and the District of Columbia.[76]
On-bill financing: Lets households pay for upgrades through their energy bills	**Heat/Energy as a Service (H/EaaS)**	Heat/Energy as a Service offers a wraparound care package to include finance for upfront costs of low-carbon heating or microgeneration technology (solar PV, batteries etc), ongoing optimisation, servicing, maintenance, and breakdown support. Repayments are then made on-bill to the energy supplier. These products are currently under development for residential homes and offered on a small-scale, but are likely to be more popular in future.

Given that home upgrade policy is mostly devolved, finance products currently differ between devolved nations. Since 2022, the Scottish Energy Efficiency Loan Scheme has offered zero-interest loans to households through the Home Energy Scotland advice service. Loans are available for specific measures (such as solid wall insulation, solar PV, heat pumps and more) and can be combined with grants where applicable. The scheme has seen a steady rise in applications for heat pumps, receiving over 6,000 applications since the end of August 2023, with over 1,900 funding offers issued - up 22% on the previous year. Wales also runs home improvement loans of up to £35,000 through local authorities. However, currently, government-backed loans are not available in England. In its 2024 manifesto, the Labour government pledged to work with banks to provide further private finance. Below we identify public attitudes towards what this product might look like.

Homeowners are open to different finance products but have reservations

This section explores public attitudes towards three private finance options, flagging considerations that policymakers should include as these products develop: government-backed zero-interest loans; property-linked finance; and on-bill finance.

Government-backed zero-interest loans

While the zero-interest nature of such loans helps reduce the cost of the finance for

76 Green Finance Institute, *Property Linked Finance: A new financial solution to decarbonise the UK's homes and buildings*, November 2023

bigger home upgrades, homeowners are still hesitant to take on debt.

- **Government's role in underwriting interest could increase the attractiveness of the loan.** As shown in Figure 13 above, 14% of outright owners and 21% of mortgage holders say a government-backed interest free loan from the bank would make them more likely to make upgrades. Notably, this is more popular than a standalone interest-free loan from the bank as part of their mortgage (8% and 17% respectively). This could be due to the current discourse around mortgage increases, but it is possible that government involvement makes the product more attractive.
- **Homeowners have concerns about the terms of the loan.** When testing the concept in a focus group of financially-secure homeowners, questions were raised about whether a) the loan would appear on the borrower's credit file, given that student finance loans do not, and b) what happened to the loan repayments when they move house.
- **Including wider renovations in the loan package could be attractive.** Homeowners say the optimal time to do energy efficiency improvements is when they are doing other home renovations (73% agree) followed by when their boiler breaks (71%) and moving into a new home (64%). Policymakers should consider how far loans could be extended to also include wider renovations, like KfW loans in Germany.

  "That will be one of my primary concerns - how it would impact my ability to get credit for other reasons" Female, aged 40-44, homeowner, low socio-economic group

  "If we couldn't sell the house until we'd repaid the loan, that would be a worry" Male, aged 30-34, homeowner, low socio-economic group

  "We did get a new boiler about five years ago when we did some extension work and we got some new windows and doors." Female, aged 45-49, homeowner, high socio-economic group

In a recent report by the Green Finance Institute (GFI), its National Wealth Fund Taskforce recommended that priority investments for the Fund should include building retrofit.[77] However, homes were not listed as part of the National Wealth Fund in the Labour government's 2024 manifesto. The government should consider the GFI's recommendations and consider whether the Fund could support zero-interest loans alongside the UK Infrastructure Bank (UKIB).

Property linked finance

There is potential for a property-linked finance market. The public are willing to pay more for energy-efficient homes and would consider buying a home that has property-linked finance, but homeowners currently worry that this is not the case. The new government should work with the private sector to continue exploring this product, focusing on communicating the advantages of selling an energy efficient home to existing homeowners.

77 Green Finance Institute, *National Wealth Fund Taskforce – Report*, July 2024

- **There is potential to develop property-linked finance with over one in five homeowners interested.** 22% of homeowners (31% mortgage holders and 16% outright owners) say they are likely to use property-linked finance to make energy efficiency upgrades (see Figure 14). Although two in five (44%) would be unlikely, there is potential to explore this product further. **Homeowners recognised that property-linked finance is a solution to the problem of perverse incentives.** Homeowners recognise that some energy efficiency upgrades have long payback periods and are not always reflected in higher house prices. Some focus group participants understood the need for a product such as property-linked finance until house prices show a clearer 'green premium'. However, some participants did not think it was reasonable to pass on retrofit costs, given that this is not standard practice with other home renovations.
- **Homeowners are concerned that property-linked repayments would be unattractive to buyers.** In focus groups, participants were concerned about burdening potential buyers with additional costs, which would make the house harder to sell. **However, there is appetite among the public to buy a property-linked financed home.** Nearly three in ten (28%) of the public and over one in five homeowners (23%) would be likely to buy a home that has already been upgraded and has property-linked finance - Figure 14. Focus group participants indicated that this is because it removes the hassle of having to upgrade the property yourself.
- **The public are willing to pay more for an energy-efficient home and there is low demand for 'brown discounts'.** 68% of the public think that the energy efficiency of a property should be reflected in the property's value (62% for rental value). The vast majority (85%) think efficiency should increase the value of homes and 78% think poor efficiency should reduce the value (see Figure 15). However, the idea of a 'brown discount', as described in commercial property, is unlikely to appeal to homeowners or renters. Almost half (52% homeowners and 43% renters) would not be willing to move into a cheaper home with poor insulation to save money, compared to one in five (20%) homeowners and 28% renters who would.

  "It sort of makes sense in terms of if the developments you do to the property aren't priced into the value of the home... But if it is, I think it'd be quite off-putting for a buyer to absorb that sort of burden, particularly if it's a substantial burden. [...] I don't feel comfortable passing that onto someone else." Female, aged 40-44, homeowner, low socio-economic group

  "I don't really see it any different to, for example, putting an extension on the house and then saying to the [new] purchaser, 'by the way, I've still got a £5,000 loan on this, you are going to have to take it over. It doesn't fit. It doesn't seem part of a normal discussion to me." Female, aged 40-44, homeowner, low socio-economic group

Figure 15: % of homeowners that would consider using property-linked finance

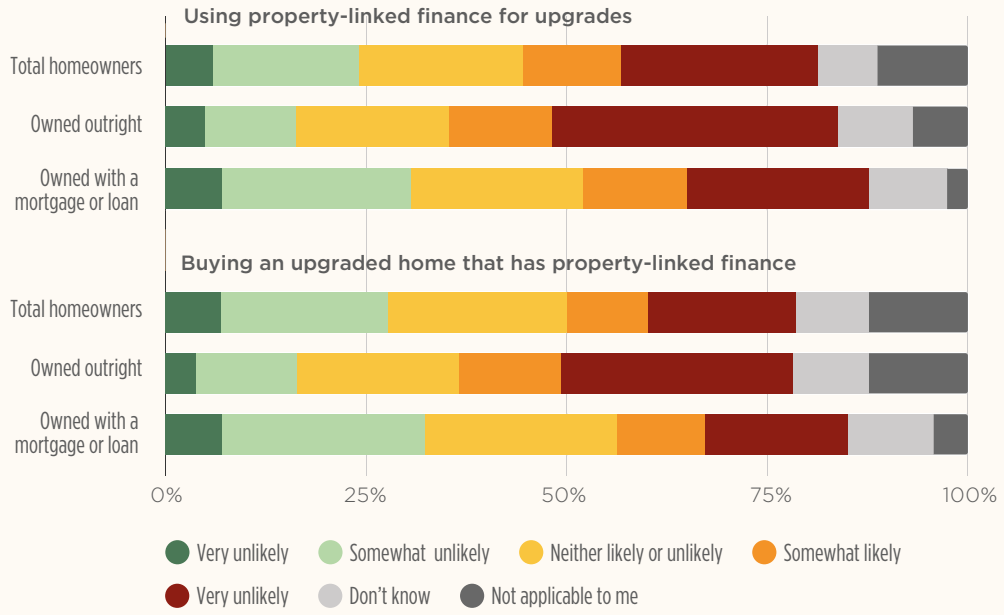
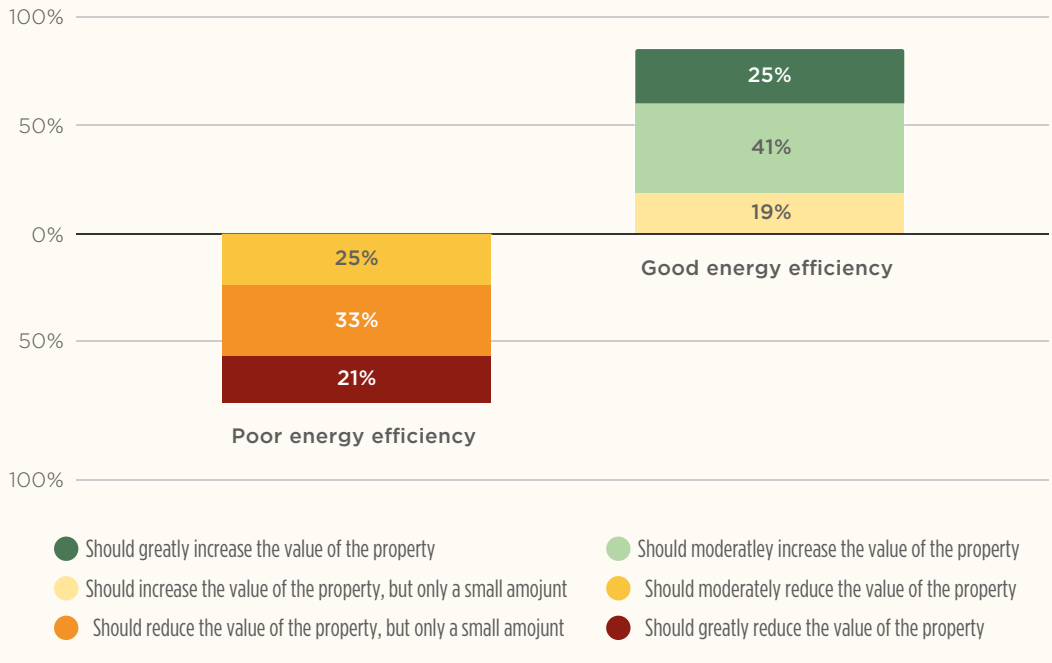


Figure 16: % of the public that think poor/good efficiency should decrease/ increase house prices



Source: Public First analysis. Poll question: "How much of an impact, if any, do you think having good/poor energy efficiency should have on property value?"

Energy service agreements/on-bill financing

Homeowners are interested in other financial products like service agreements with their energy providers for low-carbon technology whereby the upfront cost is paid back over-time on energy bills. Focus group participants likened this to subscription-based or 'buy now pay later' services, which had greater appeal than loans, which they associate with debt. As Heat/Energy as a Service models develop, policymakers should learn lessons from previous on-bill financing models, such as the Green Deal, which failed due to poor policy design, limited financial appeal (due to unattractive interest rates), and narrow engagement with consumers.[78]

> *"I don't like owing money. I like to spend what I have so a 0% loan doesn't really appeal. It sounds stupid, but I guess it's a psychological thing. If it was framed as like a monthly subscription or a monthly fee or a payment plan… it does appeal more even though it is basically the same thing as a 0% loan. When I hear the word loan, I just shy away from that because I personally try to avoid borrowing."* Female, aged 25-29, homeowner, high socio-economic group

> *"Why couldn't your energy supplier pay for the solar panels and then take half of the money every month from what you're getting? You know, and they're taking it back so you're paying for it that way? Can't that work? And then when it's paid off, it's yours. And then you're still helping the environment, aren't you?"* Female, aged 55-59, homeowner, high socio-economic group

> *"I think this is quite interesting. You could actually lease your roof to your electricity provider."* Male, aged 45-49, homeowner, low socio-economic group

Homeowners are sceptical about a neighbourhood-based energy service agreement citing 'neighbourhood wars' over home upgrades. Financial products for mixed tenure-mixed income areas are currently undeveloped, which hinders scaling area-based retrofit for neighbourhoods of hundreds or thousands of homes. Given that properties within an area can vary in terms of their efficiency, homeowners are concerned about 'who would get what' in terms of upgrades and technology solutions. One focus group participant felt that it would divide neighbourhoods instead of bringing them together, due to the risk that some would appear to get 'more' than others.

> *"I could see neighbourhood wars going on there. Just I could honestly see people thinking about fairness and equality of what they're getting against or what they're paying, just causing a divide rather than bringing people together. […] If everyone got the same thing and you're paid the same price, I can't see any problems. But I highly doubt that's going to be possible."* Male, aged 30-34, homeowner, high socio-economic group

78 Environmental Change Institute, *Austerity, Energy Efficiency, and Failure in British Energy Policy*, November 2016

2.4 Recommendations

The UK will not decarbonise its homes in time for net zero without private finance - but currently there is low uptake of existing products. Homeowners are reluctant to take on debt, particularly following high mortgage rates since 2022. The government must pump-prime the market with public funding, communicate the value of energy efficient homes to homeowners, and work with the private sector to develop more attractive finance products.

Identify and communicate 'green premiums' in house price

- As part of the national information campaign, continue to gather evidence on 'green premiums' in house prices, and work with the real estate sector to ensure it is communicated clearly with homeowners.

Continue to provide grant support to pump prime the market, with plans for how to ramp down

- Extend the Boiler Upgrade Scheme (BUS) to 2030 with clear plans of how the grant value will reduce in the second half of the parliament as take up increases and installation costs fall. Consider how grant levels may vary based on income levels.
- Clearly set out the guidance and eligibility for the planned Energy Efficiency Grant (EEG) launching in April 2025, with clear marketing and information campaigns through the NHUP [See Part 2.1]. The scheme should also be marketed alongside the Boiler Upgrade Scheme (BUS) to reduce financial barriers of ancillary costs for heat pumps, and to ensure heat pumps run efficiently.

Work with the private sector to continue developing new financing models to grow the market

- Consider whether home retrofit should be included in the National Wealth Fund portfolio.
- Work with high street banks and the UKIB to establish the terms for and launch government-backed interest free loans in the second half of the parliament, taking flagged consumer concerns into consideration. Loans should be available in step with BUS ramping down to avoid any gaps in available finance.
- Develop clear information for households on what the loan terms, available to households through the National Home Upgrade Programme information tools [See Part 3.1].
- Continue to explore property-linked finance and Energy/Heat as a Service products with the private sector, learning lessons from previously failed repayment schemes such as the Green Deal. In the short-term to support these models, a government information campaign should communicate the advantages of selling an energy efficient home to homeowners.
- On-bill financing options should also be explored to enable large institutional investors to enter the market and charge consumers a service charge for installed heat infrastructure.
- Explore tax incentives to maintain an attractive financial proposition for homeowners, particularly as grants ramp down over time.

Part 2.5

Grow The Home Upgrade Workforce

The heat pump engineer workforce must more than double by 2028.

"Businesses are concerned the green agenda is just a trend. They aren't convinced there is a market out there for them to expand into. It's a hard sell convincing them to take on extra resource and commitment."

- Local authority

2.5 Grow the home upgrade workforce

For the incoming government to deliver on its existing policy (fuel poverty targets, heat pump engineers target, carbon budgets) the retrofit skills pipeline needs to be boosted - both by reskilling the existing industry, and attracting new entrants such as apprentices. **If the new Labour government wishes to accelerate policy, then it will need to quickly and decisively intervene in the retrofit skills system in order to be able to deliver installations.**

The UK government has set the goal of installing 600,000 heat pumps a year by 2028 - to meet this, the heat pump engineer workforce must more than double.[79] The construction industry estimates that its workforce must increase by 250,000 before 2028 in order to meet demand and, for almost a third of construction employers, finding suitably skilled staff is their key challenge.[80] As well as this, upgrading homes requires coordinated and multi-skilled teams to deliver a smooth customer journey, for example the skilled staff to join up delivery of heat pump installations, radiator replacements, and insulation upgrades where needed.

However the UK skills system is a complex and overlapping web of actors, and is slow to change. It is a particular challenge for retrofit: unlike other transition industries which are clustered in specific geographic areas, the retrofit workforce must be dispersed across the country. The current makeup of gas engineers, and the construction industry more generally, is older than average, nearing retirement, and working in small businesses or self employed. These predominantly SMEs are isolated from the skills system which makes it harder for government to support and signal to them the need to retrain. Our research shows:

- Tradespeople have the appetite to retrain and upskill, particularly gas engineers, but lack the incentive to do so.
- Tradespeople are concerned by the impact of cowboy installers, who reduce consumer trust in low carbon heating technologies.
- Young people do not find a career in trade attractive, which means there are fewer new entrants and retention is poor.
- The current careers education young people receive fails to direct young people into the retrofit sector - neither into trade *nor* into allied low-carbon industries.
- The apprenticeship pay for retrofit is not competitive, and the new Growth and Skills Levy must ensure that current levels of retrofit apprentices are exceeded.

Government has so far neglected the skills issue, and instead focused on stimulating

79 Nesta, *The Heat Pump Installer Gap*, Jul 2022 / Heat Pump Association, *New industry data shows a 166% increase in qualified heat pump installers*, 2023

80 CITB, *Focusing on the skills construction needs, 2024-2028*, May 2024

demand in the hope that the market will then incentivise the training of thousands of new entrants and existing workers. This approach hinges on a steady supply of work to retrofit businesses spread evenly across the country - which has not been the case. Government is failing to provide the correct incentives and set out a clear policy roadmap for businesses to get on board.

Implementing the recommendations in this report would enable a consistent supply of work, stimulating demand to incentivise existing workers to retrain and take on new entrants. Developing the policy framework for area-based approaches in particular can support local supply chains, as a consistent pipeline of demand will be concentrated in local areas, rather than diffused across the country.

There are key actions that government must take in this parliamentary term to unlock barriers for new entrants and set direction and standards for the industry so that it has the workforce to be able to physically deliver on its policy ambitions, and later deliver an area-based approach. Our research found that the new government must:

Set the direction for the existing workforce and incentivise them to upskill

Retrofit tradespeople are predominantly working in SMEs or self employed, and are dislocated from the skills system, which makes it hard for local authorities, colleges and central government to communicate with them effectively. This is made more difficult by the fast pace at which the industry is changing, and conflicting advice to tradespeople, for example on the future role of hydrogen in home heating. We therefore recommend that government supports local authorities to develop procurement frameworks that ask large contractors to mentor their SME's - educating them on the future pipeline of work, and trajectory of government policy, for example, accreditation and gas boiler phase out. This will help to educate and connect SME's to the larger skills system.

The current supply of work for retrofit in private homes is not sufficient for most businesses to justify taking on more staff or invest in retraining themselves. This was clear in our interviews with local authorities and focus groups with tradespeople.

> *"Businesses are concerned the green agenda is just a trend... they aren't convinced there is a market out there for them to expand into and so it's a hard sell convincing them to take on extra resource and commitment."* Local authority.

Tradespeople have the appetite to retrain and upskill, particularly gas engineers, but lack the incentive to do so. There is no government policy requiring accreditation for work in private homes. Accredited installers are not viewed as more competitive by the homeowner. This is because homeowners lack awareness of what accreditations to check for, find the standards system confusing and are generally unwilling to pay more for an accredited installer.

> *"Awareness is very low. No one knows about certificates or the company you're with... I could go into a house and (say I'm not qualified), and I could say I'm gas safe qualified. They [consumers] ain't got a clue"* Male, aged 48, gas

engineer, SME.

> *"It's challenging enough to find qualified people as gas engineers, let alone with a heat pump qualification. And if we do it we lose money for the work we've missed out on, and we're paying for the course, then you have to renew it once a year. For the three jobs you get a year, it doesn't make it financially viable."* Male, aged 47, gas engineer, self-employed.

A further disincentive to tradespeople considering accreditation is that they don't see many of the accreditations as high quality and adding value to them personally - several thought that the MCS accreditations lacked standardisation and were not high quality. We know that MCS is currently working hard to fix these problems.

> *"The MCS is nothing to do with installation. It's all about the paperwork and filling out the form. It's the same with solar panels. Its really annoying... the problem is the companies that have got it, their engineers are underqualified and they're being installed wrong... a lot of clients have nightmares where they've not done the pipe sizing right..."* Male, aged 33, plumber, self-employed

Both Which? and Citizens Advice have published research validating these findings - both call for mandatory accreditation for retrofit installations (particularly low carbon energy), and Citizens Advice advocates for the creation of a single accreditation body for installers.[81]

Tradespeople are concerned by the impact of cowboy installers, who reduce consumer trust in technology. The industry recognises this is a problem, and sees a lack of regulation as the source. As mentioned above, consumers are neither adequately educated nor protected from rogue actors, and the current ecosystem of regulators and accreditors is complicated, overlapping and rapidly changing. Tradespeople want a stronger enforcement regime and stricter standards - they also expect that government will eventually institute these out of necessity to protect consumers and ensure consistency of quality.

> *"[Mandating a certificate] is a good way to make sure it's done safe, because you will just get anyone fitting them, as it's done now, and there are a lot of problems"* Male, aged 46, gas engineer, SME owner.

Recent Which? research confirms our findings, describing how households experience *"significant anxiety"* in choosing tradespeople to fit low-carbon heating systems after "*press stories about poor work and rogue traders.*"[82]

The tradespeople we spoke to assumed that consumers will increasingly want to see certification, despite the fact that policy is not clearly signalling this direction for the private market. Their assumption is that, as was the case with GasSafe, the industry

81 Which?, *Building trust: improving the reliability of installers in sustainable home heating,* May 2024 / Citizens Advice, *Giving consumers confidence to install low carbon technologies*, December 2023

82 The Guardian, *Make accreditation mandatory for low-carbon heating installers, says Which?* May 2024

will become more regulated and there will be clearer guidance to consumers that are paying for measures privately on a) accreditation to seek and b) a list of suitable trained local installers. This means that they expect the current inbalance between standards for publicly funded and privately funded schemes to be addressed - and that homeowners getting work privately installed will be just as well protected as those through publicly funded schemes already are. Whilst this expectation is a positive step, the government still needs to set the standards and direction for the private market to give tradespeople and consumers certainty. We recommend that government sets a clear pathway for clean heat training that gives certainty to new entrants and those reskilling on future skills requirements, for example a mandate by 2030 for all heat pump engineers to be Level 3 MCS accredited.

Attract new entrants

Young people do not find a career in trade attractive, which means there are fewer new entrants and retention is poor. Previous research by Public First shows that only 8% of young people are interested in working as a retrofit coordinator, and 7% as a heat pump installer.[83] Tradespeople describe how the image of the industry has changed in their lifetime - from an attractive route when they were young to one with a poor reputation. Roles as gas engineers and in trade more generally can be very lucrative, have a high degree of autonomy ("being your own boss") and job security, but young people have negative perceptions of the industry as being too physically demanding and not as high status as white-collar desk jobs.

> *"When I come out of school, it was my first choice to get into trade and boom I'm jumping to that. But now these days they aren't... The kids I work with now, it seems like it's their last option. Nine out of ten of them don't want to be there."* Male, aged 33, plumber, self-employed.

Whilst trade has negative connotations, this is compounded for retrofit by the fact that green jobs *also* have a negative reputation and are poorly understood. In fact, 25% of young people thought that green jobs would be more competitive and pay poorly, and young women were only half as interested in being a heat pump installer as young men.[84]

The current careers education young people receive fails to direct young people into the retrofit industry - both into trade *and* into low carbon industries. The tradespeople we spoke to felt that the UK education system places a premium on university routes, and contributes to negative perceptions of working in trade. Research validates these personal experiences: careers support for those pursuing vocational options tends to be poorer, with university still seen as the "default option" in the eyes of teachers and families.[85]

> *"When I left school I was the only one of my friends who went down the*

83 Public First, *Generation Green Jobs?* November 2023

84 Public First, *Generation Green Jobs?* November 2023

85 SMF, *How well does careers information, advice and guidance serve the people it is meant to support in England?* November 2022

> *apprenticeship route. They all went off to university because that's what's really pushed... they need to push that trades are a good route."* Male, aged 23, gas engineer, local council.

Education is also not adequately informing young people of the key growth industries in the next few decades, which makes jobs in low carbon technology and retrofit sector less attractive. Whilst the Gatsby Benchmarks (the standards by which schools work to support young people as they make career choices) do ask schools to include labour market information in their teaching, young people have a low understanding of which sectors will experience the greatest growth. Previous research by Public First shows that young people have a particularly shallow understanding of how net zero will impact industries and their careers. Only 20% of young people think that building energy efficiency and retrofit will have more jobs available compared to other net zero-related sectors such as farming.[86] This is an area in which organisations such as the Careers and Enterprise Company are working hard to supplement schools teaching.

A lack of awareness in students is *already* hampering efforts to skill young people for retrofit, wasting college resource. Our interviews with local authorities showed that despite local colleges offering new low carbon courses, these are undersubscribed while more traditional high-carbon courses such as gas engineering continue to be oversubscribed. Secondary schools and colleges, and state institutions more broadly, need to signal to young people that working in the retrofit industry is a secure, well-paid and interesting job with long-term career security. We recommend that government instructs colleges to include an element of clean heat training in their existing (and highly popular) gas and plumbing courses, and instruct the same for Gas Safe certification. For example, low flow temperature heating training as a standard part of gas safe training.

The apprenticeship pay for retrofit is not competitive, even if the long-term pay is attractive, and this harms retention. Often apprentices will leave for better paid roles, such as in hospitality. The cost of living crisis may have increased the urgency of finding better pay, despite these moves harming their long-term career prospects.

> *"I think the wages are a big thing that puts people off. Apprentice pay is lower than minimum wage. So quite often you could end up earning more in your local shop... I know a lot of people that did drop out because of the money."* Male, aged 23, gas engineer, local council.

The new Labour government should increase the apprenticeship wage in energy efficiency and clean heat roles

Increasing the remit of the Apprenticeship Levy to include funding for existing workers must not come at the expense of young, new entrants into retrofit. In its 2024 manifesto, the Labour government pledged to change the Apprenticeship Levy to a 'Growth and Skills' Levy which gives employers more flexibility in how they spend

86 Public First, *Generation Green Jobs?* November 2023

the money.[87] This essentially extends the levy support to include non-apprentices and may help existing workers to retrain for clean heat for example. This would not be a problem if much of the levy was clawed back by the Treasury, but in the period 2022/23 only 4% of the budget was returned implying that the money is being used to fund apprenticeship places.[88] Labour has since stated they would use some of the levy to fund pre-apprenticeship traineeship courses.[89]

The current proposal does not include additional funding, and there has been no confirmation since June 2023 that there will be a ringfenced budget for apprenticeships or traineeships,[90] However policymakers must ensure that not only are the current levels of retrofit apprenticeship maintained, but exceeded. We therefore recommend that the government confirms how reforms to the Growth and Skills Levy will replace the Apprenticeship Levy and set out clear plans with ring fenced funding to attract *new young entrants* into retrofit and clean heat apprenticeships.

87 The Labour Party, *Labour Party Manifesto 2024*, June 2024

88 Onward, *Off Course*, May 2024

89 Feweek, *Election 2024: Traineeships could return under Labour*, June 2024

90 Feweek, *Election 2024: Traineeships could return under Labour*, June 2024

2.5 Recommendations

The UK's skills system is a complicated and overlapping landscape of agencies that is slow to change. Government policy has thus far been very hands off and failed to create an environment that will attract new entrants and stimulate the upskilling of the existing workforce.

Whilst earlier recommendations will unlock private and public finance and create a demand for retrofit tradespeople, government needs to use its signalling power to change young people's perceptions of trade; boost apprenticeship numbers; and set a clear pathway for more energy efficiency and clean heat training to increase certainty for existing workers to invest in upskilling. This will ensure that all the hard work that is done by the industry and government behind the scenes is not wasted by a lack of suitably skilled tradespeople to physically deliver installations.

Give the existing workforce the incentive to upskill

- Set a clear pathway for clean heat training that gives certainty to new entrants and those reskilling on future skills requirements, for example a mandate by 2030 for all heat pump engineers to be Level 3 MCS accredited.
- Government should support local authorities to develop procurement frameworks that ask large contractors to mentor their SME's - educating them on the future pipeline of work, and trajectory of government policy, for example, accreditation and gas boiler phase out.
- *Earlier recommendations on standardising and mandating accreditation requirements, and setting out plans for how the consumer protection framework will change, will help in this area. See part 2.1.*

Attract new entrants

- Confirm how reforms to the Growth and Skills Levy will replace the Apprenticeship Levy and set out clear plans with ring fenced funding to attract new young entrants into retrofit and clean heat apprenticeships.
- Instruct colleges to include an element of clean heat training in their existing (and highly popular) gas and plumbing courses, and instruct the same for Gas Safe certification. For example, low flow temperature heating training as a standard part of gas safe training.
- Increase the apprenticeship wage in energy efficiency and clean heat roles
- Secondary education in schools and colleges should emphasise the attractiveness of careers in trade, emphasising their pay, progression and job security.

Part Three:

Delivery

Part Three: Delivery

Part Three sets out the delivery details required to deliver a Home Upgrade Plan, including the principles and options for spending the pledged extra £6.6bn, and a timeline of the required policy actions for the rest of 2024 as well as the parliamentary term.

3.1 How to spend the extra £6.6bn

In its 2024 manifesto, the Labour government committed an extra £6.6bn to upgrade homes - doubling the planned investment from the last Conservative government to a total of £13.2bn. How the £6.6bn is spent is ultimately a political decision, and one that ministers will face great difficulty in making. As emphasised in Part One, the cost of meeting the two statutory targets this parliament - for fuel poverty and carbon budgets - exceeds £13.2bn. The analysis below provides insight into these trade offs.

We review the impact of direct household schemes running throughout the new parliament to assess what policy vehicles are available to decision makers to deliver extra funding. These include Social Housing Decarbonisation Fund, Local Authority Retrofit Scheme, Boiler Upgrade Scheme, and the Energy Efficiency Grant. Given the damage caused by the stop-start nature of energy-efficiency schemes in the past, we advise that no new schemes are created (beyond those that have already been pledged) - to improve deliverability, we recommend that officials resist the urge to overhaul the current system and instead focus on addressing design issues [as emphasised in Part 2.3].

The analysis presented assumes the potential impact of schemes, were they to be delivered and spent in full. Unsurprisingly, schemes targeted at fuel poor, low income and socially rented homes, such as the Social Housing Decarbonisation Fund (SHDF) and Local Authority Retrofit Scheme (LARS,) would have wider social benefits of upgrading 101,00 and 133,000 fuel poor and low income homes respectively. On average, per £1bn spent, each scheme could cut bills by £370 and £225 a year, respectively. SHDF and LARS could also deliver carbon savings of around 2 MtCO2.

By comparison, schemes aimed at funding energy efficiency and low-carbon heat measures together for non-fuel poor households could see greater energy and carbon savings, making them more impactful for statutory carbon budgets. At the current grant level of £7,500, for every £1bn spent, BUS could achieve over 9MtCO2 lifetime savings. An Energy Efficiency Grant (EEG) scheme of up to £3,000 per household for cavity wall and loft insulation could achieve less carbon savings than BUS, but still more than fuel poverty-focused schemes with 6.7 MtCO2 per £1bn of government spending. Given the cost of these installations to the Exchequer is lower, on average, than a heat pump or upgrading a fuel poor home, the EEG could reach around four times as many households as BUS, LARS or SHDF.

In reality, no one scheme will be the silver bullet for upgrading homes this parliament. The government must make progress towards both statutory targets and therefore spread the extra £6.6bn across various schemes as well as improve the design of them to address underperformance [See Part 2.3]. Below we outline what progress planned and additional spend could achieve. For each scheme, we estimate a target based on the number of households that would need to be upgraded this parliament to meet existing government targets. For example, we estimate that BUS would need to fund over 450,000 heat pumps in England and Wales this parliament to meet the UK target of installing 600,000 heat pumps a year by 2028, to contribute to statutory carbon budgets.[91] [See Annex for more details on methods].

Public First analysis finds that delivering each of these schemes in full and in line with relevant targets would require a total fiscal envelope of £30.6bn this parliament. While this could upgrade over 5 million homes over the next five years, it exceeds what has already been planned for these schemes (by the former Conservative government) and pledged (by the new Labour government) by £18.4bn.

Table 4: Estimated potential impact of existing & pledged schemes, per £1bn of government funding

	Carbon savings (MtCO2 Lifetime)	Annual bill savings (£, million)	Homes treated, (000s)	Scheme description
Social Housing Decarbonisation Fund (SHDF)	1.9	£37.2	101	Existing scheme. Funds energy-efficiency and low-carbon heat measures for social housing
Local Authority Retrofit Scheme (LARS)[92]	2.1	£30	133	Pledged scheme from April 2025. Will likely fund energy-efficiency and low-carbon heat measures for low income/fuel poor households.
Boiler Upgrade Scheme (BUS)[93]	9.4	-	133	Existing scheme. Funds heat pumps and biomass boilers for all eligible non-fuel poor homes.
Energy Efficiency Grant (EEG)[94]	6.7	£89	449	Pledged scheme from April 2025. Will likely fund insulation measures such as loft and cavity wall, and radiators for all eligible non-fuel poor homes.

Source: Public First analysis, see Annex for more details

Next, our analysis looked at the potential impact of planned and pledged funding [See Table 8 in Annex for details on the existing £6.6bn baseline of planned funding,

91 See Annex for more details on target assumptions.

92 LARS is modelled on the Home Upgrade Grant and Local Authority Delivery Scheme official data, as LARS is expected to replace those schemes.

93 Official data for BUS excludes estimated bill savings as well as sufficient data to model the savings separately.

94 EEG modelling assumes a grant of up to £3,000 per household for loft of cavity wall insulation. Impact assumptions are modelled on Energy Savings Trust data.

which Labour has pledged to double. Under the current planned spend in line with the previous government's allocation, we find that the existing baseline of £6.6bn funding has not been allocated equally across different schemes, relative to their corresponding government targets. For example, BUS is expected to make the most progress, funding 295,000 heat pumps this parliament with £2.2bn. Under current funding levels, we estimate that this could upgrade 39% of the total homes BUS would need to fund for the UK to hit its heat pump target by 2028. By comparison, if delivered in full, the £0.66bn planned for LARS is only estimated to upgrade 88,000 homes (5%) of the total 1.9 million fuel poor homes it would need to treat this parliament to reach fuel poverty targets. The planned £2.2bn for SHDF could upgrade a further 223,000 (34%) social homes under EPC C (including fuel poor). Additionally, the £0.53bn planned for EEG could fund 234,000 (14%) homes with loft and/or cavity wall insulation. Overall, if delivered in full, existing planned investment could treat 1.6 million homes including 765,000 from supplier obligations. The new Labour government must therefore use its extra £6.6bn to close the gap for reaching its target to upgrade 5 million homes this parliament, while also making progress towards existing statutory targets for fuel poverty and carbon emissions.

Table 5 shows the estimated impact of schemes delivered in full if the new Labour government continued the funding approach of the previous Conservative government when allocating its extra £6.6bn. This approach could see BUS come closest to achieving its target (85%) with a total of £4.8bn and a lifetime carbon savings of 45 MtCO2. However, local authority delivery would remain woefully low. The LARS could accomplish just 10% of its target for upgrading homes of the fuel poor this parliament with a total of £1.4bn, benefiting just 191,000 households. **Policymakers must therefore decide how the additional £6.6bn will make fair progress towards existing statutory targets.**

Table 5: Estimated potential impact of planned spend and additional £6.6bn spend across the parliament, under a status quo scenario

	Baseline of planned spend[95]		Additional spend		Impact of total spend	
	£ bn	% of target homes upgraded	£ bn	Total % of target homes upgraded	Carbon savings (MtCO2 Lifetime)	Homes treated, (000s)
Social Housing Decarbonisation Fund (SHDF)	£2.2	34%	+£2.6	73%	9.2	485
Local Authority Retrofit Scheme (LARS)	£0.66	4%	+£0.77	10%	3	191
Boiler Upgrade Scheme (BUS)	£2.21	39%	+£2.6	85%	45.4	642
Energy Efficiency Grant (EEG)	£0.53	14%	+0.62	18%	5	308

Source: Public First analysis, see Annex for more details

95 Planned spend assumed current allocated spending is continued until the end of the parliament. See Table 8 in Annex for more details.

This report identifies key principles for spending government capital funding on energy-efficiency policy. These include:

- Fully-funding retrofit for fuel poor and low-income households through local authorities, extending and combining supplier obligation schemes to continue to fund upgrades for low-income households.
- Part-funding retrofit for all household types through grants and loans to unlock private capital.

In addition to these, this section explores wider principles for how to spread funding, when to ramp it down, and where the government might potentially find more money.

Ramping up funding to build capacity, knowledge and trust

When allocating the extra £6.6bn, policymakers should ensure that funding is spread across the parliament to enable supply chains to build and deliver. Too much funding available too soon risks unspent funds returned to the Exchequer as well as consumer detriment [See Part 2.3 and 2.1].

The OBR notes that departmental capital budgets are almost always underspent (although not as much as some energy efficiency schemes [Part 2.3]). History shows that ramping capital spending up quickly is particularly difficult, implying larger underspends than when spending limits grow over time.[96]

Currently, the market for upgrading homes is developing from a low-base of institutional delivery capacity and demand. It will take time to overcome these information barriers and skills gaps in the supply chain. This means that simply allocating more funding too quickly could result in unspent funds returned to the Exchequer rather than into homes. Funding should be allocated so that it ramps up from mid-parliament. This will enable local authorities to build their expertise and capacity; policymakers to build consumer knowledge using campaigns; and consumer bodies to work with policymakers to improve consumer protections and reduce the risk of detriment.

Ramping down grant levels without undermining consumer confidence

As highlighted in Part 2.4, central government grants, such as the Boiler Upgrade Scheme (BUS), will play an important role in pump-priming the market for clean-heat in the short to medium-term. However, continuing current levels of subsidy (£7,500) is not fiscally sustainable, particularly as technology costs will likely come down following CHMM implementation. Public First estimates that in 2023, around 67% of heat pumps installed in English homes came through BUS, with the rest funded through other schemes (30%) or without policy support (3.5%).[97] Maintaining this level of subsidy for 67% of the English market would cost £1.6bn in 2028 alone if the 600,000 target was to be met.[98]

96 Office for Budget Responsibility, *Capital Spending Plans*, March 2020

97 Public First analysis of MCS data dashboard and DESNZ scheme statistics.

98 Rounding means totals over 100%. Assumed England accounts for 78% of UK target, in line with CCC modelling. 200,000 of the 600,000 target is set to come from new builds which are not eligible for BUS.

As a result, careful consideration will be required to plan how and when grant amounts are ramped down in line with technology cost reductions without negatively impacting demand. This is where the timing and terms of launching government-backed zero-interest loans will be critical to ensure there is not a gap in availability of government-supported finance. The government must therefore begin work with high street banks, building societies and UKIB early on in the parliament to ensure attractive loans are available from mid-parliament onwards.

Finding more than £13.2bn

The costs of hitting statutory targets this parliament exceed what has been pledged. .

The government must seek ways to crowd in private investment [as discussed in Part 2.4] but it is also possible that more public funding may be required. This government is estimated to spend around £12bn in fuel poverty cash programmes (across Warm Homes Discount, Winter Fuel Payments and Cold Weather Payments) over the parliamentary term.[99] One way that policymakers could raise more funding for home energy efficiency measures is by reducing inefficiencies in fuel poverty cash payments.

Last year, over £20 million in Winter Fuel Payments went to 360,000 pensioners living in Europe.[100] That is equivalent to £100m (nominal terms) over the course of the parliament. Previous research by Public First and the Social Market Foundation highlighted distributional concerns over Winter Fuel Payments, highlighting that 17% of pensioners are in the top fifth of earners.[101] This parliamentary term, the government should review the Winter Fuel Payment policy to introduce means-tested measures for better value for money.

Over the course of this parliament, the Warm Homes Discount is worth a total of £750 to a recipient household. Policymakers should also consider how far payments could be modified to ensure funding is spent on energy-saving measures that permanently reduce bills rather than continuing to subsidise gas heating.

This review of payment schemes should be considered as part of wider consultations on targeted bill support (i.e. a social tariff).

3.2 Action timeline

Delivering a Home Upgrade Plan requires both near-term decisions and ongoing efforts throughout the parliament from multiple actors. This includes government departments (HMT, DESNZ, MHCLG, DfE, DWP), Ofgem, as well as wider delivery partners, such as obligation-paying suppliers and local government. As emphasised throughout this report, actions taken in this parliament will enable the government to deliver more ambitious decarbonisation in future.

99 Public First analysis of Ofgem WHD data and DWP benefit expenditure data

100 UK Government, *Winter Fuel Payment statistics for winter 2022 to 2023,* September 2023

101 UK Government, *Pensioners' Incomes: financial years ending 1995 to 2023,* March 2024

To keep policy development on track across various government bodies and wider organisations, a formal coordination of delivery partners and advisors should be established and convenes through quarterly meeting checkpoints. The meetings should be run by the relevant minister in DESNZ, with other relevant government departments, obligation-paying suppliers, funding delivery agents, statutory consumer bodies and the CCC in attendance.

Below, we set out the actions required this year (Table 6) and throughout the parliament (Table 7).

Table 6: Policy to-do list for 2024

Legislation Update secondary legislation for heat and buildings	• Update minimum energy efficiency standards for the private rented sector to be implemented from 2030. • Lay the Statutory Instrument for implementing the Clean Heat Market Mechanism by April 2025. • Lay the Statutory Instrument for the Future Homes Standard within Building Regulations for 2025. • Update permitted development rules to allow heat pumps installations within 1m of homes.
Policy development Set out plans for the future of heat and buildings	• Bring forward the decision on hydrogen for heating. • Launch the two-year delayed consultation on rebalancing electricity levies, aiming for a clear decision before mid-parliament. • Launch a one-year sprint on data-matching for targeted bill support and to reduce search costs to identify vulnerable households for retrofit. • Review unpublished 2021 consultation response on EPC reform with a decision to publish it or launch a short follow-up consultation on real performance metrics and clean heat incentives. • Consult on relaxing stringent ECO eligibility requirements which are hampering delivery, including removing Minimum Requirements from 2025. • Begin work on 'street-by-street' delivery strategy bringing together LAEPs with a standardised methodology and Regional System Planner.
Begin work to confirm details of new schemes launching in April 2025	• Confirm the Local Authority Retrofit Scheme (LARS) guidance including a challenge model, consortia-approaches, and uprated cost caps. • Confirm grant level and eligibility for the Energy Efficiency Grant (EEG). • Set out plans for promoting the EEG in line with early public information campaigns on the benefits of energy-efficiency upgrades, and using a single consumer-facing brand, such as the National Home Upgrade Programme. • Launch a review of the consumer protection framework to identify and mitigate consumer detriment risks as more funding schemes (e.g. EEG) become available.
Fiscal events Prepare for 2025/26 budget allocations	• Set out what progress will be made towards statutory targets of fuel poverty and carbon budgets this parliament, including whether any of the additional £6.6bn will be allocated in the upcoming budget. • Announce a 10-year funding settlement for Local Authority Retrofit Scheme and a long-term settlement for combining and extending supplier obligations. • Confirm how the Growth and Skills Levy will replace the Apprenticeship Levy. Allocate ringfenced retrofit and clean heat apprenticeship funding for young people.

Table 7: Policy delivery with key actions per recommendation theme

		Parliamentary term					
		24-25	25-26	26-27	27-28	28-29	Responsibility of
	Establish plans for allocating the extra £6.6bn and how it'll make progress towards statutory targets this parliament						HMT & DESNZ
Build knowledge and trust	Run national information campaign for NHUP						DESNZ
	on the benefits of energy efficiency, heat pumps, and signal that the cost of electric heating will fall						DESNZ
	on increasing the attractiveness of careers in trade (construction, plumbing, electrical)						DESNZ & DfE
	on the future of gas heating and boilers						DESNZ
	Launch an improved .gov.uk NHUP microsite						DESNZ
	Integrate heat network zones (from 2025) and heat information from RESP/LAEPs (from 2028) for postcode tools						DESNZ
	Regulate for data collection on installation issues to better identify consumer protection problems						DESNZ & Ofgem
	Develop clear guidance on consumer rights and access to redress with supporting regulation on simplifying current system						DESNZ & Ofgem
	Conclude and make recommendations on DESNZ review on enforcing installation standards						DESNZ
	Regulate that all installers must have accreditation for heat pump and energy-efficiency measures, even outside of government schemes						DESNZ & Ofgem
Set a clear roadmap for decarbonising heat and buildings	Update minimum energy efficiency standards for private rented sector and establish plans for an enforcement framework						MHCLG
	Lay the Statutory Instrument for Clean Heat Market Mechanism by April 2025						DESNZ & Ofgem
	Establish plans to bring forward the decision on hydrogen for heating						DESNZ & Ofgem
	Review unpublished 2021 consultation response on EPC reform to publish it or launch a short follow-up consultation on including real building performance and clean heat incentives						DESNZ
	Update permitted development rules to allow heat pumps installations within 1 metre of homes						MHCLG
	Launch consultation on rebalancing electricity levies to make a clear decision before mid-parliament						DESNZ & Ofgem
	Lay the Statutory Instrument for the Future Homes Standard within Building Regulations for 2025						MHCLG
	Develop a 'street-by-street' delivery strategy to develop the policy, finance and procurement framework						DESNZ
	Consult on and implement a common methodology for LAEPs including heating alternatives to heat pumps (ahead of RESP fully in place)						DESNZ
	Work with surveyors to grow the evidence base of a 'green premium' on house prices to landlords and homeowners						MHCLG & DESNZ
Improve the performance of existing schemes for households in need	Set out how much funding existing local authority and social housing schemes will receive from the unallocated £6.6bn funding pot						HMT & DESNZ
	Establish plans for the new Local Authority Retrofit Scheme's design, including uprated cost caps, a challenge fund model, and enabled consortia-approaches						MHCLG & DESNZ
	Launch a sprint on data-matching for central government departments, local government and energy suppliers						DESNZ & Ofgem
	Quickly consult on relaxing stringent ECO eligibility requirements which are hampering delivery, including removing requirements for a 2-band EPC jump for ECO4 from 2025/26						DESNZ
	Combine and extend future supplier obligation into one scheme from 2026/27						DESNZ
	Review the mechanism for suppliers to collect customer contributions						DESNZ
	Consult on a methodology for devolved funding settlements for local authorities in future						MHCLG & DESNZ
Prime the market to unlock private finance	Set out how much funding government grants will receive from the unallocated £6.6bn funding pot						HMT & DESNZ
	Establish eligibility for the new Energy Efficiency Grant (EEG)						DESNZ
	Establish plans for promoting the EEG with public information campaigns from NHUP						DESNZ
	Consider whether home retrofit should be included in the National Wealth Fund portfolio						HMT
	Work with high street banks and the UKIB to launch government-backed interest free loans and develop clear consumer information on loan terms						DESNZ
	Launch government-backed zero-interest loans						DESNZ
	Develop clear plans on how BUS should ramp down in line with cost reductions from CHMM						DESNZ
	Explore tax incentives to maintain an attractive financial proposition for homeowners, particularly as grants ramp down over time						HMT, DESNZ
	Continue to review alternative private finance methods of property-linked finance, Energy/Heat as a Service and on-bill financing						DESNZ
Grow the Home Upgrade workforce	Consult on a mandate to require all heat pump engineers to be Level 3 MCS accredited						DfE
	Local authority procurement frameworks require tier 1 contractors to train SME subcontractors on the future of heat						Local authorities
	Require colleges and Gas Safe certification to include clean heat training in their existing gas and plumbing courses						DfE
	Ensure wider apprenticeship reform increases apprentices in retrofit and clean heat						DfE

Note: Dark orange represent policy decisions/implementation and light orange represent developing plans and consultation. Dark green represents secondary legislation.

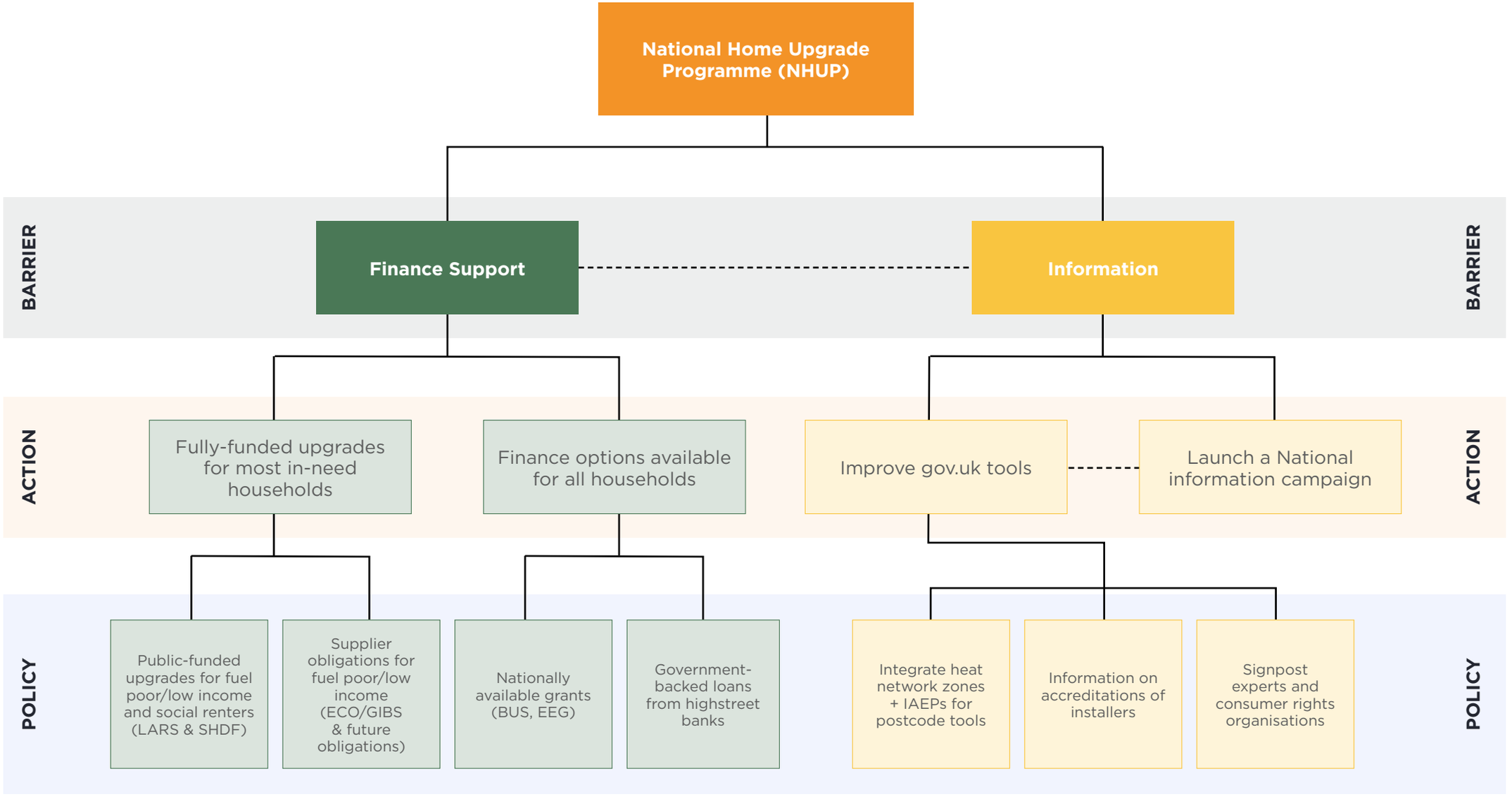
Annex

Table 8: Assumed baseline of the already planned £6.6bn which the Labour government has pledged to double, in line with the previous government's allocated funding, for 2024/23-2028/29 parliament.

		Parliamentary term						
	Funding (£bn)	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	Delivery body	Beneficiary
Social Housing Decarbonisation Fund	2.2						Local/combined authorities and social housing providers	Social renters
Home Upgrade Grant 2	0.32						Local/combined authorities	Fuel poor/low income households
Local Authority Retrofit Scheme	0.66						Local/combined authorities	Fuel poor/low income households
Energy Efficiency Grant	0.53						DESNZ	All eligible households
Boiler Upgrade Scheme	2.21						DESNZ	All eligible households
Green Heat Network Fund	0.64						Industry	Heat network residents
Heat Network Efficiency Scheme	0.06						Industry	Heat network residents
Heat Pump Investment Accelerator	0.015						Industry	Manufacturers
Energy Company Obligation 4	2.18						Energy suppliers	Fuel poor/low income households
Great British Insulation Scheme	0.66						Energy suppliers	Fuel poor/low income households
Total	**6.6**							

Note: The baseline of planned funding (£6.6bn) that the Labour government pledged to double assumes schemes running throughout the parliament are continued until the end of the term. Orange schemes are government funded, green schemes are supplier obligations levied on energy bills. Darker colours represent allocated funding for existing schemes. Lighter colours represent assumed continuation/ introduction of schemes.

Figure 17: National Home Upgrade Programme structure



A note on methodology

Public opinion research

Poll. A nationally representative 4,028 sample of UK adults. Fieldwork dates: 17th April - 30th April 2024.

Focus groups. Six with the general public and two with tradespeople. Fieldwork dates: Monday 15th January 2024; Wednesday 17th April 2024; Wednesday 24th April 2024; Thursday 16th May 2024.

Data and economic modelling

Part 1.2. Emission deciles of fuel poor and non-fuel poor households. Part 1.2. Emission deciles of fuel poor and non-fuel poor households. Public First analysed official English Housing Survey panel data accessed from UK Data Service for the most recent fuel poverty housing stock dataset (2021).[102] Carbon emissions of a property were estimated using open source EPC data on the average emissions of a property based on its fuel type, heating system and EPC rating.[103]

Part 2.2. Rebalancing levies. Public First estimated the impact of moving electricity policy costs of FiT, RO and ECO to gas bills and taxation using Ofgem data on policy costs per kwh, typical household consumption and energy costs.[104] Assumptions on energy costs are in line with the price cap for April 2024. The analysis was repeated for Ofgem Consumer Archetypes to understand the distributional impact on different consumer groups.[105]

Part 2.3. Estimated underspend of local delivery schemes. Public First estimated the government spend per scheme using official DESNZ statistics on the average government spend per measure and the number of measures installed.[106] Administrative costs were assumed to be an additional 15% of spend, in line with scheme guidance. Our analysis focused on Local Authority Delivery Scheme (Wave 1-3) and Home Upgrade Grant (Wave 1) as further schemes did not provide a breakdown of spend between government and housing providers. Figures are presented in their nominal values. We then estimated the number of homes this could have upgraded to EPC C based on the on average costings from the English Housing Survey energy report 2021 to 2022 and official MHCLG data on EPC ratings per local authority. [107] [108]

Part 2.4. Heat pump installations by estimated funder. Public First estimated how many heat pumps were installed through existing government schemes and other private sources in 2023 using: the total number of residential heat pumps installed

102 MHCLG, English Housing Survey, UK Data Service, [Accessed March 2024].
103 MHCLG, Energy Performance of Buildings Data: England and Wales, [Accessed January 2024].
104 Ofgem, Retail Market Indicators, [Accessed April 2024]
105 Centre for Sustainable Energy, Ofgem energy consumer archetypes update 2024, February 2024
106 DESNZ, Green Homes Grant and Home Upgrade Grant statistics, June 2024.
107 MHCLG, English Housing Survey 2021 to 2022: energy, July 2023.
108 ONS, Energy efficiency of Housing, England and Wales, local authority districts, October 2022.

in England from MCS data dashboard[109]; and official DESNZ statistics on measures installed through Social Housing Decarbonisation Fund, Home Upgrade Grant, Local Authority Delivery Scheme, Boiler Upgrade Scheme and Energy Company Obligation for 2023.

Part 3.1. Impact of planned and additional funding by scheme.

Public First undertook analysis of direct household schemes running throughout the new parliament that could contribute to upgrading homes in line with statutory targets. These include Social Housing Decarbonisation Fund, Local Authority Retrofit Scheme, Boiler Upgrade Scheme, and the Energy Efficiency Grant. The analysis combined official statistics and industry data to estimate the costs and benefits of allocating additional funding to these scheme to reach statutory targets this parliament.

- Table 4. To estimate the per spend effectiveness of each scheme, we used official department statistics DESNZ and DBEIS, providing cost benefit breakdowns for each scheme. This included cost and the number of homes treated, the type of measure and, where available, the lifetime carbon savings and annual energy bill savings. Where official statistics were missing data, we made the following assumptions.

- Given that the Local Authority Retrofit Scheme (LARS) has not yet launched, estimates were modeled on official statistics from Local Authority Delivery Scheme and Home Upgrade Grant, as LARS is expected to replace both of these schemes.[110]
- Boiler Upgrade Scheme (BUS) carbon savings were estimated using British Gas calculations for annual carbon savings for each outgoing fuel source (gas, oil, LPG etc.).[111] Using official statistics on the proportion of homes treated by fuel source, and assuming a heat pump's average life span to be 40 years, we were able to estimate the total carbon savings of the BUS.
- Given that the Energy Efficiency Grant (EEG) has also not yet launched. Therefore, in line with initial proposals, we assumed it funds cavity wall and loft insulation. We do not include radiator replacements due to the limited data available on its impact. Using, the English Housing Survey, we identified the proportion of homes that would be eligible for cavity wall or loft insulation, and the property types of these homes.[112] Then, using cost and savings estimates for each property type from the Energy Savings Trust[113], we calculated the expected carbon and bill savings along with the cost. Our estimates assume the scheme would provide up to a £3,000 grant towards these improvements.

- Table 5. Targets for each scheme are estimated based on the number of households that would need to be treated to achieve relevant existing government targets for England.

109 MCS, *The MCS Data Dashboard*, [Accessed June 2024].

110 DESNZ, *Green Homes Grant and Home Upgrade Grant statistics*, June 2024.

111 British Gas, *Carbon Cruncher: Calculating Heat Pump Emission Savings*, [Accessed June 2024].

112 DLUHC, *English Housing Survey*, UK Data Service, [Accessed March 2024].

113 Energy Saving Trust, *Roof and loft insulation*, [Accessed June 2024]. Energy Saving Trust, *Cavity wall insulation*, [Accessed June 2024].

- Social Housing Decarbonisation Fund (SHDF) target assumptions relate to fuel poverty targets to upgrade as many fuel poor homes as possible to EPC C by 2030 and wider targets to upgrade as many homes as possible to EPC C by 2035. We also account for supplier obligation delivery, subtracting the estimated upgrades in England from ECO and GBIS in the social rented sector.

- LARS target assumptions relate to fuel poverty targets to upgrade as many fuel poor homes as possible to EPC C by 2030. To avoid overlap with SHDF, we estimate that LARS would need to upgrade all fuel poor private-rented and owner-occupied homes, proportionate to the delivery required this parliament. We also account for supplier obligation delivery, subtracting the estimated upgrades in England from ECO and GBIS in the private-rented and owner-occupied sector.

- BUS target assumptions are based on the government target to install 600,000 heat pumps a year by 2028 in the UK with continued growth to 2029 (200,000 of which are expected to be in new builds and not eligible for BUS funding). [114]Our analysis adjusts the target for England and Wales only in line with the scheme's eligible geography and for the proportion of installations that would likely come through BUS [See heat pump installations by estimated funder above].

- EEG target assumptions are based on the Labour government's 2024 manifesto to upgrade 5 million homes and existing targets to upgrade as many homes as possible to EPC C by 2035. To calculate this, we estimated the proportion of homes that require either loft or cavity wall insulation that are not in fuel poverty using English Housing Survey panel data. [115]

114 National Audit Office, Decarbonising home heating, March 2024

115 MHCLG, English Housing Survey, UK Data Service, [Accessed March 2024].

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