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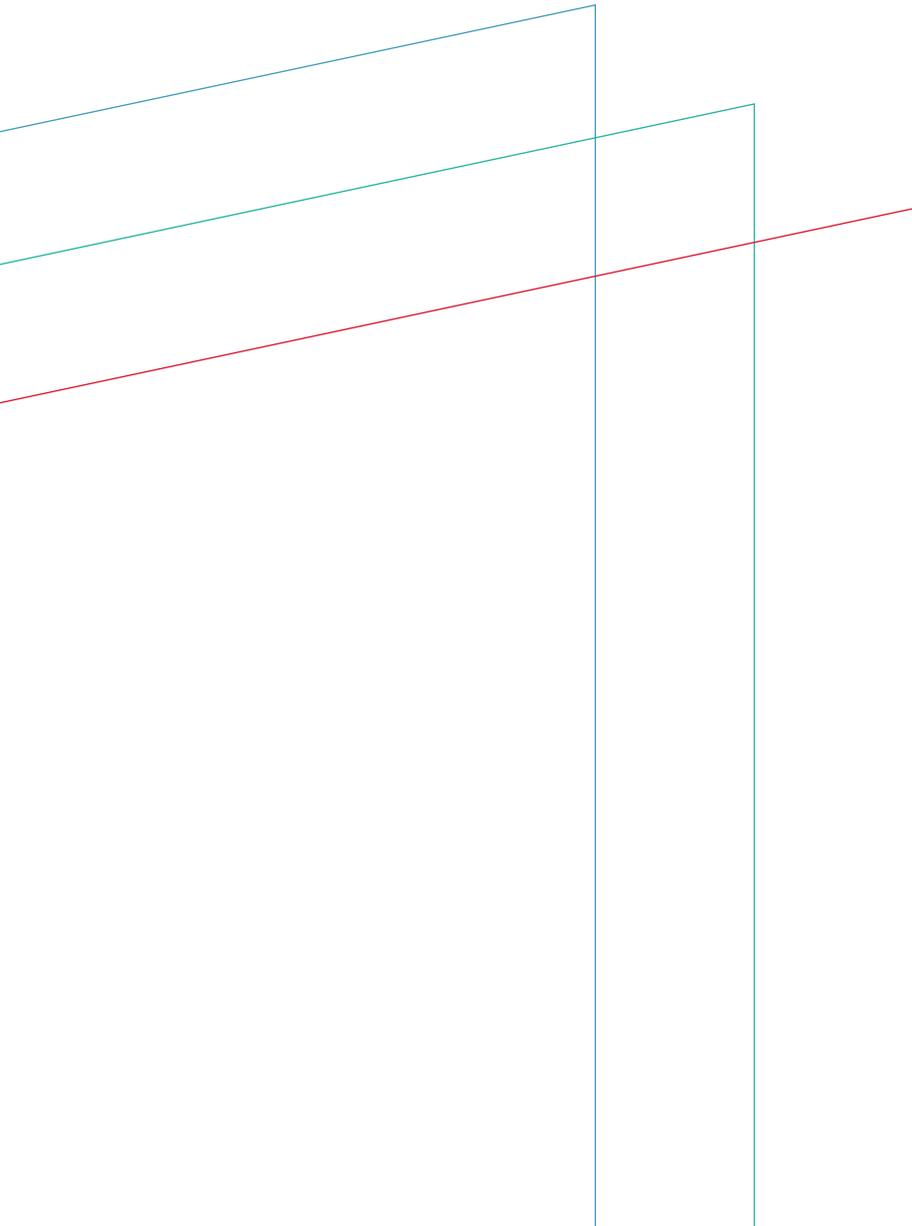
A BLUEPRINT FOR WARMER HOMES

HOW TO DELIVER A
RETROFIT REVOLUTION

WRITTEN BY: CHAITANYA KUMAR,
CHRISTIAN JACCARINI, AND PAULO YUNDA

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1. EXECUTIVE SUMMARY

Decarbonising the UK's homes is an immense challenge, often described as the biggest infrastructural undertaking of the 21st century. According to estimates from the Climate Change Committee (CCC), approximately £315bn in funding is required to achieve the necessary upgrades. A portion of this funding must be publicly sourced, and the new Labour government has pledged £13.2bn over the current parliamentary term for energy efficiency and low-carbon heating initiatives.

This report explores the optimal allocation of this funding and provides a set of value for money (VfM) principles that should underpin the government's Warm Homes Plan. We argue that a successful Warm Homes Plan requires stable, needs-based funding and a robust local delivery model. Rather than relying on competitive bidding, a needs-based funding system should provide long-term, predictable financial support for local authorities to lead retrofit initiatives. This approach aims to strengthen the capacity of local governments to deliver tailored, community-specific retrofit solutions, fostering long-term economic growth and supporting a sustainable transition to a low-carbon future.

Funding and financing are critical components of this programme. In this report, we model three scenarios: the baseline scenario with £13.2bn over five years and a new loan scheme for able-to-pay households; a similar public spending scenario with reduced interest rates on lending; and a scenario with a £30bn commitment over five years with low-cost lending, acknowledging that even with the best of intentions, current budgets for public investment will be inadequate to meet the decarbonisation challenge. Interest rates significantly impact these models, as many home upgrades are expected to be funded by zero-interest loans in our modelling.

We argue that tackling fuel poverty should be central to the Warm Homes Plan. In our baseline

scenario, 390,000 fuel-poor households will be upgraded in the first two years, increasing to 1.27m by year five, incorporating low-carbon heating measures like heat pumps and solar thermal systems alongside basic retrofit measures. Over a decade, just over half of the UK's approximately 4.4m (2.26m) households in fuel poverty (as of 2022) will receive deep retrofit measures. This includes most social housing occupants in fuel poverty and just under two-thirds in the private rented sector. With an estimated £22.7bn in grant expenditure, the government could enable £37bn in capital expenditure on retrofitting fuel-poor homes over ten years.

The strategy is also poised to boost economic growth, with every £1 of public investment estimated to generate £4.60 in capital expenditure and £6.90 in broader economic activity. This economic stimulus will support the creation of thousands of green jobs and contribute to a robust supply chain for retrofitting services.

We make the following recommendations to the government:

- **Establish a national homes upgrade unit (NHU)** Create a central body to coordinate efforts, provide guidance, and ensure efficient delivery of the Warm Homes Plan.
- **Adopt a needs-based funding model:** End competitive bidding for retrofit funding. Introduce long-term, needs-based funding to support area-based delivery and increase the Warm Homes: Local Grant's allocation beyond the existing £88m.
- **Empower local authorities for area-based delivery:** Enable councils to develop long-term capabilities for delivering retrofit – supporting local supply chains, reducing costs through economies of scale, and increasing community engagement.
- **Introduce new loan schemes for able-to-pay households:** Launch low- or zero-interest loans through the UK Infrastructure Bank, now the National Wealth Fund (NWF), allowing middle-income households to access affordable financing for home upgrades. Concurrently, consider a targeted term funding scheme to provide low-cost, long-term financing for

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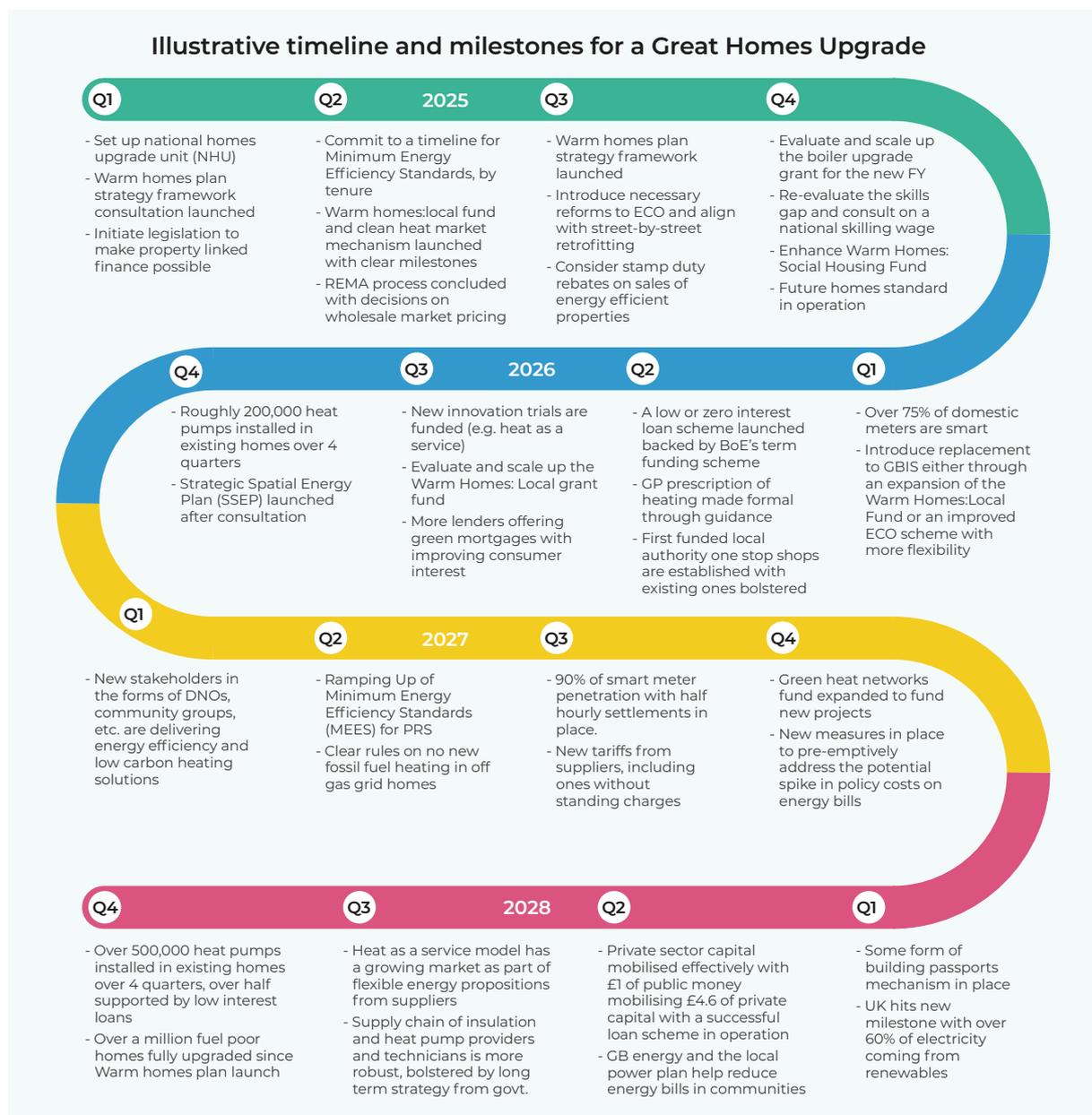
retrofit investments. This approach would offer affordable credit to banks and lenders on the condition that the funds are used exclusively for home energy efficiency projects. By aligning the cost of capital with retrofit goals, the Term Funding Scheme (TFS) can reduce borrowing costs for households and local authorities. If the government introduces dual interest rates, such that it reduces the cost of capital by 2 percentage points below the UK Investment Bank (UKIB) (now NWF) lending rates, then the government can enable £62bn of investment with £3bn of interest spending over ten years

- **Prioritise workforce development:** Implement a large-scale training programme for retrofit jobs,

ensuring a skilled workforce to meet growing demand and supporting a strong green job market.

The home retrofitting programme outlined in this report presents a ‘starting gun’ strategy for Labour’s Warm Homes Plan. By addressing financial and practical challenges through coordinated national efforts, targeted funding, and robust training programmes, the UK can make significant progress in decarbonising homes, achieving climate goals, and providing significant economic benefits.

We now sketch out what a ten-year retrofit programme could look like in the first few years with key decisions and milestones.



2. INTRODUCTION

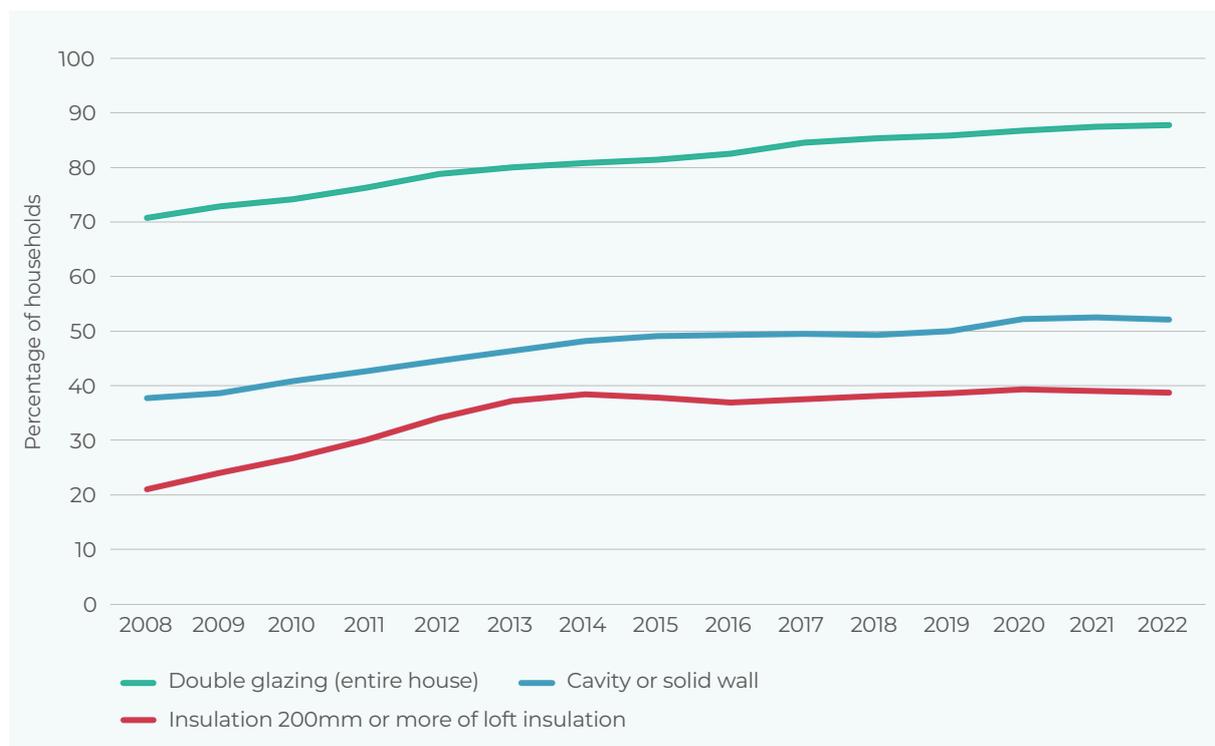
The cost of living and energy crisis of the last three years has brought into sharp relief the importance of upgrading our leaky housing stock. Households across the country lose millions of pounds to heat loss every year while not achieving the level of warmth and comfort necessary for healthy living. In fact, fuel poverty figures reached record highs over the past 24 months and currently stand at 6m households according to the National Energy Action.^a The winter of 2022–23 saw excess winter deaths mounting to 4,950 because of cold homes and fuel poverty.¹

The response from the previous government to the crisis was primarily to shield households through the Energy Price Guarantee (a cap on unit energy prices) alongside a set of measures targeted at specific households. Though it brought short-term

relief to many households, the rise in inflation rapidly outstripped any rise in income. Short-term support from the government was not followed by efforts to address the systemic issues underpinning our current energy crisis: our over-reliance on fossil fuels, a weak welfare system, and a draughty housing stock.

Since 2012, the proportion of households that are within the energy efficiency rating (EER) bands A–C has gone up from 19% to 48%.² This is welcome progress, but the pace of improvements has begun to stall at the very moment when it needs to quicken.³ First, the efficiency improvements over this period have done little to take households off gas as they’ve largely relied on the installation of more efficient condensing combination (or combo) boilers. Second, improvements to the fabric of the house, such as cavity, external wall, and loft insulation measures have plateaued. This is shown in figure 1 below. Just over half (52%) of all dwellings had cavity or solid wall insulation (up from 45% in 2012) and 38% had 200mm or more of loft insulation (up from 34% in 2012).⁴

FIGURE 1: INSULATION MEASURES, 2008 TO 2022



Source: English Housing Survey 2022–23

^a This is based on a different definition of fuel poverty than the government’s and considers any household that spends more than 10% of its disposable income after housing costs on energy. <https://www.nea.org.uk/energy-crisis/>

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NEF's analysis of recent government data revealed that insulation measures fell by over 40% in the last 12 months of 2023 compared to the year before.⁵ Flagship schemes such as the Energy Company Obligation (ECO) and the Great British Insulation are struggling to deliver the numbers necessary to meet our climate targets. The Climate Change Committee (CCC) modelled the need for delivering 2.9m insulation measures between 2020 and 2023, but the government has managed to only reach 15% of that target in this period.

A business-as-usual approach will do little to accelerate the rollout of energy efficiency measures across the UK. Piecemeal schemes with arbitrary timelines and limited budgets have been a central issue affecting the slow delivery of insulation measures. The lack of an effective public communication strategy, trusted delivery bodies, high-performance standards, reduced hassle for householders, and a skilled workforce have all contributed to slowing progress in this policy area. Improving the efficiency of the housing stock has proven to be a *wicked* problem with several variables under consideration. However, the transition to net zero is unlikely to be achieved without finding a way out of this problem.

Some have suggested that a focus on fabric improvement measures has been overblown and the government should instead focus its efforts on scaling heat pump rollout. It is worth noting that heat pumps in themselves contribute to an improved efficiency of a property considering how effective they are in converting one unit of input energy (electricity) into four to six units of usable output (heat). However, fully shifting away from fabric measures would limit the potential savings that can be achieved from a dual pursuit of low-carbon heating and basic insulation measures.

It would also amount to admitting defeat when government policy has failed to address the multiple challenges associated with home retrofitting. This report shifts the focus away from current policy approaches for retrofitting towards a local institution-led delivery model that centres on local authorities and community groups. We believe that a sustainable energy efficiency policy needs more than long-term finance and policy certainty; it also needs a local delivery framework that can fully capture the multiple co-benefits of energy efficiency.

3. THE NEED FOR A LOCAL DELIVERY FRAMEWORK

The net zero challenge is in many ways an infrastructure investment challenge – a huge amount of investment is needed to meet our legal obligations and transition to a net zero future. Who funds this, and how the rewards are shared, will be key in determining whether net zero transition is fair and just. Increasingly, policymakers are considering the spatial dimensions of this investment.

In this report, we outline the key components of a local delivery framework, which we believe is necessary for the following reasons.

1. THE INFRASTRUCTURE NEED IS DISTRIBUTED ACROSS THE COUNTRY

A large portion of Great Britain's 29m dwellings and 27.3m households will need to be upgraded.^{6,7} This means homes in almost every neighbourhood will require a facelift. The need is inherently local. The diversity of the housing stock, in terms of quality, tenure, type, and build age, also necessitates more localised approaches to retrofitting.

Local governments, owing to their proximity to constituents, allow for a nuanced understanding of regional needs and priorities, enabling tailored solutions that a one-size-fits-all approach from higher governmental levels cannot achieve. This can pay dividends. A recent appraisal of the economic costs of net zero across six city regions found that place-based delivery requires only 25% of the investment of a place-agnostic approach and creates about twice the level of energy cost savings and social benefits.⁸ As the report states,

"The opportunity to deploy measures which are large in scale and diverse in scope relies heavily on local factors. Some low carbon measures meet a decarbonisation need for many people ('economies of scale', e.g. heat networks), or concurrently meet many decarbonisation needs ('economies of scope', e.g. whole-house retrofit), or do both. These opportunities are often more place-specific than individual low carbon measures. For example, district heat networks are most viable in dense urban areas and where there is an existing waste heat source. As a result, there is greater regional variation in the opportunities to deploy larger, more economical low carbon measures than for individual measures."

2. THIS WORK NEEDS TO HAPPEN AT PACE AND EXISTING MEASURES ARE FALLING SHORT.

Home energy efficiency measures are a key component of the UK's policies to cut carbon emissions to net zero by 2050. According to the government's climate advisors, the UK should have installed around 2.9m insulation measures between 2020 and the end of 2023. NEF analysis found a massive gap between these targets and reality: just 464,982 energy efficiency measures were installed between the start of 2020 and autumn 2023, across the government's landmark schemes.^b This represents just 15.8% of the installations needed.

In its most recent progress report,⁹ the Climate Change Committee (CCC) was clear that current policies will not deliver on legal targets and that significant new policies and programmes are needed to underpin the delivery of low-carbon heat and energy efficiency. Analysis by Green Alliance indicates that confirmed government policy only addresses 10% of the total emissions reductions that the UK must legally make in heat and buildings by 2032, with an additional 33% covered by policies under consultation.¹⁰

A wholly localised approach to home retrofitting is not a panacea and as we describe in the following sections, the new government should maintain (but rationalise) existing centralised schemes but significantly enhance support for local-government-led delivery that has proven to be effective in identifying and targeting retrofit measures.¹¹

^b January 2020 to November 2023 for LAD, HUG and SHDF, January 2020 to September 2023 for ECO.

3. NEW "LOCAL GROWTH PLANS" PRESENT AN OPPORTUNITY.

Local authorities have already been delivering on retrofit for years and have a range of existing duties that mean they are well placed, if properly funded, to deliver on a national retrofit mission. As recognised in the National Audit Office's *Achieving Net Zero* report, "local authorities will be key in the achievement of emissions reductions in the transport and housing sectors locally where the decarbonisation challenge will vary by location."¹²

Many local authorities are endeavouring to deliver on ambitious climate targets, but that level of ambition is not yet fully supported by the new government. What is missing is a framework and ecosystem that enables action on these ambitions. This should include cross-departmental political commitments, a coherent national plan designed with local authorities, non-competitive funding, appropriate finance for retrofit works, and comprehensive investment in local government skills and capacity.

When working in a coordinated way to deliver, distributed leadership allows for problem-solving and innovation to be enhanced by local expertise and networks. This involves using resources, aligning goals, and sharing best practices to tackle both the supply and demand sides of the equation efficiently. The new Labour government has espoused the devolution agenda and has also published its *Industrial Strategy* green paper, identifying "clean energy industries" as one of its eight growth-driving sectors.¹³ Home retrofitting should feature as a key pillar of the proposed Local Growth Plans and industrial strategy with an opportunity to scale up domestic heat pump manufacturing and standardised retrofit installers.

4. RETROFITTING HOMES CAN CREATE GOOD, LOCAL JOBS IF DONE RIGHT.

The rise of precarious work over the past two decades alongside a rise in labour inactivity has brought a renewed focus to the goal of increasing the supply of *good jobs* under the banner of productivity.¹⁴ This is not new thinking; trade

unions have long bargained to make work pay, and social economy advocates have pushed for organisational structures – such as cooperatives and social enterprises – that look to end the bifurcation of doing well and doing good.

For instance, the USA's Inflation Reduction Act (IRA) and the EU's Green Deal are both prime examples of policy interventions to create productive, local jobs in targeted areas. The IRA targets spending on "energy communities", defined as those with significant brownfield sites, coalfield communities, high fossil-fuel employment, and higher-than-average unemployment rates.¹⁵

Given the UK's serious spatial inequalities that see men in the most deprived parts of Blackpool living ten years less on average than those in parts of Wokingham or Hampshire, it's clear that place-based thinking needs to be part of the solution.

The nascent retrofit sector is well suited to this agenda. It could be shaped into a sector that provides good, green jobs for years to come, helping to address spatial inequalities by ensuring that the installation of energy efficiency measures in homes is undertaken by social and solidarity economy businesses rooted in communities across the country. We argue that a local delivery framework can enable this.

The scale and pace of the transition needed have not been seen since the 1960s and 1970s when a decade-long programme of home upgrades led to a wholesale conversion of the country from using town gas to natural gas.^c Some 13.5m homes and 650,000 commercial and industrial buildings needed an upgrade to their heating systems and appliances alongside a significant build-out of new pipeline infrastructure to transport gas that we still rely on today.¹⁶ The success of that transition was primarily down to effective public communication, a national coordination body at the central government level, and a set of regional energy boards responsible for overseeing the nuts and bolts aspect of the conversion process. This was encapsulated within a mission-led approach that was appropriately noted as the "greatest peacetime operation in the nation's history".¹⁷

^c "Town gas" was manufactured in power plants, most often from coal. This is unlike natural gas that was extracted from reserves such as that in discovered in the north Sea in the 1950s.

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The transition to net zero presents a unique set of administrative challenges when it comes to home upgrades. A much larger population than we had in the 1970s and the privatisation of the energy market has generated a complex set of incentives that are more difficult to manage. The ongoing debate on hydrogen vs heat pumps is a case in point where the incentives for the natural gas industry are at clear odds with the objective of decarbonisation.^d

The town gas to natural gas conversion is a useful reminder of the possibility of rapid transitions.

^d The natural gas industry has been arguing for hydrogen to form the backbone of the country's heating needs. This sustains both the existing infrastructure in the form of natural gas pipes across the country and the use of gas in producing hydrogen. However, several studies have highlighted the inefficiency of H₂ as a viable heating solution and the new Labour government is likely to disregard H₂ as a potential.

4. UNLOCKING FINANCE THROUGH A VALUE FOR MONEY APPROACH

Decarbonising the UK's homes is a sizeable challenge with some describing it as the biggest infrastructural challenge of the 21st century. To meet the challenge, a simplified, long-term funding landscape is required, from which supply chains and local skills can be built and private finance and economies of scale can be coordinated. The current funding landscape is complicated and inefficient for local authorities. For instance, local authorities could deliver on retrofit through eight different schemes, many of which have multiple competitive funding rounds. This is set to change with the Warm Homes: Local Grant from April 2025 that does away with competitive bids but is starting with a considerably small budget of £88m.

In 2020, the Climate Change Committee (CCC) estimated that it would cost around £250bn to retrofit UK homes in line with our carbon budgets.¹⁸ Costs have risen since, and we estimate that this figure is equivalent to £315bn in 2025 prices. A share of this will need to be publicly funded, but existing government funding is insufficient to enable the transformative shift needed in the built environment. The new Labour government committed to a capital allocation plan of £13.2bn over the course of the parliament, roughly one-third more than the Conservatives.¹⁹ Considering this reduced fiscal commitment and acknowledging the poor legacy of existing schemes, the Labour government should apply a strong value for money (VfM) approach to retrofit spending.

VALUE FOR MONEY PRINCIPLES

It is highly unlikely, even undesirable, to seek public investment to fund the entirety of the home retrofit programme. Leveraging private finance from public investment remains a crucial aspect of achieving

the necessary and urgent scale of retrofitting. Chancellor Rachel Reeves claimed that her party will seek to leverage £3 in private capital for every £1 of public money invested from their proposed National Wealth Fund (NWF).²⁰

Such precise multipliers are hard to adhere to but below we outline nine principles of a VfM approach to retrofit funding and finance. In summary:

- VfM Principle 1: Use retrofit to boost the incomes of the fuel poor, considering both funding and bill savings.
- VfM Principle 2: End competitive funding and replace it with needs-based funding.
- VfM Principle 3: Provide long-term funding to reduce inflationary impacts and enable better planning.
- VfM Principle 4: Design grants and financing to enable area-based retrofit.
- VfM Principle 5: Build local government capacity and expertise to support deliverability.
- VfM Principle 6: Combine decent homes and decarbonisation budgets, giving local authorities and social housing providers finance and capacity to deliver.
- VfM Principle 7: Use low- or zero-interest lending to households as part of a package to stimulate activity in the non-fuel poor.
- VfM Principle 8: Link debt to properties to make repayments affordable.
- VfM Principle 9: Move beyond disclosures to align finance with government's missions.

Table 1 provides a summary of the investment commitments the Labour Party has made so far in the six months since taking office. Besides the introduction of the Warm Homes: Local Grant, no new funding schemes have been announced and existing schemes such as the Energy Company Obligation (ECO) and the Boiler Upgrade Scheme (BUS) have been boosted with more resources. The estimated rise in home upgrades for 2025–26 is considerably lower than what is needed to meet

TABLE 1: A SUMMARY OF THE KEY INVESTMENT PROGRAMMES COMMITTED TO BY THE NEW LABOUR GOVERNMENT

Scheme/Initiative	Coverage	Budget/ Investment	Estimated number of Homes Upgraded (2025–26)	Number of Homes Upgraded (2023–24)	Notes
Warm Homes Plan (2025–28)	UK-wide	£3.4bn (2025–28), £1bn allocated to 2025–26	Up to 300,000 (total)	120,000 (total)	The total investment includes multiple initiatives and funding sources
Warm Homes: Social Housing Fund, ending on 31 March 2026	UK-wide	£374m (2025–26) + £600m–£700m co-funding from social housing providers	Up to 60,000 (through grant funding and co-funding)	25,000 (via grant funding and co-funding)	Co-funded with contributions from social housing providers
Warm Homes: Local Grant Ending on 31 March 2028	UK-wide	£88m (2025–26)	Up to 9,000	N/A	Supports local authorities to upgrade their local housing stock with specific eligibility criteria.
Boiler Upgrade Scheme, ending on 31 March 2028	UK-wide	£295m (2025–26)	Up to 39,000	14,000 (included in Boiler Upgrade Scheme total)	Part of the wider Boiler Upgrade Scheme
ECO4 and Great British Insulation, ending on 31 March 2026 Scheme (2025–26)	UK-wide	£1.4bn–£1.6bn (2025–26)	Up to 200,000	80,000	Supplier-led initiative, supported by ECO4 and GBIS

our carbon budgets. Ensuring value for money from these investments, introducing alternative finance mechanisms, and gradually ramping up the capital allocation behind these schemes will be critical in closing the gap to the CCC’s pathway.

VfM Principle 1: Use retrofit to boost the incomes of the fuel poor, considering both funding and bill savings.

Fuel-poor households are those unable to afford adequate heating, cooling, and other essential energy services without compromising other basic needs. There are various ways of defining this and this figure is highly susceptible to changes in energy costs. National Energy Action estimates that 6m households are fuel poor (as of 1 April 2024)

across the UK while the official definition of fuel poverty shows an estimated 4.4m households.

For these households, it is particularly important that decarbonisation is not a burden. Instead, retrofitting homes should boost their disposable incomes. This is not only because their health and wellbeing are more substantially impacted by increased incomes, but also because their likelihood of spending this money is substantially higher. A recent study from the Bank of England found that financially stretched households are 20% more likely to spend extra income²¹ than those that are not, making the economy-wide gains of lower energy bills the largest for this group. If the government wants to stimulate economic activity²² while delivering the greatest value for money, it must take this seriously.

At the height of the energy crisis in 2022, modelling showed that upgrading homes to an energy performance certificate (EPC) C would have resulted in an average annual bill saving of £779 but for the worst performing homes currently at EPC F and G, this could have meant an average saving of £4,464 or more per year.^{e,23} To support improved living standards through higher economic activity, the financing should ensure that all but the richest households benefit financially from government grants, with fuel-poor households prioritised.

Effectively boosting incomes for the fuel-poor means grants should be the primary way of funding retrofit for these households.

Warm Homes: Social Housing Fund, Warm Homes: Local Grant, ECO4, and the Great British Insulation schemes are targeting fuel-poor homes and those on certain means-tested benefits. That principle *must* be maintained, with some flexibility. However, the schemes' capital allocation must also be scaled up significantly. Schemes related to domestic retrofit are currently worth around £2.9bn–£3.3bn in public funding a year.^f When considered alongside the limited private or public credit, the current policy pathway is inadequate to meet the scale or pace of investment needed.²⁴

Our illustrative modelling suggests that with Labour's commitment of £13.2bn of central government funds invested over five years, 40% of all fuel-poor homes in social housing and nearly 30% in the private rented sector could be upgraded to EPC C alongside the installation of heat pumps. This relies on over 90% of the proposed allocation going towards fuel-poor properties in the first five years.

We discuss the results of further modelling in the following section.

VfM Principle 2: End competitive funding and replace it with needs-based funding.

Some local authorities supplement grants with their own funds, seek private investment (from households), and combine delivery with the energy-supplier-led ECO scheme. Still, the bulk

of publicly led capital investment depends on regularly bidding for central government funding pots. The time and effort required to bid for competitive funding is considerable and acts against best value. A recent Freedom of Information request showed that local authorities spent at least £27m preparing bids for various levelling up funds.²⁵ One county council recently spent £1.2m on five unsuccessful bids, alone.²⁶ When you consider that this is just one of many, many funding pots, the scale of the inefficiencies becomes clearer.

Not only is it a waste of public funds, but competitive bidding also entrenches inequalities. As highlighted by the CCC, "Funding competitions are problematic, focusing resources into the local authorities with sufficient staffing and capacity to apply for funds, often at short notice."²⁷ It also encourages short-termism and top-down approaches rather than community engagement and long-term planning,²⁸ all things we will need if we are to fairly decarbonise homes.

Instead, local government requires funding that aligns with local housing and socio-demographic conditions. This should be determined by the local government working with housing stock modelling experts to complete an assessment and use this as the basis for drawing down government funding. Funding will also need to be provided upfront to contract external expertise and expand the local government's currently threadbare capacity for non-statutory services.

VfM Principle 3: Provide long-term funding to reduce inflationary impacts and enable better planning.

The short time horizons of most existing funding schemes also present a problem. Even when bids are successful, many of the current funding rounds require councils to spend the money within a one- or two-year period. This leaves them hostage to underdeveloped supply chains and drives up prices as councils are forced to compete for limited delivery capacity. Some councils are now exploring how they can work together to manage supply chains, but this remains far from optimal.²⁹

^e This is likely an upper end estimate of the average savings, given the analysis was undertaken during an energy price spike

^f NEF analysis. Note the range comes from the exclusion of the Public Sector Decarbonisation Fund, which is primarily targeted at non-domestic buildings.

The largest and longest-running scheme is ECO. It is now in its fourth iteration (ECO4), having run since 2013 and installed energy efficiency measures in 2.4m homes.³⁰ The scheme targets fuel-poor households, using funding from energy suppliers indirectly paid for through energy bills.

The scheme does not always cover the full cost of the installation, meaning that the eligible household may need to contribute. Energy companies may choose which measures to fund, the level of funding that they provide, and the installer, with the potential for the level of the ECO grants to vary alongside these other factors.³¹ The fact that some tenants have to contribute to the cost of installations under ECO may make certain aspects of the scheme unavailable to those in fuel poverty.

Even though the installation of measures in low-income homes addresses inequalities through bill savings, funding this investment by levies on bills is regressive³² as low-income households spend a larger proportion of their income on energy bills, so any price rise affects them disproportionately. The burden would be distributed fairly if the funding was raised through income or wealth taxation. Still, the levy funding system for ECO has been a stable programme with consistent budgetary allocations – a rare source of stability for suppliers in a system where government policy has chopped and changed constantly.

ECO4 is delivering a lower number of installations than previous iterations, meaning we are veering away from the CCC's pathway projections. Energy companies are struggling to find households that meet the scheme's minimum requirements and installation cost assumptions within the ECO4 impact assessment do not reflect current market conditions.³³ These issues highlight the problems caused by the short-term, unplanned approach to decarbonisation that previous governments have pursued, alongside broader challenges such as rising material costs and inflation, which cannot be rectified by looking at ECO4 alone. Still, the scheme can be revised to ease immediate pressures.

The Labour government should make a long-term fiscal commitment to fund ECO itself, making use of the supply chains and delivery capacity that the energy companies have developed. In addition, it

should widen eligibility criteria over the short term to support area-based efforts, while investing in supply chain capacity. No new gas boilers should be installed as part of ECO, reducing the cost of further retrofitting in the future.

Transparent, long-term funding that makes clear the required pipeline of work will give the private sector the confidence to invest in skills and capacity. It will also better enable local government to prepare how best to deliver the schemes, expanding the scope of ambition for more direct local authority interventions in supply, such as direct labour organisations.³⁴

VfM Principle 4: Design grants and financing to enable area-based retrofit.

Current schemes (eg WH:SHF,³⁵ ECO³⁶) allow for a certain proportion of grant funding to be spent on ineligible homes. This is helpful as it allows for some area-based delivery programmes. At its fullest, area-based retrofit can involve whole streets and neighbourhoods being upgraded together. This means they can benefit from economies of scale that reduce the cost per unit retrofitted, as well as better community engagement and increased uptake.³⁷ It also creates greater impetus to upgrade related infrastructure, such as heating systems or renewable energy systems at the same time.

To enable this most effectively, other funding solutions need to be available to households. We discuss in greater detail how a low-interest loan could be combined with grants-based retrofit schemes to reach a wider demographic.

VfM Principle 5: Build local government capacity and expertise to support deliverability.

In the face of the escalating climate crisis, the role of local governments in spearheading environmental initiatives has never been more critical. In a recent evaluation of the UK's progress towards net zero, the CCC found that 30% of emissions cuts depend on the actions of local government and that they have a significant degree of influence over other potential reductions.³⁸

While the role of local and regional authorities is considered critical, powers to make policy decisions remain largely centralised, and austerity measures have reduced authorities' capability and capacity to implement climate actions.³⁹ Local government spending power fell by 17.5% between 2009–10 and 2019–20, before partially recovering. This was driven by central government funding for councils being cut by 40% in real terms, decreasing from £46.5bn to £28bn. With higher business rates and council tax only partially offsetting the fall, councils are on the brink of collapse.⁴⁰

Funding is key here, but expertise is also needed. The UK has one of the largest and most developed financial centres in the world. The government should explore how it can bring this financial expertise into local authorities, considering secondment schemes and centres of excellence. This can help local authorities to deliver the greatest value for money, enabling them to more fully use lending as well as central government grants.

Local government capacity remains a binding constraint and one we need to be sure to break if we are to act at the scale and pace required. Expanding lending capabilities alone will not do. We know this as the UK Infrastructure Bank ((UKIB; now the NWF) reported that it was struggling to engage overworked council officers, meaning much of its dedicated £4bn lending facility, offering better rates than the Public Works Loan Board (PWLb), remains unused.

VfM Principle 6: Combine decent homes and decarbonisation budgets, giving local authorities and social housing providers finance and capacity to deliver.

Local government will need to lead on multiple fronts. Lower-tier authorities are social landlords and will need to retrofit their own housing stock. The scale of the social rented sector offers a valuable base to develop supply chains across the country. To fund this work, they are currently able to bid for a government grant from the Warm Homes: Social Housing Fund for homes below EPC C. Theoretically, they can also borrow against their rental income to invest and use the Repair

Maintenance and Improvement budgets to fund some retrofit work – however, the incentives around right to buy make this more challenging in practice.

Very little space remains in existing budgets to expand into retrofit, in part because between 2016 and 2020 rents in social housing were reduced by 1% each year, and because much of what remains is already being spent on other remedial work. This includes action on flammable cladding, toxic mould, and other essential upgrades to ensure that homes meet the Decent Homes Standard.⁵

Ten percent of socially rented homes are non-decent, and many of these are damp and mouldy.⁴¹ This acts as a barrier to action on retrofit. When faced with a choice between statutory upgrades to ensure homes are up to standard versus non-statutory targets for energy efficiency, social housing directors understandably often choose to act to meet the statutory targets. Both challenges intersect and should be understood as such. Action on retrofit can reduce the cold and damp spots where mould forms.⁴² As we move towards a regulatory landscape where energy efficiency and remedial work are recognised as part of the same challenge, so too should financial arrangements. This means ensuring the financial envelope available to local authority housing departments is adequate to address the multiple challenges.

VfM Principle 7: Use low- or zero-interest lending to households as part of a package to stimulate activity in the non-fuel poor.

The current targeting of most existing schemes and thereby the allocated budget on low-income and fuel-poor homes is the right thing. However, it is key that we go beyond this. The CCC identifies energy efficiency in non-fuel-poor homes as the most significant policy gap in the buildings sector.⁴³ The use of low- or zero-interest lending instruments will be critical.

There are different ways in which this can be achieved. Germany's KfW (*Kreditanstalt für Wiederaufbau* or Reconstruction Credit Institute), provides deep retrofit loans of up to €150,000 per

^g A benchmark established to ensure residential properties meet certain criteria for safety, state of repair, and provision of modern facilities and services, including adequate heating, sanitation, and insulation.

residential unit.^h,⁴⁴ The term of the loan is between 4 and 30 years, with the interest rate only being fixed for the first 10 years, after which there is a follow-up offer from the KfW Bank, which the borrower can reject or switch to another bank. The first one to five years are repayment-free, and there is also a repayment subsidy of 5%–25%, dependent on the energy reduction achieved by renovation and the inclusion of renewable energy generation.⁴⁵

The UKIB, now part of the NWF, could play a similar role, if expanded. With limited funding from the Treasury, interest-rate subsidies could make credit interest free. The cost of this could be brought down if monetary policy is better used to support the green economy.⁴⁶ This is discussed in more detail in VfM Principle 9. In our modelling, we estimate that this interest subsidy could be as low as £3bn over ten years to catalyse £62.2bn of investment.

Replacing Public Sector Net Debt as a binding fiscal rule with Public Sector Net Financial Liabilities (PSNFL) opens the ability of the NWF to provide a significant volume of loans to local authorities and directly to households. However, in an environment where departmental resource spending is constrained, allocating the costs of these loans to capital expenditure will be important. Furthermore, existing rules do not allow the NWF to issue its own bonds but empowering it to do so could potentially leverage up to £100bn in additional capital, based on its current capital allocation of £7.3bn.⁴⁷

To ensure that easy credit does not inflate costs, the lending should be contingent on energy savings achieved by the retrofit. This is analogous to the German KfW scheme, where the lending amount depends on the energy standard after the renovation.

A low-interest approach was launched in Ireland in 2024, where the Irish government, in collaboration with the European Investment Bank (EIB) Group, introduced a low-interest loan scheme for home energy upgrades. This allows homeowners to borrow between €5,000 and €75,000 at significantly lower interest rates than those currently available in the market.⁴⁸ The loans, which can be unsecured and span up to ten years, are aimed at facilitating energy efficiency improvements and renewable

energy upgrades in homes. The loans are also integrated with grants from the Sustainable Energy Authority of Ireland (SEAI) and aim to make the overall process of upgrading homes more accessible and affordable.

The interest rates will be significantly lower than those currently available on the market because of the combination of the EIB Group loan guarantee and a government-funded interest rate subsidy, to support a wide take-up.⁴⁹ Unlike the German scheme, homeowners apply for loans through participating retail lenders. Loan guarantees derisk investments for private investors by socialising risks while privatising the rewards. Direct lending meanwhile requires greater institutional capacity but avoids unnecessary rent extraction from private investors, thus keeping financing costs low, while also minimising the risk of moral hazard. These issues are explored in more detail in the NEF report *Greening Public Finance*.⁵⁰

The relatively short payback period under the Irish loan scheme remains a barrier to affordability, as monthly payments will necessarily need to be higher than they could be over a longer period. A solution to this is discussed in VfM Principle 9.

Other examples include Brussels, where low- and zero-interest loans are being offered for investments in home renewables,⁵¹ and Canada, where ten-year interest-free loans of a maximum of \$40,000 are offered.⁵²

VfM Principle 8: Link debt to properties to make repayments affordable.

In addition to ensuring the quantity of credit available for retrofit is commensurate with the task, it is important to consider the most effective mechanism. As well as loans linked to individuals, debt can be linked to properties. Property-linked finance (PLF), also known as property assessed clean energy (PACE) loans, would enable homeowners to receive financing to support 100% of the upfront costs for a retrofit project. The liability would be secured against the property and repaid through an additional property tax, typically over extended timescales (eg 15–25 years) that make repayments more affordable.

^h The loan is typically tied to the homeowner, but the loan can be transferred to the new owner in the case of sale. Alternatively, the funds can remain with the seller.

The liability remains with the property if there is a change of ownership, meaning homeowners with limited debt capacity could take advantage of the financing. This also acts to bring down interest rates. Repayments would be collected by local authorities through a new local land levy that is specific to the individual property. The legal amendments required for implementation may require new primary legislation or may fall into ministerial remits.

PLF would help to solve the landlord-tenant split incentive problem, as current rental norms have tenants paying back council tax (an existing non-transactional property tax). It would also overcome the temporal split incentive and issues caused by short payback periods, limited personal savings, and restricted lender appetite. For successful implementation, the operationalisation of the scheme must enshrine consumer protection so that consumers are not required to pay back more than the actual financial savings of the energy efficiency measures. Financial regulation and supplier accreditation are also key.

PACE schemes have been used in the United States to mobilise over 200,000 homeowners to invest \$5bn in energy efficiency and other improvements to their homes. In the UK, the Green Finance Institute (GFI) has called for the introduction of PLF, based on the US PACE model. The GFI report suggests that PLF could unlock up to £70bn of private capital for upgrading UK homes, targeting 2.1m EPC D-rated and below owner-occupied homes.^{i,53} This could well be expanded as other tenures are brought into the fold.

Alongside PACE, the UK is seeing a growth in green mortgages from existing housing stock with a jump from 4 products in 2019 to 61 in 2024.⁵⁴ However, a lack of consumer understanding and demand within the absence of a national policy framework means that very few households can attract additional finance on attractive terms for home retrofitting.

VfM Principle 9: Align monetary and credit policy to the government's clean energy mission.

Credit allocation in the banking sector is fundamentally misaligned with a low-carbon transition. The UK approach has focused on disclosures modelled on the Task Force on Climate-Related Financial Disclosures (TCFD) and has failed to meaningfully shift credit flows. The Office for Budget Responsibility estimates that the private sector must exceed £30bn (2019 prices) of additional green investment over the next three years⁵⁵ – a 10% increase on current private sector levels of investment across the economy.^{j,56}

Even if the green investment gap is closed, the cost of capital (ie the money owed back to the banks and investors who fund projects) is a potential challenge. The CCC's Finance Advisory Group⁵⁷ reported that, in an uncertain policy environment, costs of capital could represent over 30% of overall net zero investment. But the CCC estimates that that effective policy could cut this from £17bn/year in 2050 to £3bn/year.⁵⁸

A targeted credit policy framework that keeps interest rates low for green investments, but allows a higher rate for other economic activities, would help introduce more appropriate price dynamics to close the investment gap and cut the cost of capital.

By enabling a rapid transition away from expensive and volatile fossil fuels, a well-targeted intervention would be counter-inflationary⁵⁹ in the medium to long term. Thus, it would support the Bank in delivering both its primary mandate of price stability and its secondary mandate of supporting government economic policy,⁶⁰ including the net zero transition. It would do so by speeding up our transition away from fossil fuels through reducing the financing costs of renewable energy projects. This means cheaper renewable electricity and less vulnerability to future energy price shocks.

ⁱ GFI estimates £52bn–£70bn. GFI also assumes residential PLF market is based on owner-occupied homes that are classified as 'able to pay' and have an EPC rating of D or below. PLF is assumed to have higher uptake in owner-occupied buildings where the 'churn' of homes in that market is relatively high and such loans can help to overcome homeowner concerns about sunk costs into energy efficiency improvements.

^j Private sector investment in the UK (including private investment in dwellings) averaged about £300bn a year (current prices) over the past five years.

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For retail banks, this could be done by repurposing the Bank of England's existing Term Funding Scheme (TFS) to set up a permanent green TFS. The TFS offers cheap funding – at or close to the Bank rate – to banks, which increases their capacity for lending to households and firms. By repurposing the TFS into a targeted scheme, the Bank could provide zero or negative real interest rates for green activities, while keeping its main policy rate in positive territory.

As an illustrative example, the Treasury and the Department for Business, Energy & Industrial Strategy (BEIS), representing the elected government, could advise the Bank to start by targeting energy efficiency retrofits, clean energy activities, electric vehicles, and charging stations – in line with the government's missions; and lowering borrowing costs for households and small and medium enterprises (SMEs). Once the UK Green Taxonomy is implemented, the green TFS could also be used to target a range of other green-defined activities. For more detail on this see our report on *Green Credit Guidance*.⁶¹

To support lower borrowing costs at an empowered NWF that can issue its own bonds, the Bank of England could make additional purchases of NWF bonds from third-party private investors. The additional demand for NWF bonds would help keep its borrowing costs low, and any profits made by the Bank of England for holding NWF bonds would re-circulate to the Treasury. This is discussed in more detail in the NEF report *Greening Public Finance*.⁶²

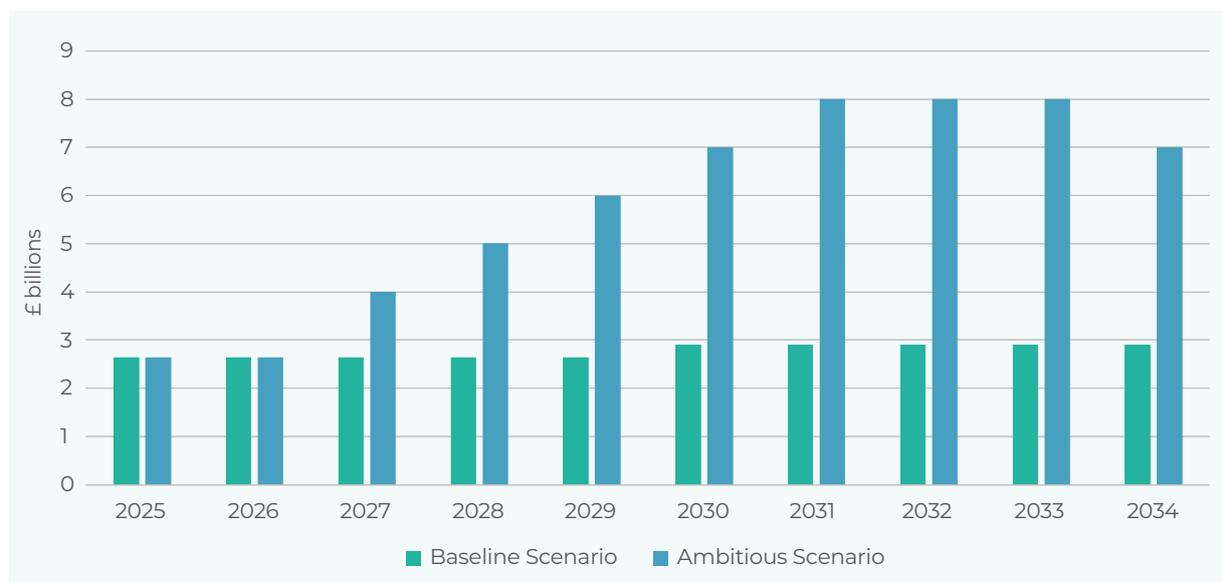
5. A PLAN FOR GOVERNMENT, 2025-34

Decarbonising the UK’s homes is a sizeable challenge. We estimate, based on figures from the Climate Change Committee (CCC), that around £315bn of overall funding is needed.^k A share of

this will need to be publicly funded and the new government has announced a capital allocation plan of £13.2bn over the course of the parliament for energy efficiency support. Assuming a modest 10% rise in spending in the following five years (ie 2029–34), this is equivalent to just under £30bn over ten years.

In this section, we use this as our starting point, examining how best this funding could be spent. We also model a more ambitious scenario, more in line with Labour’s previous £60bn spending pledge. We present an illustrative spending profile over the decade in figure 2 below.

FIGURE 2: MODELLED GOVERNMENT SPENDING ON RETROFIT



Source: NEF’s calculations

FUNDING AND FINANCE

For this research, we modelled three scenarios. The first takes Labour’s commitment of spending £13.2bn over five years (baseline) including a new loan scheme; the second assumes the same public spending but differential interest rates on loans; and the third sees the government allocating £30bn over five years which the Labour Party originally committed to in 2021–22. Interest rates play a factor in all three scenarios as we assume a significant amount of home upgrades are funded by low-interest loans with local authorities and central government borrowing at different interest rates.

The methodology is described in further detail in Appendix 2.

Funding fuel-poor homes

As we argue in our first value for money (VfM) principle, allocating funding to fuel-poor will be critical. Existing policies already do that, and we expect the new Labour government will sustain grant funding schemes such as the Energy Company Obligation (ECO). We envisage the government reforming these schemes in the coming months – as per ongoing consultations. This means rationalising the various fuel poor focused schemes to just four:

^k For more detail, see Appendix 2.

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1. A social-housing-focused scheme, now the Warm Homes: Social Housing Fund. This should be combined with funding for the revised Decent Homes Standard.
2. A scaled-up emergency insulation scheme, similar in ambition to the Great British Insulation Scheme which concludes in March 2026.
3. Local authority funded scheme which will launch in April 2025 as the Warm Homes: Local Grant. This includes funding, within a cost cap per household, for both insulation measures and low carbon heating.
4. A reformed ECO.

The new Warm Homes: Local Grant puts an end to competitive funding rounds for local authorities and offers needs-based funding. This is a welcome approach, but future allocation rounds need to be linked to delivery milestones. This funding should be long term to allow councils to manage both supply and demand and keep inflation down. It should also encourage area-based retrofit, with councils given sufficient flexibility to use grant funding to enable this. Over time, local government capacity and expertise should be built up to support delivery.

In our baseline scenario, our modelling illustrates the following:

- In the first two years, 390,000 fuel-poor households will be upgraded with this number rising to 1.27m by the end of 2030. This includes the installation of low-carbon heating measures such as heat pumps, solar thermal, and electric storage heaters.
- Over the ten-year period, just over half of the UK's approximately 4.4m (2.26m) households in fuel poverty (as of 2022) receive deep retrofit measures. This includes the majority of social housing occupants in fuel poverty and just under two-thirds in the private rented sector.

We assume that fuel-poor owner-occupiers are fully grant funded and private and social landlords with fuel-poor tenants are given a partial grant in line with current schemes (Appendix 2).

We estimate that with £22.7bn of grant expenditure for fuel poor over a decade, the central government could enable £37bn of capital expenditure on building retrofit for the fuel poor, with the additional capital coming from social housing providers and private landlords. We highlight the split across tenures of this funding in table 2 below.

TABLE 2. ILLUSTRATION OF CAPITAL EXPENDITURE THAT IS GRANT FUNDED ACROSS TENURES

		Fuel-poor owner-occupied sector	Fuel-poor private rented sector	Social housing	Total
	Proportion of capital expenditure that is grant funded	100%	50%	41%	
	Total number of homes, thousands	2,070	1,383	957	4,410
2025 to 2034	Capital expenditure, £ millions	£10,716	£14,333	£11,951	£37,000
	Cost to government, £ millions	£10,716	£7,167	£4,900	£22,783
	% complete	30%	60%	86%	51%

Source: NEF calculations. Grants include the existing £7,500 upfront subsidy provided under the Boiler Upgrade Scheme.

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For comparison, we modelled a more ambitious scenario, where the government spends approximately £60bn over ten years (its original commitment from 2022):

- For the first two years, the uptake is similar to the previous scenario with nearly 400,000 fuel-poor households upgraded with this number rising to nearly 2.4mn by the end of 2030.
- Over the ten-year period, all of the UK's nearly 90% of the 4.4m households in fuel poverty (as of 2022) are protected from the direct costs of retrofit.
- We estimate that with £46bn of grant expenditure, the central government could enable £64.0 bn of capital expenditure on building retrofit for the fuel poor.

Both scenarios highlight how fuel poverty targets are considerably difficult without a significant boost in investment. These numbers reflect the high cumulative cost of energy efficiency and low-carbon heating deployed together. However, even in scenarios where only energy efficiency measures are targeted to address fuel poverty, official targets are likely to be missed.¹

Part of the challenge is demonstrated by the high costs of low-carbon heating which are not abating in installed costs, despite nearly 300,000 certified heat pumps in operation currently. The heat and building strategy from 2021 set out an ambition of reducing the cost of heat pumps by 25%–50% by 2025 and reaching cost parity with gas boilers by 2030.⁶³ It is safe to assume that the 2025 ambition is unlikely to be met while the 2030 goal is dependent on the efficacy of policies such as the Clean Heat Market Mechanism, which has already been downgraded on the back of active lobbying by the gas boiler industry.⁶⁴

Non-fuel-poor and zero-interest loans

As emphasised by the CCC, the absence of support for non-fuel-poor households is the biggest policy gap in relation to housing retrofit. This is particularly true in finance and funding.

For the most affluent of these households, we assume that *private* property-linked finance (PLF) unlocks £70bn - in line with the Green Finance Institute's (GFI's) recent estimate.⁶⁵ These households may choose to use savings, as well as property-linked loans to finance this. Research from the International Energy Agency (IEA) indicates that debt is usually used to finance around 70% of green investment costs in the buildings sector.⁶⁶ This implies that private PLF could unlock a total capital expenditure of £102bn.

The government should also introduce, by early 2026, a green credit framework, as explained in VfM Principle 9 to bring down the cost of capital. For retail banks, this could be done by repurposing the Bank of England's existing Term Funding Scheme (TFS). Concurrently, a new government-backed zero-interest loan scheme should be launched. This could be done through either an empowered National Wealth Fund (NWF) or government-backed private lenders.

If the NWF was empowered to act like Germany's KfW (*Kreditanstalt für Wiederaufbau* or Reconstruction Credit Institute), with its debt removed from government borrowing figures (as explained in VfM Principle 7), then it could issue green bonds on capital markets to fund this lending. For context, the KfW issues between €70bn and €90bn each year. Just like the KfW, the NWF could lend to households, through refinancing via commercial banks, for home upgrades.

To make this lending zero interest, the central government could pay off the interest. To make this most cost effective to the government, the targeted credit policy framework should be extended to include the NWF. This could be done through the Bank of England making additional purchases of NWF bonds from third-party private investors.

Some of the key points on our baseline scenario:

- If the government introduces dual interest rates, such that it reduces the cost of capital by 2 percentage points below the UK Investment Bank (UKIB) (now NWF) lending rates, then the government can enable £62bn of investment

¹ This assumes no additional income related schemes are introduced. The government could well meet its target by simply enhancing the eligibility of the warm home discount scheme to reduce the fuel poverty count using the *Low Income Low Energy Efficiency* (LILEE) metric.

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with £3bn of interest spending over ten years (and £15bn over the lifetime of the loans, which our modelling assumes is over 30 years). In this scenario, the cost of capital is equivalent to just 3% of the value of the capex or 5% of the value of the lending.

- We estimate an approximate 8.6m homes receive major upgrades over ten years through this lending scheme.

Figures 3 and 4 below illustrate the scale of capital investment and associated whole-house upgrades over the next decade. This is presented across tenures and through a mix of grants and loans.

FIGURE 3: FORECAST OF WHOLE HOUSE UPGRADES OVER THE DECADE THROUGH A MIX OF GRANTS AND LOANS

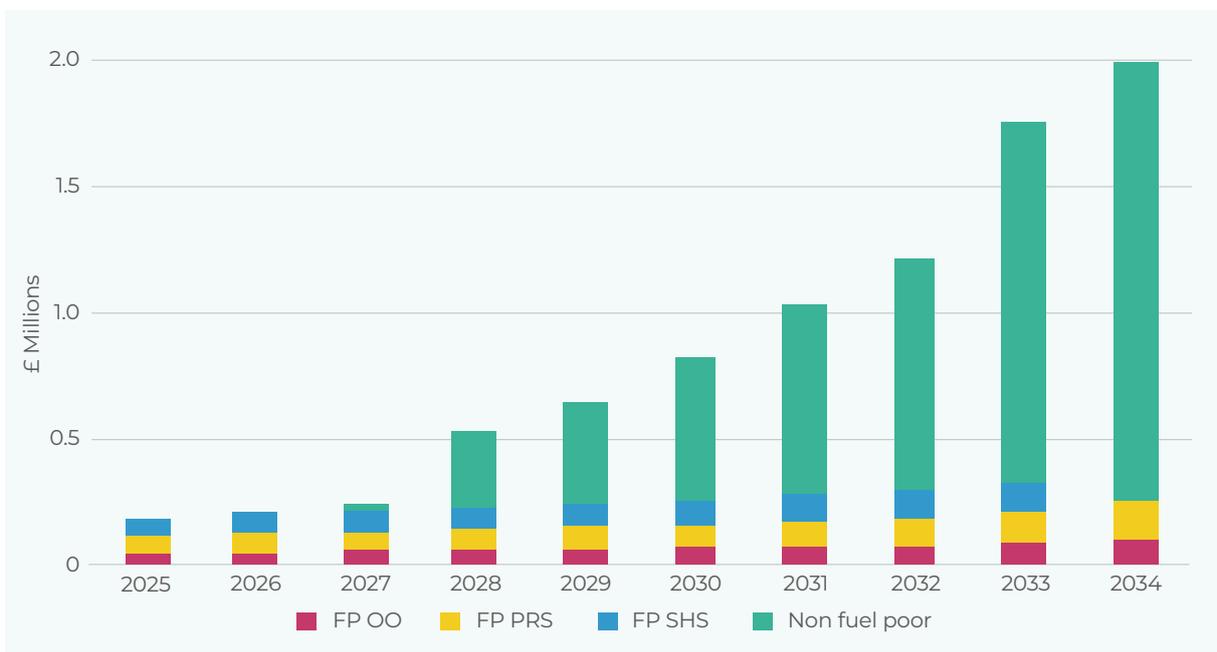
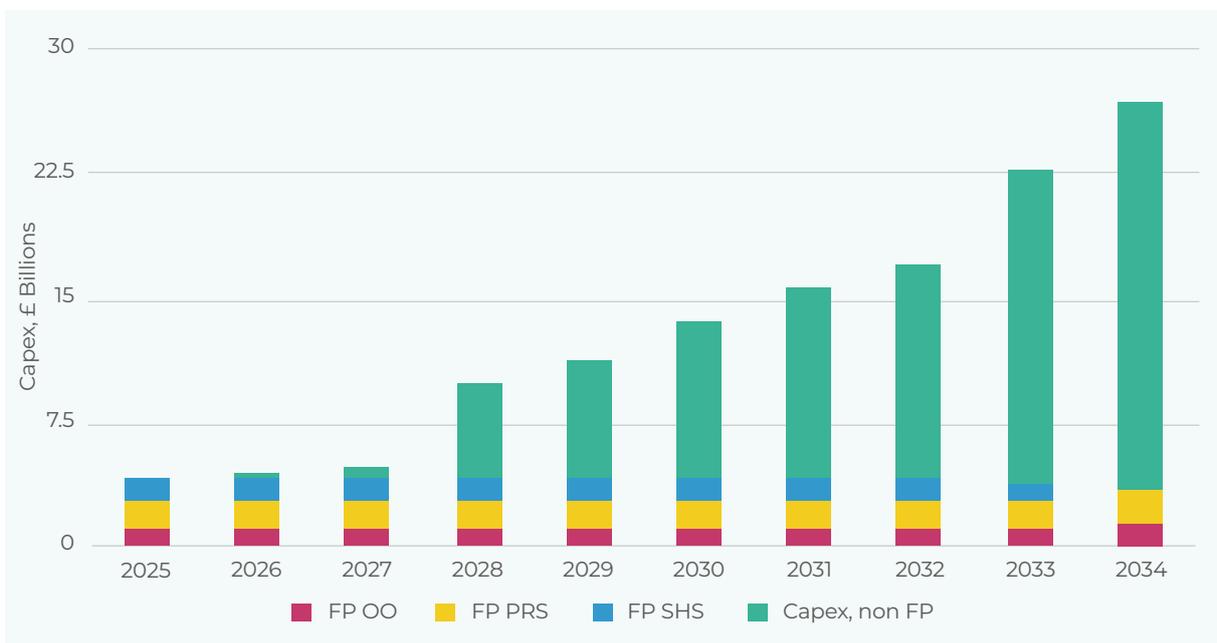


FIGURE 4: FORECAST OF TOTAL CAPITAL EXPENDITURE, THROUGH A MIX OF GRANTS AND LOANS



Source: NEF calculations. FP OO – fuel poor owner occupied, FP PRS – fuel poor private rented sector, FP SHS – fuel poor social housing sector. The assumption here is that these houses receive insulation and low-carbon heating measures.

TABLE 3: ILLUSTRATIVE IMPACT TO 2050 OF THE TEN-YEAR PROGRAMME, £ BN

	Impact to 2050 of the ten-year programme, £ bn			Return on investment	
	Capital expenditure	Direct economic stimulus	Cost to the central government	£ stimulus per £1 of central government spending	£ capex per £1 of central government spending
Without dual rates	£210.8	£256.5	£49.7	£5.16	£4.40
With dual rates	£210.8	£223.1	£32.4	£6.89	£4.60

Source: NEF calculations

The challenge of home retrofitting has highlighted how several factors, beyond finance, are necessary to be put in place for effective delivery. These include, among other things, training and upskilling programmes, building standards, minimum energy efficiency standards and their enforcement, supply chain development, and energy market reform. These enabling factors will be discussed in greater detail in a future paper.

RETURN ON INVESTMENT

For each £1 of central government money spent an average of £4.60 of capital expenditure will be directly stimulated. Without a dual rates system that reduces rates 2 percentage points below the NWF current rates, then for each £1 of investment, £4.24 of capital expenditure will be directly supported.

Accounting for economic activity supported more widely, including the cost of capital, for every £1 invested £6.90 of economic activity is supported in the absence of a targeted credit framework and £5.16 per £1 with it. This is an underestimate as it does not cover all borrowing, or indirect or induced multipliers.

The cost to the central government of our proposed approach is £32.4bn over 30 years, and £49.7bn in the absence of dual rates. Table 3 presents the illustrative impact to 2050 of the decade long programme in terms of direct economic stimulus and return on investment.

TRAINING COSTS OF RETROFIT

Investment in training and skilling the workforce for the transition is already underway but is happening in a piecemeal and diffused manner. Table A2 in Appendix 1 highlights a few different schemes that the previous government introduced to fund training in retrofitting. Bucking the overall trend on private sector investment in skills, the construction industry is one of only two sectors (financial services being the other) that saw a net increase of investment per worker between 2011 and 2022, from just over £2400 to around £2850.

However, much more investment is needed to meet the full-time equivalent (FTE) requirements of the retrofit challenge over the coming decade. Figure 5 offers an illustrative investment profile of spending on training. These costs are relatively small, and the more pressing challenge is to get the necessary institutional capacity to deliver the training at scale.

FIGURE 5. ILLUSTRATIVE INVESTMENT PROFILE ON SKILLS OVER THE NEXT DECADE



Note: This illustrative spending profile builds on the Construction Industry Training Board (CITB) report titled Building Skills for Net Zero, which shows the FTE requirement for each specialist skillset, projected to 2050. We extracted existing costs of training courses across different skill sets, such as heat pump installer, retrofit coordination and risk management, BPEC Solar PV installation course, etc., from current training providers. We then cross-referenced these costs with unit costs of training under different government schemes highlighted, assuming a modest 2% annual inflation in costs. The spending profile highlights total spending and does not split the cost into public or private investment. The investment dip in 2028 is an artefact of the number of trainees as projected by the CITB with a steep rise in early investment to meet the ambitious targets for home retrofitting in the coming years.

6. A NEW GOVERNANCE FRAMEWORK FOR A NATIONAL HOME UPGRADE PROGRAMME

Experience with home upgrade schemes has shown how a piecemeal approach to policymaking, with a patchwork of funding and delivery mechanisms, operating within unreasonably short timelines, has led to a very poor uptake of insulation and low-carbon heating measures. A national home upgrade programme, supported by a robust governance framework and long-term funding is essential, if we are to meet our carbon budgets.⁶⁷

I. GOVERNANCE

A national homes upgrade unit (NHU) unit should be established to provide strategic coordination across national and local government efforts to upgrade housing stock. The NHU's responsibilities would encompass the following areas:

1. Strategic Coordination: The NHU's primary role would be to provide strategic coordination across national and local government efforts to upgrade the housing stock. This would involve working with local government, guiding them in establishing and implementing their own home retrofitting strategies, including the introduction of the so-called one-stop shops.
2. Funding and support: The NHU would be responsible for overseeing the funding that the government provides to local authorities for upgrade measures. This would include financial

support for energy efficiency measures, such as insulation and low-carbon heating, and funding to support local businesses and supply chains.

3. Technical guidance: The NHU would provide technical guidance to local authorities, helping them assess the housing stock in their areas, develop appropriate action plans, and implement the most effective measures to roll out retrofitting measures at scale.
4. Monitoring and evaluation: The NHU would play a role in monitoring the effectiveness of local retrofitting strategies. This would involve assessing data from local government and ensuring that these measures are having the desired impact on energy demand and bill reduction.
5. Policy development: While policy decisions are ultimately made by elected officials, the NHU, with its technical expertise, would contribute to the improvement of retrofitting policies and regulations by providing data, analysis, and recommendations.

II. GUIDANCE AND PRINCIPLES

A national home upgrades programme would set and advocate for a standardised approach to home renovations, most likely through the concept of one-stop shops, promoting innovation where possible and encouraging collaboration with industry experts. Technical standards for retrofitting already exist (eg PAS 2035) and are quite comprehensive. However, depending on the capacity of local authorities and the nature of their housing stock, different classes of one-stop shops could be implemented.⁶⁸

This is illustrated in Figure 6. The national government would provide the necessary support to local authorities after it has received satisfactory applications from councils willing to deploy the one-stop shop at any of the prescribed levels. A council could begin with the facilitation model of retrofitting and then escalate over a few years to undertake a full-fledged Energy Service Company (ESCO) mode of retrofit delivery.

FIGURE 6: TYPES OF ONE-STOP-SHOP BUSINESS MODELS FOR DOMESTIC RETROFIT



Source: Reproduced from Pardalis et al.⁶⁹

III. MONITORING AND EVALUATION

A retrofitting strategy would require continuous tracking of improvements in energy usage, sustainability, and occupant health, ensuring the initiatives meet environmental and health goals. The consensus among the retrofitting sector is the creation of building passports which allow existing and new homeowners of a certain property, alongside other relevant stakeholders, to understand the interventions made to the property alongside the scope for further measures in the future, with the ultimate goal of creating a net zero building.⁷⁰ Such an approach would also future proof the system by allowing additional information, such as the materials and components that have been used in different areas of a building, helping us understand how it was constructed, and how it should be maintained and adapted or deconstructed in the future.⁷¹

IV. STAKEHOLDER ENGAGEMENT

A local-area-based retrofitting strategy would require councils to engage deeply with construction firms, energy suppliers, distribution network operators, local GP surgeries, community groups, and other charities, ensuring broad-based support and input in the retrofitting programme.

Political leadership in Westminster is critical to ensure statutory duties or responsibilities imposed on local authorities are matched by long-term finance, a dedicated public engagement campaign, cross-departmental coordination to better manage trade-offs, and effective feedback mechanisms between local and national authorities. In other words, a mission-oriented approach that aligns the government, business, and civil society towards achieving shared goals.

Considering the poor financial reality of many local authorities and a highly dispersed and reduced technical capacity to deliver such a large programme, our proposed blueprint will necessarily take time to bear fruit. However, accelerating existing schemes, investing in training and upskilling, and reforming regulations, planning, and the retail end of the energy market will all be critical enabling factors alongside the local delivery framework.

CONCLUSION

The Warm Homes Plan provides a transformative opportunity to decarbonise the UK's housing stock, reduce fuel poverty, and drive economic renewal. As described in this report; by embedding a stable, needs-based funding model and empowering local authorities to lead area-based retrofitting, the plan can potentially address long-standing barriers to effective delivery. This approach ensures more efficient use of public funds, accelerate the pace of retrofitting, and creates thousands of green jobs, particularly in regions most in need of economic support.

Central to this strategy is the alignment of public and private finance, with mechanisms such as low-interest loans and term funding schemes providing affordable capital for households and local authorities. These financial tools will unlock significant private investment, amplifying the impact of public funding.

Through coordinated national leadership and localised delivery, the plan addresses the dual imperatives of economic justice and climate action. By cutting residential carbon emissions, reducing household energy bills, and fostering green job growth, the Warm Homes Plan positions the UK as a global leader in the just transition to net zero. With clear targets, sustained investment, and local empowerment, this plan offers a path to a fairer, greener, and more resilient future for all.

APPENDIX 1: FUEL POVERTY DEFINITIONS

Fuel-poor households are those that are unable to afford adequate heating, cooling, and other essential energy services without compromising other basic needs. There are various ways of defining this and some measures are highly susceptible to changes in energy costs. Previously, all UK nations used the same definition. However, concerns have been raised in recent years that the definition was not fit for purpose. The UK and Scottish governments commissioned independent reviews of the definition, which was subsequently revised in England and Scotland.

National Energy Action estimates that 6m households are fuel poor (as of 1 April 2024) across the UK. They define fuel poverty as when a household spends 10% of its income on keeping its home at a satisfactory heating level.

Using the official definition of fuel poverty of each of the four nations we estimate that there are 4.4m households in fuel poverty.

TABLE A1. NEEDS TITLE

Tenure	Number of households (thousands) - Fuel poor
Owner occupied	2,071
Private rented	1,383
Social housing	957
All households	4,411

ENGLAND

The UK government’s definition of fuel poverty in England uses the Low Income Low Energy Efficiency (LILEE) indicator. Under this indicator, a household is considered to be fuel poor if they are living in a property with a fuel poverty energy

efficiency rating (EER) band D or below, and when they spend the required amount to heat their home, they are left with a residual income below the official poverty line.

According to these estimates, there are 3.3m households in fuel poverty in England (as of 2022 in the February 2024 data release).

SCOTLAND

In Scotland, a fuel-poor household is one where:⁷²

- more than 10% (20% for extreme fuel poverty) of net income is required to pay for their reasonable fuel needs after housing costs have been deducted; and
- the remaining household income is not enough to maintain an acceptable standard of living, defined as at least 90% of the UK Minimum Income Standard (MIS) once childcare costs and disability or care benefits are deducted.

According to the Scottish House Condition Survey in 2022, 791,000 households (31% of all households) were estimated to be in fuel poverty.

WALES AND NORTHERN IRELAND

In Wales and Northern Ireland, fuel poor is defined as households “having to spend more than 10 per cent of income (including housing benefit) on all household fuel used to maintain a satisfactory heating regime”.^{73,74}

We estimate using Census data on the number of households and the prevalence of fuel poverty by tenure⁷⁵ that there are an estimated 198,000 households in fuel poverty in Wales.

In Northern Ireland, an estimated 22% of households are in fuel poverty. We estimate using Census data that this equates to 165,000 households.

SKILLS PROVISION

Table A2 highlights a few different schemes that the previous government introduced to fund training in retrofitting.

TABLE A2: KEY EXISTING AND PREVIOUS SCHEMES FOR SKILLS PROVISION

Policy	Summary	Budget & timeline
Green Home Grants Skills Training	The training was rolled out to support the Green Homes Grant (GHG) scheme. The training focused on renewable energy, retrofit coordination and fabric measures. Eighteen projects across the country were successful in receiving funding with 8,959 learners starting a funded course and 77% of them completing the course.	The budget was £6.9m, but only £6.4m was used between November/December 2020 and March 2021.
Home Decarbonisation Skills Training Competition Phase 1 (2022-23)	The scheme funded training for people interested in building retrofit, low-carbon heating, and energy efficiency work.	The available funding was £9.2m from November/December 2022 until March 2023.
Home Decarbonisation Skills Training Competition Phase 2 (2023-24)	The objective of the scheme is to continue supporting training in energy efficiency and retrofit.	The available funding is £8.85m for 2023-24.
Heat Training Grant: Heat Pumps	The scheme aims to provide support to trainees so they can take short heat pump or heat network training courses.	Not given, but "training providers will be able to offer trainees grants of up to £500. Spring 2023 - March 2025. It may be extended in the future.
Heat Training Grant: Heat Network Competition	The aim of the scheme is to address the current skills gap in the heat network supply chain by providing training courses on operation, building, design, and maintenance of heat networks.	Same as above. It has two bidding rounds to deliver training in 2023-24 and 2024-25.

APPENDIX 2: METHODOLOGICAL NOTES

ESTIMATING THE AVERAGE COST PER HOME

To estimate the cost of retrofitting the UK's leaky homes we use a combination of sources. To estimate the cost of upgrading the building fabric per home, we use English Housing Survey (2022–23) estimates of the average cost of upgrading a home to energy performance certificate (EPC) C, by tenure.⁷⁶ All costs are updated by inflation using gross domestic product (GDP) deflator projections where these exist and Bank of England target inflation where they do not.

We also include the average cost of low-carbon heat within our cost estimates. For 2025, this is based on data from the HUG 2 (July 2023 - Feb 2024 data) and updated by inflation. For purposes of simplification, we apply the average government contribution to heat pump installation, as provided, in HUG2 across all tenures. These figures are not too dissimilar to the average installation costs of air source heat pumps as part of the Boiler Upgrade Scheme (BUS) over the past four quarters. By 2033, we assume that the cost of a heat pump is in line with the cost of a conventional boiler (£3k + inflation), and between 2025 and 2033 we assume that the cost of heat pumps falls linearly. From 2033 onwards, we assume all costs rise with inflation (assumed to be 2%).

FUEL POVERTY FUNDING MODELLING ASSUMPTIONS

We model the costs of retrofitting fuel-poor homes. As explained in the report, we recognise that it is not appropriate or desirable for all households to take on debt to fund retrofit work and it is preferable for the government to (partially) grant fund this work. We have varied the extent of grant subsidy by tenure, using the following assumptions:

- We assume that fuel-poor owner occupiers are fully grant funded and private and social landlords with fuel-poor tenants are given a partial grant in line with current schemes.
- We assume private landlords with fuel-poor tenants receive grants equivalent to 50% of the value of the home energy upgrade. This is analogous to the £5k fuel poverty funding grants available for landlords undertaking £10,000 of work through the Midlands NZ Hub⁷⁷ and the newly announced Warm Homes:Local Grant.
- For fuel-poor social homes, we assume the central government grant funds 41% of the investment cost with the remainder funded through debt from other budgetary funds. The 41% represents the ratio of grant funding to match funding of wave 2.1 of the Social Housing Decarbonisation Fund (SHDF).

NON-FUEL-POOR MODELLING ASSUMPTIONS

We model a zero-interest loan scheme for the non-fuel poor. The model estimates the annual interest costs of the lending and assumes that all interest is paid each year by the central government. This is what is summed up and presented as the cost to the government. It's important to clarify that the cost of the lending extended each year is estimated over the entire duration of the loan – not just the ten years that is the focus of the report.

In undertaking this modelling, we make several categories of assumptions:

1. Interest rates

- In our baseline scenario, we assume that the annual interest rate charged on lending for the years 2024–25 to 2028–29 is 5%. For 2029–30 to 2033–34, this is assumed to fall to 4%.
- The 5% rate is broadly in line with the current rate charged by the UK Investment Bank (UKIB) when lending to local authorities. This is based on UK Gilts plus a 0.5 percentage point management fee.

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- In our low interest rate scenario, we assume a reduction of 2 pp in interest rates, realised through a term funding scheme. We also assume the government picks up the interest costs, effectively taking the risks of defaults, albeit minimised by the intervention from the Bank of England.
- The interest rate is assumed to be fixed for the duration of the loan. This means that some of the longer-term costs of the lending will be overstated if rates fall. This is not expected to have a significant impact in the ten-year period that is the focus of the report.

2. Capital expenditure mobilised

We recognise that not all work in the non-fuel-poor sector will need to be debt funded. Debt unlocks a greater value of capital expenditure than the value of lending alone. Research from the IEA⁷⁸ indicates that debt is usually used to finance around 70% of green investment costs in the buildings sector. We use this assumption when estimating the total capital expenditure in each scenario.

3. Loan payback

- In our debt modelling, we assume that the value of the annual payment made by households is equivalent to 3.6% of the principal at the start of the loan.

This is in the right ballpark in terms of expected annual household savings for an average household to improve to EPC Band C, roughly £360.

4. Lending

- We model a steep rise in the value of lending over the decade, starting from £200m in 2026, rising to £6.5bn in 2030 and £16bn in 2034. These are large sums but commensurate with the scale of loans provided by the KfW in Germany.

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info@neweconomics.org
+44 (0)20 7820 6300 @NEF
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WRITTEN BY:

Chaitanya Kumar, Christian Jaccarini,
and Paulo Yunda

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