Institute for Public Policy Research

PUMP UP THE VOLUME

A COMPREHENSIVE PLAN TO DECARBONISE THE UK'S HOMES

Josh Emden and
Lesley Rankin

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SUMMARY

Unlike the UK's success in promoting renewable energy generation in the power sector, the decarbonisation of the UK's housing stock has repeatedly stalled. The UK is currently installing only 6 per cent of the heat pumps, 9 per cent of the cavity wall insulations, 3 per cent of the loft insulations and 2 per cent of the solid wall insulations needed by 2028 to keep pace with net zero. This is despite the opportunity to create 138,000 new jobs[1] by 2030, prevent 10,000 excess winter deaths through warmer homes, and save households – particularly fuel poor homes – hundreds of pounds on their energy bills. In light of recent gas price increases, moving to low-carbon heating such as heat pumps that use increasingly renewable electricity will also protect homes from the volatility of international gas markets.

Ramping up deployment to meet net zero targets and realise these benefits presents many challenges. Most households cannot afford the upfront costs of energy efficiency upgrades and low-carbon heating; the idea of an able-to-pay market is overstated. This risks pricing out fuel-poor homes from bill savings, from which they stand to benefit the most. Businesses have been scarred by their experience of the Green Homes Grant and a substantial scale up in properly trained installers is still required. Most of all, many households do not feel they have enough information about low-carbon heating, nor fully understand the impact that gas boilers have on climate change. YouGov polling commissioned by IPPR shows that 58 per cent of people[2] have either never heard of a heat pump or have heard of it but know nothing about it. Despite this, the British public are supportive of grants (62 per cent)[3] and loans with subsidies (61 per cent) for insulation and heat pumps.[4] However, as Citizens Advice have recently highlighted, many current schemes are too complicated and difficult to navigate for many people.

UK policies do not sufficiently address these challenges and lack a joined-up approach. Most energy efficiency and low-carbon heating schemes are underfunded, with the Energy Efficiency Industry Group estimating a funding gap of just under £12 billion (£7 billion for energy efficiency and £4.76 for heat pumps) between 2020–25. Although there have been some relatively successful schemes, such as England's Local Authority Delivery scheme and energy advice services in Scotland and Wales, there have also been high-profile failures, including the Green Homes Grant voucher scheme, which has had a 'chilling effect' on industry confidence.

While UK policy is faltering, policies in other European countries are having a more positive impact. France, Germany and Italy's ambitious policies to support households – a mix of grants, tax credits and loans with repayment subsidies – have led them to become the three largest heat pump markets in Europe in 2020. In contrast, over the same year, the UK installed just over a quarter of the number of heat pumps in Germany, a sixth of the number in Italy, and a 10th of the number in France.

Well-designed, comprehensive policy to realise the opportunities of home decarbonisation and meet net zero targets for the UK has never been more

1 This is a net figure after accounting for changes in employment across the economy.

2 All figures, unless otherwise stated, are from YouGov Plc. Total sample size was 1,683 adults. Fieldwork was undertaken between 29-30 September 2021. The survey was carried out online. The figures have been weighted and are representative of all GB adults (aged 18+).

3 Specifically, the question asked about support for: 'A grant of £7,500 for insulation and heat pumps if any additional costs such as new radiators were similar to, or less than, that of a gas boiler'.

4 specifically, the question asked about support for: 'A zero-interest loan for insulation and heat pumps with the government helping to pay up to 50 per cent of the loan. Any additional costs such as new radiators would again be similar to, or less than, a gas boiler'.

important. In this report we identify five core components that would constitute such a scheme. Each element must be well sequenced to avoid unintended consequences. They must also be treated as a package of measures; these are not individual policies to adopt in isolation.

STANDARDS

- To set a clear direction, we recommend **introducing point of rent, point of renovation and point of sale regulations requiring an EPC rating of C by 2028 for renters and by 2030 for homeowners**.
- To bring supply chains together and thereby minimise disruption for households, we recommend **introducing a 'whole-house heat' standard requiring all homes to have energy efficiency upgrades and low-carbon heating installed together** (unless additional insulation measures are not needed). This standard would be introduced as a voluntary industry standard for installation in 2023.
- Similar to targets for phasing out petrol and diesel cars, we recommend **phasing out the sale of oil boilers by 2028 and gas boilers by 2033 at the very latest**. This recommendation was supported by a plurality of polling respondents (38 per cent) with 35 per cent opposing and 27 per cent unsure.

SKILLS

- To ensure energy efficiency upgrades and low-carbon heating systems are compatible with each other when installed, we recommend **expanding existing training standards to require an understanding of the whole heating system**.
- To increase the attractiveness of the industry to new labour market entrants and reassure workers looking to retrain, we recommend that the government work with unions and workers to **co-develop and introduce high-quality job standards for the retrofit industry**.
- To ensure skilled installers are available to meet the scale up in demand required, we recommend the government should provide **£160 million in training funding per year to 2028 through a Green Training Fund** for both existing workers and new labour market entrants.
- To coordinate this funding and help installers find accredited training providers, we recommend that the government **reintroduce skills academies**.
- To ensure high-quality installations and public trust, we recommend **banning 'pay to pass' training and expanding the resources of TrustMark and MCS (Microgeneration Certification Scheme) to clamp down on bad certification practices**.

CASH

- To immediately incentivise switching to electrified low-carbon heating and distribute costs of climate policies more fairly, we recommend that the government **move the policy costs levied on energy bills into general taxation**. This would reduce energy bills for 70 per cent of homes and increase costs as a proportion of household income for the wealthiest homes by 0.35 per cent per year.
- We recommend **introducing a 'one stop shop' for financial support known as 'GreenGO'**. Key features of the scheme would include:
  - **Full grants for fuel poor homes** that would fund energy efficiency upgrades, additional measures such water tanks and new radiators and low-carbon heating. This recommendation was supported by 66 per cent of respondents in our YouGov poll. We estimate the average cost of these grants would be approximately £12,000 per household, potentially falling to £9,500 by 2030.
  - **Grants for non-fuel poor homes of up to £7,500 per home until 2025**. We estimate that any remaining costs would be comparable to the price of a high-end gas boiler. The recommendation for grants of up to £7,500,

including this information about additional costs, was supported by 62 per cent of respondents in our YouGov poll.

- Beyond 2025, drawing inspiration from Germany, we recommend that the government consult on **introducing zero-interest loans of up to £7,000 with repayment subsidies of up to 50 per cent of costs proportionate to the increase in energy efficiency achieved**. This recommendation, including the information about additional costs, was supported by 61 per cent of respondents in our YouGov poll. After 2030, this would reduce to £6,500 and repayment subsidies of up to 30 per cent of costs to reflect falling heat pump prices. If consultations and engagement with consumer groups gave negative feedback, then the government should be prepared to continue with grant funding.

- Private finance could also have an important role to play by offering **green mortgages, demand-aggregated financing and community municipal bonds**. The extent to which private finance will be involved will depend on market confidence in government which will require leading the way with public funding. Consequently, we caution that the government should not wait for private financing solutions to develop in the absence of public financing.
- To further incentivise switching from gas to electrified low-carbon heating, the government should **consult on introducing a carbon tax on gas by 2030**. These consultations should take place immediately and be announced as soon as possible to give people time to prepare. This recommendation, with the caveat that it would only be introduced when the costs of low-carbon alternatives are the same or cheaper than gas boilers, was supported by 41 per cent of respondents, opposed by 32 per cent with 27 per cent unsure.

COMMUNICATION

- To raise consumer awareness, understanding and enthusiasm for the GreenGO scheme, the government should **run a massive national information campaign** with consistent branding throughout. Key elements of this campaign should include:
  - **National advertising** on television, online, through local councils and common services such as GPs, post offices, banks and supermarkets.
  - **A cross-referral mechanism** whereby services can refer households to energy advice services, benefits support or both.
  - **A properly resourced energy advice service (online and over the phone) in England and increased capacity for services in Scotland and Wales** in anticipation of greater demand. These advice services would provide energy savings advice and help households to access funding. This recommendation, combined with the national advertising campaign, was supported by 65 per cent of respondents in our YouGov poll.[5]
  - **A requirement for installers to provide bespoke 'building renovation plans'** to give households clear information about how to upgrade their home and how to access funding.

CAPACITY

- To ensure all local authorities have the capacity to apply for funding for area-based schemes, we recommend that the government **increase capacity in the local energy hubs that are currently supporting local authorities**.
- To coordinate institutions (such as local energy hubs, skills academies and energy advice services) and communicate future scheme changes, **we recommend that the government and devolved administrations should each create national retrofit agencies**.

5 Specifically, the polling question asked about support for: 'A national information campaign about what insulation and low-carbon heating households may need in future that includes a free over-the-phone energy advice service'.

1. INTRODUCTION

The benefits of a retrofit programme to upgrade the UK's housing are substantial, yet the decarbonisation of the UK's housing stock has repeatedly stalled. A step change in policy design and delivery is needed if the UK is to have any chance of decarbonising its homes in time to meet net zero targets and deliver on the opportunity of job creation, healthier homes, and lower bills.

SCOPE OF THIS REPORT

In this report, we examine the barriers to delivering a UK retrofit programme that will keep pace with net zero targets and propose a comprehensive scheme to address them, and that will deliver on the opportunity of job creation, healthier homes and lower bills. Our report focuses on retrofitting rather than new-build properties, and predominantly on the 21 million homes that need to be upgraded with better insulation and heat pumps, though many recommendations will also be relevant to other heating technologies (Foster et al 2020). This report also focuses on homeowners and private landlords and is intended to complement IPPR's *All hands to the pump*, which looks at retrofitting for the social housing sector (Webb et al 2020).

While we acknowledge hydrogen boilers may be suited to some specific regional contexts, we do not consider their widespread uptake in this report for several reasons. First, manufacturing 'blue hydrogen' from industrial processes that 'crack' methane will require carbon capture and storage (CCS) that has not yet been deployed at scale. Second, even with CCS, methane can still leak during transportation (though perhaps less than in US examples that have been studied) (Baxter 2021). Third, scaling up blue hydrogen will increase gas imports, making the UK more exposed to international gas prices (CCC 2018). And finally, manufacturing 'green hydrogen' through electrolysis to heat a substantial number of UK homes would require annual deployment of renewable generation to increase to unrealistically high rates (Webb et al 2020; CCC 2019).

THE SCALE OF THE CHALLENGE

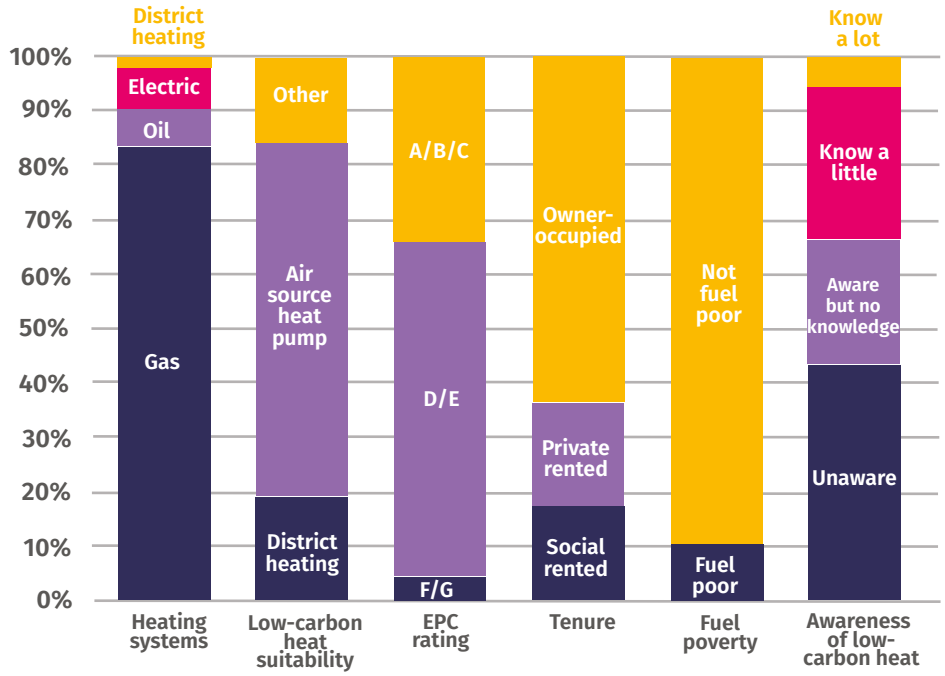
The benefits of a retrofit programme to upgrade the UK's housing are substantial. A comprehensive, long-term plan could support up to 138,000 new jobs in both energy efficiency and low-carbon heating installation by 2030 (Dicks and Dellaccio 2021). Warmer homes could prevent 10,000 excess winter deaths, saving the NHS between £1.4 and £2 billion annually (EEIG 2021a). And more energy-efficient homes could save households hundreds of pounds on energy bills (Wolf et al 2021) and protect them from energy bill increases related to wholesale gas price rises dependent on international markets (Gosden et al 2021).

However, unlike the UK's success in promoting renewable energy generation in the power sector, the decarbonisation of the UK's housing stock has repeatedly stalled. The UK is still dominated by gas heating, an inefficient housing stock and low awareness of low-carbon heating despite the millions of homes where it will be needed (figure 1.1).

FIGURE 1.1

The UK's housing stock is inefficient, largely fuelled by gas and households have little awareness of alternatives

Profile of UK housing stock across several metrics



Source: CCC 2020a

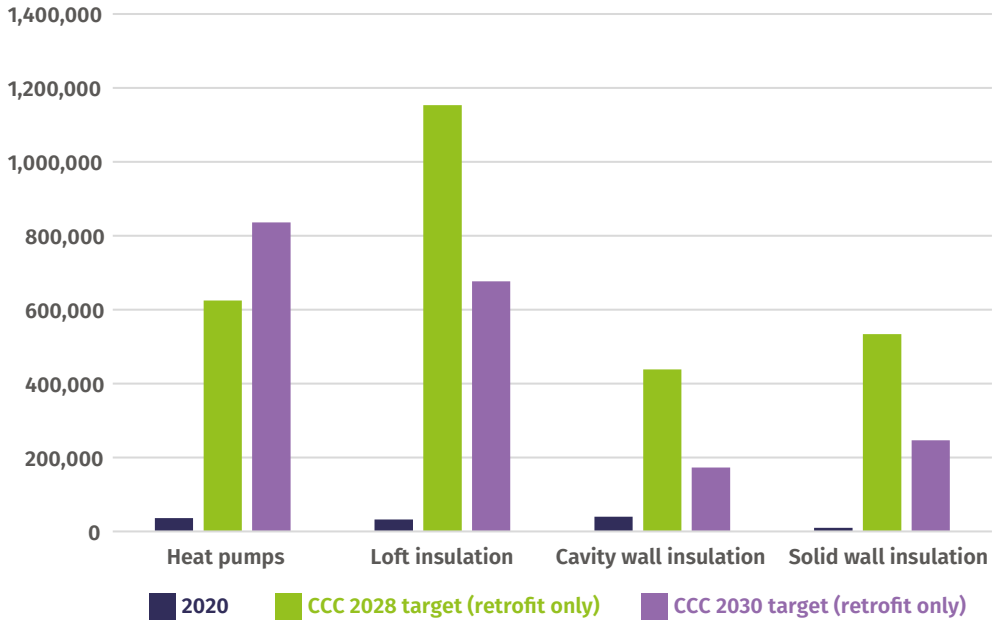
As a result of Covid-19 lockdowns, increased home working has led to a rise in residential building emissions of 7 per cent – and they are not expected to return to the levels seen prior to lockdown restrictions (CCC 2021).

There is a large shortfall between the number of energy efficiency measures and heat pumps being installed now, and the rate of installation that will be needed by 2028 and 2030 (figure 1.2). The UK is currently only installing 6 per cent of the heat pumps, 9 per cent of the cavity wall insulations, 3 per cent of the loft insulations and 2 per cent of the solid wall insulations needed by 2028 to keep pace with net zero.

FIGURE 1.2

The current annual rate of installation of heat pumps and energy efficiency measures will need to increase substantially to keep pace with net zero targets

Annual installations in 2020 by technology compared to required annual installations in 2028 and 2030



Source: IPPR adaptation of CCC 2021; CCC 2020b

When factoring in new homes, the annual target for heat pumps increases to 900,000 by 2028 and 1.1 million by 2030, significantly higher than the government's 600,000 target by 2028 (CCC 2021; EAC 2020). Though the scale up to 2028 deployment figures will not happen overnight, the increases needed year on year, particularly in the first few years, are steep. Heat pump sales will need to quadruple, loft and wall insulation sales double, and cavity wall insulation sales will need to increase by 77 per cent.

In short, a step change in policy design and delivery is clearly needed if the UK is to have any chance of decarbonising its homes in time to meet net zero targets.

2. BARRIERS

Financial barriers, industry challenges, and consumer confidence are among the barriers to meeting net zero targets and realising the benefits of retrofitting our homes.

FINANCING BARRIERS

Without financial support for decarbonising the UK's homes, there is a serious risk of increasing inequality – where lower bills and warmer homes are only accessible to the small proportion of households that can afford it – while bills increase for the majority, including the fuel poor who would benefit the most. As one of our focus group participants put it: 'I'd love to be more eco-friendly but it's [the] money'.

Upfront costs

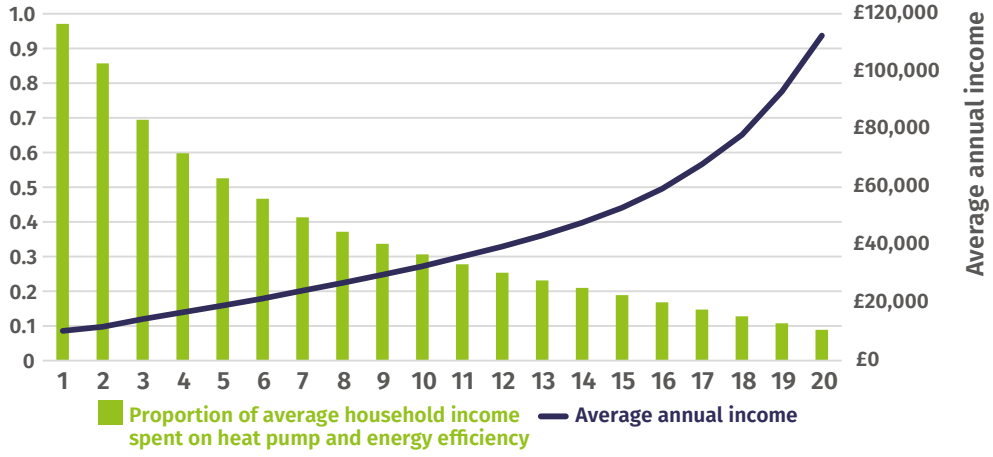
The upfront costs of energy efficiency upgrades and heat pump installations – estimated at an average of just under £10,000 per home (CCC 2020b) – are unaffordable for many households (figure 2.1). For most people, their savings will not cover this cost. In 2020, the average person in the UK had just £6,757 saved. One-third of people in the UK have less than £600 in savings and almost one in 10 (9 per cent) have no savings at all (Boyle 2021). In short, the notion of an 'able-to-pay' market is overstated.

Finally, while just under two-thirds of homes will pay no more than £1,000 for energy efficiency upgrades, 5 per cent of homes will require more extensive upgrades, with costs exceeding £10,000 (Foster et al 2020). These are also disproportionately more likely to be fuel poor households (CFP 2020).

FIGURE 2.1

The cost of a heat pump and energy efficiency retrofits is unaffordable for many households, particularly those on lower incomes

Cost of a heat pump and energy efficiency retrofits as a proportion of household income by quantile



Source: EJC 2021

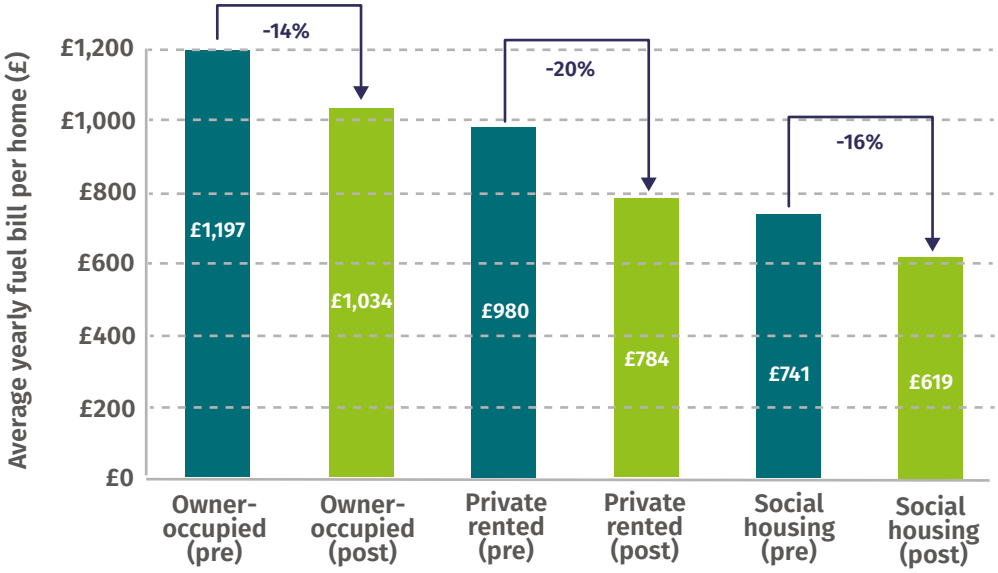
Running costs

Upfront costs also risk locking many homes out of potential bill savings. Energy efficiency upgrades combined with heat pumps could lead to an average 16 per cent reduction in energy bills compared with current heating systems, rising to as much as 20 per cent (just over £200) in the private rented sector (figure 2.2). This lock out would be most damaging to fuel poor homes who stand to gain the most. Energy efficiency could make a substantial contribution to reducing the fuel poverty gap – the reduction in spending on bills needed to take a household out of fuel poverty – which stood at £334 per year on average in 2018 and close to £1,000 per year for some private tenant fuel poor homes (CFP 2020).

FIGURE 2.2

Energy efficiency upgrades combined with low-carbon heating could lead to lower energy bills, particularly for private renters

Average yearly fuel bills for homes before and after energy efficiency and low-carbon heating installation, by tenure type[6]



Source: Foster et al 2020

Supply of private finance

Private sector stakeholders such as lenders and network operators could have an important role to play in financing the decarbonisation of the UK's building stock. Several mortgage lenders are already offering 'green mortgages' which offer lower interest rates for energy efficiency retrofits, but these mortgages make up a fraction of the overall mortgage industry in the UK (GFI 2021a). From a network operator perspective, there has been limited policy to monetise potential revenue streams which households could access in return for providing networks with grid balancing services (Sandys and Pownall 2020)[7].

6 This does not include savings from more energy efficient appliances which the CCC estimates at around £1.2 billion per year by 2050, or approximately £40 per household.

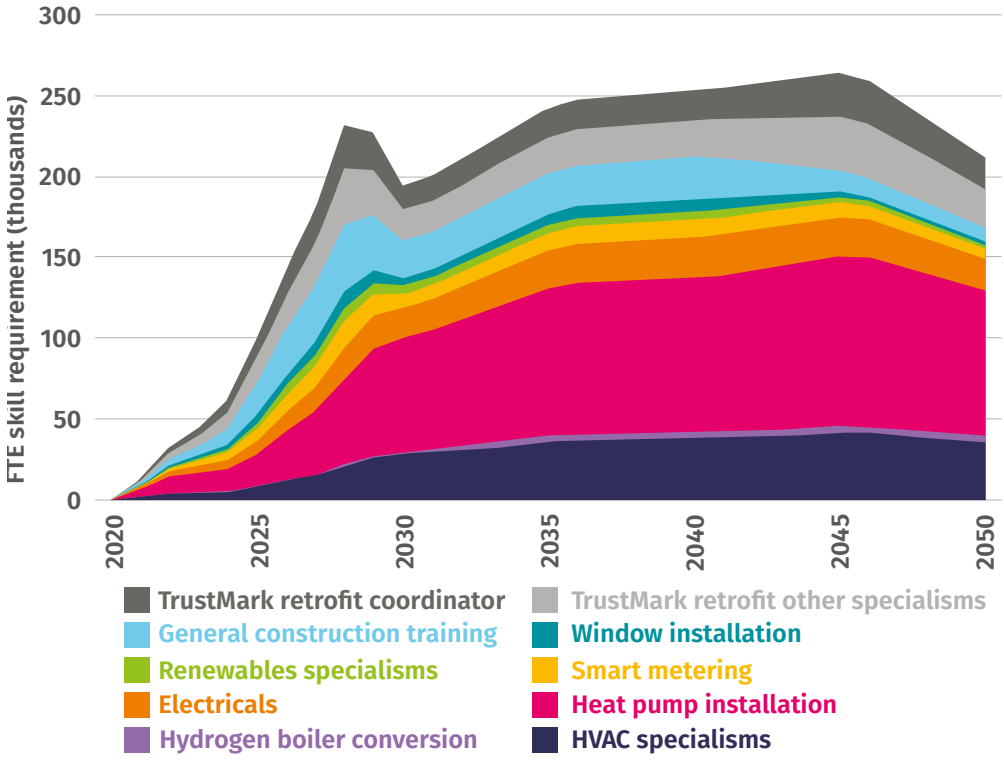
7 For example, agreeing to switch heat pumps on and off at certain times of the day in order to balance supply and demand.

INDUSTRY CHALLENGES

A substantial increase in high-quality installation is essential to keep pace with net zero targets and build public trust. Recent analysis suggests that over 200,000 direct jobs will be needed by 2030, over and above the natural turnover rate in the industry (figure 2.3). However, limited demand drivers and challenges with the supply of skills risk holding back manufacturers and installers.

FIGURE 2.3

A substantial increase in installers will be needed to keep pace with net zero targets
Additional full-time employment (FTE) requirements for each qualification level and specialist skill



Source: CCC 2020b

Demand-side challenges

Many manufacturers and installers depend on government policy to provide them with the confidence to invest in their supply chains and workforce, but such long-term policy has not been forthcoming. The Green Homes Grant was cancelled within months of its introduction but, even if it had gone ahead, many stakeholders we interviewed and surveyed noted the timeframes for delivery were far too sudden, with one commenting: 'the government was asking us to scale up from delivering around £700 million of work to £2 billion of work in one year'. Manufacturers we interviewed said that building UK production facilities for heat pumps and the materials for energy efficiency upgrades could take up to five years. Finally, for those businesses that did participate in the scheme, many lost money when the scheme was scrapped, spending an average of £87,000 to scale up their workforce (EEIG 2021b). One stakeholder we spoke to described this experience as having a 'chilling effect on market confidence'.

Supply-side challenges

Even if a clear direction were set by government, industry stakeholders we interviewed and surveyed cited several challenges in training up enough installers to meet future demand. These included:

- **Attractiveness of the industry**: Retraining existing installers will not be sufficient to meet the future demand for workers, but attracting new graduates and workers from other industries can be challenging as the sector can be perceived as less appealing. This is particularly true for women and minority ethnic groups who are significantly under-represented in the industry (EJC 2021; CITB 2021).
- **Time, cost and accessibility of training**: Covering wages when employees undertake training can be a significant time and resource cost to businesses (CITB 2021). This is particularly challenging for the high number of contractors and micro-businesses in the sector who would need to forgo earnings to take time to train. Furthermore, while some training can be undertaken online, relatively few training providers and colleges offer in-person training – and these courses are often spread out across the country making them difficult to access (BEIS 2021a).
- **Appropriateness of training standards**: Stakeholders we interviewed suggested that PAS2035[8] standards for energy efficiency retrofitting, and MCS (Microgeneration Certification Scheme) certification for heat pumps, are suitable in isolation from each other. However, these standards do not offer a combined approach that looks at the overall heating system of a home. As one stakeholder we interviewed noted, 'a good quality installation is 10 per cent about the heat pump and 90 per cent about understanding the heating system in the home'. Stakeholders also pointed to the importance of giving the heating engineer more responsibility for and control over managing upgrades, rather than dividing the responsibility between energy assessors, designers and installers (TrustMark 2020). From a customer perspective, installing energy efficiency measures and heat pumps together can maximise a heat pump's efficiency[9] and hence potential bill savings. Additionally, having to source different installers for energy efficiency measures and heat pumps adds a layer of complexity to retrofitting and increases the risk of incompatible installations, resulting in a negative customer experience.
- **Ensuring job quality**: While the job creation potential of decarbonising the UK's homes is substantial, these new green jobs are not guaranteed to be good jobs. The construction and retrofit industries are particularly fragmented with minimal formal training available, or indeed required, and a high number of contractors and micro-businesses that lack secure long-term employment (Killip et al 2021). Moving into this industry without greater professionalisation and higher job standards will be particularly challenging for many workers in the gas industry who can currently expect decent job standards and higher levels of unionisation.
- **Addressing bad practices**: Some industry stakeholders we spoke to reported instances where installers have been able to 'game the system' by taking training with minimal testing. Similarly, stakeholders noted that some certification bodies will certify that installations in homes meet required standards without checking the property itself. These practices can have a negative effect on a household's experience and undermine trust in the installers, the technology, and overall government policy. As one stakeholder pointed out, 'the problem with heat pumps is not the heat pump itself, but the quality of the installation'.

8 The name of the current standards for any installers conducting retrofit works in a household.

9 More energy efficient buildings reduce heat loss which means heating is needed less often. In addition, the smaller the difference between current temperature and desired temperature, the more efficient the heat pump is at transferring heat. Therefore, slower heat loss also improves the efficiency of heat pumps.

IMPLEMENTATION BARRIERS

Even with funding and an installer base in place, successful delivery requires securing public trust, awareness, understanding and enthusiasm, and scaling up institutional capacity to implement any policy programme.

Lack of awareness and understanding

Due to the disruption and personal nature of home retrofitting, clear communication and accessible information will be crucial to building trust and ensuring successful delivery. Despite polling showing that nearly two-thirds (62 per cent) of homeowners in England were interested in participating in the Green Homes Grant (EEIG 2021b), Citizens Advice has recently noted that many households found this scheme and others too complicated to navigate (McGrath 2021). In one of our focus groups, none of the participants had heard of any energy efficiency or low-carbon heating schemes.

Importantly, awareness of policies is also not the same as trust in, or knowledge of, heat decarbonisation. In our focus groups, many households did not feel they knew enough about low-carbon heating, and were nervous about the disruption it might cause. This is supported by YouGov polling commissioned by IPPR which shows that 58 per cent of people[10] have either never heard of a heat pump or have heard of it but know nothing about it. Indeed, previous polling has shown just under half of households (47 per cent) do not know that their boiler contributes to climate change (ESC 2019). Finally, many households, particularly fuel poor homes, tend to be less engaged in the energy market and can find it difficult to access information about, or apply for, government schemes (Emden and Lloyd 2017).

Public trust

Examples of bad practice and poor-quality installation are also a major risk to trust. For example, up to 10 per cent of energy efficiency measures under the Energy Company Obligation were poorly installed (Bonfield 2016) and there have been recent examples of energy efficiency installers delivering poor-quality installations or taking advantage of households by claiming to be part of government schemes (Citizens Advice 2021). This was also a clear area of concern for our focus groups, with one participant noting: 'I just worry this is all going to be pushed out [and] the people that are going to install these things probably won't have the knowledge [about] how to do it adequately and professionally'.

Tenure type

Demand drivers for retrofit differ greatly by housing tenure. Homeowners may wish to upgrade properties to reduce their own bills or increase the value of their property. However, incentives for landlords are more limited as they do not benefit from energy savings (GFI 2020). From a tenant perspective, many are concerned about increasing rent to cover retrofit costs and the threat of eviction while works are being undertaken (Generation Rent 2021). Depending on the technology being installed, even owners of flats in leasehold properties may require consent from the freeholder of the land. Securing the necessary consent could also prove complex in areas where there are mixed estates of private and social housing (Bright et al 2019). Indeed, among our homeowner focus group, those in flats expressed a greater lack of knowledge around responsibility and the permissions needed for works than those in houses.

Local capacity

Local authorities will play a key part in delivering any government scheme since they often have a better understanding of their housing stock and can therefore prioritise the poorest households for bill-saving retrofits (Emden et al 2018). However, between 2010 and 2018, many councils had their budgets cut in real

10 From a sample size of 1,683.

terms by nearly 50 per cent (NAO 2018). This has severely limited their ability to identify households most in need, produce clear procurement guidelines and tenders, oversee programmes, and make applications for funding. In addition, councils lacking the capacity to deliver a scheme may be more likely to outsource responsibility for the management of delivery. If not done effectively, this could result in less transparent quality control.

Challenges with measurement

Many stakeholders have pointed out that the EPC (energy performance certificate) methodology itself is flawed as it neither accurately reflects real-use performance of heating systems and insulation, nor bases calculations on emissions reductions that could be achieved (Elmhurst Energy 2021). An accurate understanding of technology performance will be crucial, both for the customer experience and for lenders who will need confidence in the technology to expand their range of lending products.

3. EVALUATION OF UK POLICY

Despite a wide variety of policies to support the installation of energy efficiency measures and low-carbon heating across England, Scotland, Wales and the UK as a whole, policymaking is not sufficiently joined up and does not do enough to overcome the barriers set out above.

ELECTRICITY PRICING CURRENTLY WORKS AGAINST HEAT DECARBONISATION

Many policies supporting renewable energy generation are currently levied on energy bills, particularly on electricity bills where levies account for 23 per cent of the bill compared to less than 2 per cent of gas bills (Ofgem 2021). These costs both disproportionately penalise fuel poor households and act as a disincentive for many homes to switch to low-carbon heating (Barrett et al 2018).

FUNDING IS INSUFFICIENT

Analysis by the Energy Efficiency Infrastructure Group suggests there is a cumulative public funding gap of around £7 billion for energy efficiency retrofitting and between £4.76 billion to £4.36 billion[11] for heat pump installation (EEIG 2021a) from 2020 to 2025.

Breaking this figure down by key policy areas, the Energy Company Obligation (ECO) has hitherto been poorly targeted at fuel poor homes and underfunded (Emden et al 2018). Recent proposals to increase ECO funding for 2022–26 from around £700 million per year to £1.1 billion per year and to focus on whole-house approaches that deliver multiple measures for fuel poor homes are welcome but still fall short of what is needed.

The Green Homes Grant was prematurely ended in March this year. However, the Home Upgrade Grants (HUGs) and Local Authority Delivery scheme (LADs) – both components of the Green Homes Grant – have been welcomed by many industry stakeholders. In the case of HUGs, substantial support could be available for fuel poor off-grid homes (up to £25,000), recognising that these homes will require more substantial retrofits to lift them out of fuel poverty.

The upcoming replacement for the Green Homes Grant, the Clean Homes Grant, could offer up to £7,000 for the cost of a heat pump for fuel poor homes. However, in its current form, it is not available to non-fuel poor homes, nor does it cover the cost of energy efficiency, upgrades and additional measures such as hot water tanks, new radiators and replacing gas appliances. These additional measures could represent between 30 and 50 per cent of the total costs depending on the technologies installed[12] (Foster et al 2020) which, as figure 3.1 shows, would still be unaffordable for many low- and middle-income homes.

Finally, for private rented homes, the minimum energy efficiency standard for landlords has a range of different exemption criteria, including a cost cap that limits the extent of energy efficiency improvements that can be made (BEIS 2019).

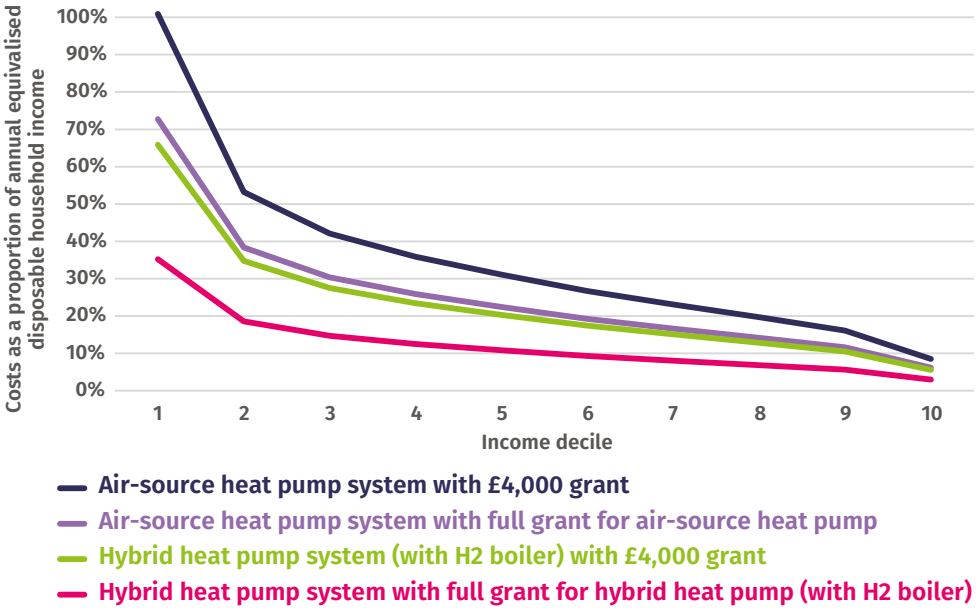
11 The £4.36 billion figure takes analysis by the EEIG and updates this with recent government consideration to increase the Clean Homes Grant funding from £100 million to £400 million.

12 Based on costs for air-source heat pumps and hybrid air-source heat pumps (such as those combined with hydrogen boilers). For ground-source heat pumps, the costs would be higher still, ranging from £11,700 to £17,347, depending on the size of the unit and whether it is combined with other types of heating.

FIGURE 3.1

Across a range of grant scenarios for heat pumps, the additional required investment into energy efficiency upgrades and other measures like radiators, hot water tanks and replacing cooking appliances remains a sizeable financial barrier to many households

Investment required for additional measures after subtracting grant support for heat pumps, as a proportion of the annual equivalised disposable household income, by income decile



Source: Leeds SRI, Foster et al 2020; ONS 2020 [adapted by IPPR]

THE DELIVERY OF POLICIES HAS BEEN MIXED

The example of the Green Homes Grant shows that good principles need to be backed up by good policy design. From our interviews and surveys of manufacturers and installers, stakeholders frequently cited how administrative hurdles and over-burdensome verification made the scheme extremely difficult to navigate. This is supported by recent findings from the National Audit Office that suggest the design of the scheme was rushed, overly complex, had high administrative costs and expected industry to scale up far too quickly than many said they could (NAO 2021).

By contrast, the Local Authority Delivery scheme has been largely welcomed. This is in part because funding is distributed to five local energy hubs across England that have a better understanding than national government of the housing stock across each region and can work with local councils, support them to access funding and identify which homes need upgrades the most.

In Wales, stakeholders found that the combination of the area-based scheme Arbed and the advice service Nest were generally successful in reaching out to fuel poor homes and providing them with the right support. Similarly in Scotland, despite a complex range of policy initiatives, the Home Energy Scotland advice service has been instrumental in supporting households with personalised advice and helping them to find the schemes best suited to their needs.

SUPPORT FOR SCALING UP SKILLS IS LIMITED

Funding for skills in the retrofit industry has been relatively minimal and does not replace previous cuts to the Adult Education Budget (EJC 2021). Indeed, the funding for the lifetime skills guarantee does not even include skills training for retrofitting (Christie-Miller and Luke 2021). The skills training competitions introduced in tandem with the Green Homes Grant have limited funding and are only available from a relatively small number of third-party providers and colleges (BEIS 2021a).

THE LACK OF A JOINED-UP APPROACH CAN BE CONFUSING FOR HOUSEHOLDS

With more effective implementation, the principle behind the Green Homes Grant to provide funding for both heating and energy efficiency could have helped to streamline supply chains and, ultimately, simplify the offering for households. However, as table 3.1 shows, there is now a lack of a joined-up approach to policymaking. For example, for a home in England on the gas grid – representing approximately 20.5 million homes – applying to have both energy efficiency measures and heat pumps installed will require navigating multiple schemes and will likely mean dealing with a range of different companies.

TABLE 3.1

Many households will need to navigate multiple schemes to access support for both energy efficiency upgrades and heat pumps

Funding schemes based on the technologies they support

Technologies	ECO4 (consultation)	Clean Homes Grant	Home Upgrade Grant	Local Authority Delivery scheme*
Heat pumps off-gas grid	Yes (but only if the result is lower bills)	Yes (but only off-gas grid)	Yes	Yes
Heat pumps on-gas grid	Yes (but only for properties that do not have gas central heating)	No	No	Yes
Energy efficiency measures off-gas grid	Yes	Minimum insulation requirements but no funding to install them	Yes	Yes
Energy efficiency measures on-gas grid	Yes	Minimum insulation requirements but no funding to install them	No	Yes

Source: BEIS 2021b; BEIS 2021c; BEIS 2021d

***In the Local Authority Delivery scheme example, the same eligibility restrictions apply as with an individual seeking funding, but the local authority would source funding on the individual's behalf.**

DIFFICULTY TARGETING HOMES

Previous IPPR research has highlighted that the Energy Company Obligation (ECO) scheme has struggled to identify where fuel poor households actually live. According to stakeholders we spoke to in Wales, this has also been a challenge for their area-based scheme, Arbed. This is because decisions taken by local authorities to reach out to fuel poor homes are based on the EPC ratings of properties. However, approximately half of all homes in Wales do not have an EPC. Similarly, the recent Green Homes Grant used receipt of benefits as a proxy for offering the maximum £10,000 grant. However, as organisations like National Energy Action have previously pointed out, there is a need to develop new proxies to ensure better targeting (NEA 2021).

TABLE 3.2

Summary of energy efficiency and low-carbon heating policy in the UK, England, Scotland and Wales

	Policy	Region	Description	Financing	Year launched
Low-carbon heating and energy efficiency (retrofitting)	**Energy Company Obligation (ECO)**	Separate programmes for England, Scotland and Wales but core funding from Westminster	A scheme offering energy efficiency upgrades through energy suppliers. It has changed multiple times since inception and now focuses on fuel poor homes, with ECO 4 focusing on whole-house retrofits and allowing energy suppliers to work with local authorities for up to 50 per cent of their obligations.	Approximately £700 million per year (reduced from over £1.1 billion in 2013), with an average of £1 billion per year being considered for ECO 4 which will run from 2022–26.	April 2013
	Renewable Heat Incentive	UK	A feed-in tariff for the use of low-carbon heating technologies such as heat pumps and solar thermal panels.	Estimated committed spend in 2021/22 of £132 million.	Launched in April 2014, recently extended to 2022
	Green Homes Grant	UK	£5,000–10,000 grants for energy efficiency and low-carbon heating improvements.	£2 billion for one year, of which only £300 million is expected to be paid out.	August 2020, scrapped after three months
	Local Authority Delivery scheme	England	Local authority led scheme focusing on support for low-income households with an EPC rating of D or lower.	Approximately £500 million committed, £74 million allocated in phase 1A, £126 million in phase 1B, £300 million committed to local energy hubs in phase 2. An additional £200 million has been committed as part of a Sustainable Warmth Competition for phase 3.	August 2020
	Social Housing Decarbonisation Fund Demonstrator	England	A demonstrator project to learn lessons from innovative retrofitting in the social housing sector, using whole-house approaches to bring EPC ratings up to band C or higher.	£62 million awarded, a further £60 million committed for the fund (not demonstrator) from 2021–22 as part of a £3.8 billion manifesto commitment.	October 2020
	Home Upgrades Grant	England	Up to £25,000 in grants for low-income off-gas properties to install multiple measures to the whole house to improve the energy efficiency of these homes.	£150 million committed, £2.35 billion still needs to be confirmed.	February 2021
	Clean Homes Grant	England, Scotland and Wales	A grant of £4,000 towards the cost of low-carbon heating with a focus on low-income households off the gas grid. The government is considering increasing this grant to £7,000.	£100 million being considered for two years, which could potentially be increased to £400 million.	Upcoming
	Minimum energy efficiency standard for the private rented sector	UK	A requirement that no landlord with an EPC rating below E can rent a property as of 1 April 2020, unless they have a valid exemption. The government is currently consulting on increasing this standard to an EPC rating of C by 2025 for new tenancies and 2028 for all tenancies.	Cost cap of £3,500 (including VAT) on energy efficiency improvements. The government is considering increasing the cost cap to £10,000 under new regulations.	October 2017 New standards upcoming
	Gas boiler ban	UK	A ban on the sale of new gas boilers, suggested by the Committee on Climate Change to come into force in 2033. There are suggestions the government is currently thinking of delaying this date until 2035.	n/a	Upcoming
	Decent Homes Standard review	England and Northern Ireland	A standard of housing which must be met by all social housing.	A review is taking place from spring 2021 to summer 2022 to update the Decent Homes Standard.	Upcoming
Skills	**Green Homes Grant skills training competition**	UK	Funding for the delivery of training into low-carbon heating and energy efficiency installation.	£6.4 million awarded to 18 training providers.	September 2020 to April 2021
	National skills fund	UK	A lifetime skills guarantee offering free access to level 3 qualifications. Skills bootcamps that offer free training for up to 16 weeks.	£95 million of £375 million committed for 2021/22 (as part of a larger £2.5 billion pot). £43 million expansion (as part of a larger £2.5 billion pot).	November 2020
General support for energy bills	**Cold weather payment**	UK	A payment of £25 per day for each 7-day period of cold weather.	An estimated £100 million paid from November 2020 to March 2021.	1988
	Winter fuel payment	UK	A payment of between £100 to £300 to households with at least one person born before 26 September 1955, regardless of economic status.	Approximately £2 billion in 2019/20.	1997
	Warm home discount	UK	A one-off discount of £140 made by energy suppliers on electricity bills between October and March.	£348 million paid in 2019/20, £475 million committed in 2022.	April 2011
Scotland	**Home Energy Scotland advice service**	Scotland	Operated by the Energy Saving Trust, this service provides free over-the-phone advice about how to reduce energy bills, create more energy efficient homes and access funding for upgrades.	The service reaches over 90,000 households.	2008
	Home Energy Efficiency Programme for Scotland (HEEPS)	Scotland	HEEPs is a cluster of programmes that include the following: **Area-based schemes (ABS)**: Funding for local authorities to develop and deliver energy efficiency programmes (mainly for solid wall insulation) targeting areas with high levels of fuel poverty. The funding is blended with ECO. **Home Energy Scotland loan scheme**: An interest-free loan of up to £32,500 for owner-occupiers and private landlords (£15,000 for energy efficiency and £17,500 for home renewable systems or connections to district heating). **Warmer Homes Scotland**: Funding for heating options (including low-carbon heating technologies) and insulation measures for fuel poor tenants and owner-occupiers. **Equity Loan pilot scheme:** Equity loan scheme in five local authority areas for small landlords and home-owners on low incomes to help them make repairs (45 per cent of the funding must go towards energy efficiency improvements or reducing heat loss).	HEEPS – ABS: £64 million allocated for 2021/22 with £482 million spend since 2013. HEEPS – Warmer Homes Scotland: the budget for 2019/20 was £24 million. HEEPS – Home Energy Scotland: the budget for 2019/20 was £30 million. HEEPS – Equity Loan pilot scheme: loans of up to £40,000.	ABS: 2013 Warmer Homes Scotland: September 2015 Home Energy Scotland: May 2017 Equity Loan pilot: January 2017 (extended in June 2018)
	Scottish minimum energy efficiency standards		**Private rented sector**: Minimum energy efficiency standards for the private rented sector are due to be introduced requiring landlords to upgrade all rented properties to an EPC rating of D by 2025. **Social rented sector**: Similar standards already apply to the social rented sector and the Scottish government are considering increasing the minimum standards to an EPC rating of B by 2032 for the social rented sector. Recent announcements by the Scottish government will also consider bringing in standards of an EPC rating of C for point of sale, point of rental and point of refurbishment for the majority of homes by 2030 and all homes by 2033.	For the private rented sector, there is an overall cost cap of £10,000, after which private landlords can claim exemptions.	Upcoming (consulted in 2019)
	Low Carbon Heat Skills grant	Scotland	Grants covering up to 50 per cent of training courses for SMEs in air-source and ground-source heat pump installation.	Funded by Scottish government and managed by the Energy Saving Trust.	2021
Wales	**Welsh Government Warm Homes**	Wales	The Welsh Government Warm Homes programme comprises the following schemes: **Arbed**: An area-based energy efficiency programme led by local authorities targeting areas that are likely to have the highest levels of severe fuel poverty. **Nest**: Free service that offers advice to help households reduce their energy bills and can also offer financial support for upgrades for low-income and fuel poor homes.	Arbed: £18.1 million from Welsh government and European investment combined for 2019/20. Nest: £20.6 million funded by Welsh government for 2019/20.	2009
	Welsh minimum energy efficiency standards for social housing	Wales	The Welsh government recently accepted recommendations to increase the EPC rating of social rented homes to A by 2030.	n/a	2021

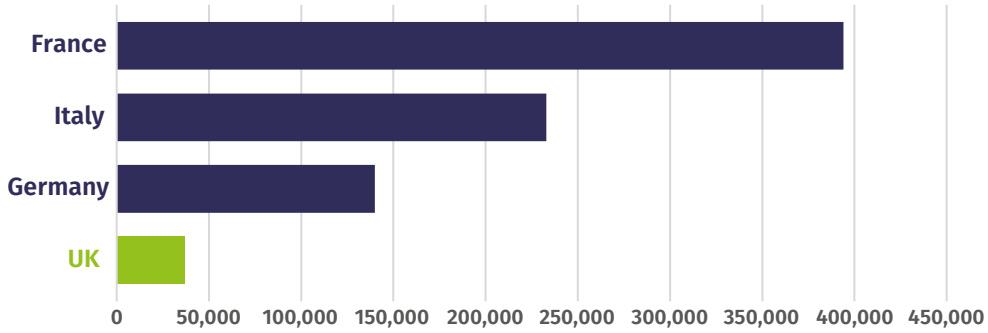
Sources: Arbed am byth 2020; BEIS 2020a; BEIS 2020b; BEIS 2021b; BEIS 2021c; BEIS 2021d; BEIS 2021e; BEIS 2021f; DfE 2020; DfE and DWP 2021; DWP 2020; DWP 2021; EAS 2021; EHA 2021; Fisher and Rudgard 2021; HES 2021; MHCLG 2021; Nest 2021; Ofgem 2020; SCN 2021; Scottish Government 2019; Scottish Government 2021; Swinford 2021; Thomas 2021; Wilmore 2021

4. INTERNATIONAL CASE STUDIES

The UK could learn lessons from other European countries' policies to scale up in energy efficiency and low-carbon heating, particularly the three largest heat pump markets in Europe in 2020: Germany, France and Italy (figure 4.1). Learning from these countries will be vital for the UK – not only to meet its own net zero targets, but also to avoid losing the opportunity to develop domestic supply chains to countries with more attractive markets.

FIGURE 4.1

Heat pump sales are faltering in the UK while increasing in France, Italy and Germany
Heat pump sales by country in 2020



Sources: EHPA 2021, Dawson 2021 [adapted by IPPR]

BEG – GERMANY

Country emissions and targets

With a population of 83 million, Germany's economy is the fourth biggest globally. Greenhouse gas emissions in Germany have fallen by 35 per cent from 1990 to 2019 (Umwelt Bundesamt 2021) and Germany aims to become net zero by 2045 (Appunn et al 2021).

Policy overview

Bundesförderung für effiziente Gebäude (BEG), or 'Federal funding for efficient buildings', updated on 1 July 2021, is the latest iteration of long-standing support for retrofits including heat pumps in Germany. The scheme is funded through the Kreditanstalt für Wiederaufbau (KfW), the German state-owned investment and development bank, and includes brokering low-interest loans, giving performance-related grants, requiring expert advice and installation to ensure appropriate work is carried out to a high standard, and adopting a 'whole house approach' to energy saving (Ekins 2011).

Policy detail

Fixed 10-year renovation loans start at 0.57 per cent interest, with the first year interest free (KfW 2021a). Up to €150,000 is available for a whole-house renovation that meets the 'efficiency house' standard (a technical standard that indicates efficiency compared to a reference building), and up to €60,000 for individual measures (ibid).

Repayment subsidies range from 15–50 per cent. Both the total amount available to borrow, and the repayment subsidy offered, increase with improved energy efficiency of the renovated property (KfW 2021a). An additional 5 per cent subsidy is available for homeowners who commission an individual refurbishment schedule from an energy efficiency expert (ibid). Key features of the BEG scheme are the strong regulatory framework, the high level of financial incentive and the clarity of the message (Schröder et al 2011). Gas boilers are permitted only if they are 'renewable ready' (that is, they can be modified to be a hybrid system with renewable energies, which becomes operational within two years of installation), or if the 'efficiency house' energy efficiency standard is reached as part of the renovation (KfW 2021b). Gas hybrid heating systems that combine condensing technology with renewable energies are also permitted (ibid).

Comparison to the UK

The KfW bank has offered energy efficiency lending programmes since the 1970s, and explicitly in support of climate policy since the 1990s (Schröder et al 2011). The BEG scheme also works with a higher percentage of rented properties than the UK: levels of private renting in Germany, at 55 per cent of housing, are over twice as high as the UK's (RentalCal 2016; Barton and Cromarty 2021). Whereas in the UK, public debate over affordability to the public purse continues, in Germany the public has long been aware of the need for, and are supportive of, energy saving and green initiatives (Schröder et al 2011). This support has remained strong throughout the pandemic, and almost 27 per cent of households state that they already use at least one of the country's requested energy transition technologies (photovoltaics, solar thermal energy, battery storage, heat pumps, combined heat and power, wood pellet heating and electric cars), an increase of 4 percentage points since 2020 (KfW 2021c).

Effectiveness

Heat consumption in residential buildings decreased by 20 per cent from 2000 to 2012 (BEIS 2018). The 'KfW efficiency house' standard is a market-wide standard for energy efficiency in buildings, and there is a well-established scheme structure and distribution network (Rehabilite 2018). At a maximum of 50 per cent grant, bill savings are essential for low-income households to repay the loan, and indeed, a recent KfW review notes that participation of low income households is relatively low and needs to increase (KfW 2021c). On the other hand, despite recent enthusiasm for heat pumps, the historic inclusion of gas in the scheme has meant that, to meet the country's climate targets, emission reductions from buildings need to double over the next 10 years (BEIS 2018).

MAPRIMERÉNOV' – FRANCE

Country emissions and targets

The seventh largest economic power and with a population of 57 million, France aims to reduce energy consumption in the building sector by 28 per cent by 2030 and achieve carbon neutrality for its building stock by 2050 (Climate Transparency 2020). The building sector accounted for 21 per cent of carbon emissions in 2019, and exceeded its 2015–18 carbon budget (ibid). France's 2020 National Low Carbon Strategy plans for 500,000 thermal renovations annually between 2015–30 and 700,000 between 2030–50 (ibid).

Policy overview

Launched on 1 January 2020, MaPrimeRénov' ('My renovation bonus') offers partial grants for home retrofit including heat pumps to all income groups, replacing earlier schemes including a tax credit for energy transition (ISCED), and aid from the National Agency for Housing (Anah) (République Française 2021a).

Policy detail

Whereas previous schemes offered grants to low- and medium-income owner occupiers only, grants are now available to all, and means tested by net household taxable income (République Française 2021a). Grants of up to 40 per cent of the upfront cost are typical, with lower income families entitled to up to 90 per cent of the costs covered (ibid). MaPrimeRénov' can also be combined with a zero-interest eco loan (Éco-prêt à taux zéro [éco-PTZ]) (République Française 2021b).

An energy audit of the home is required before work starts (République Française 2021a), and companies carrying out the work must be RGE accredited (Reconnues Garantes de l'Environnement, 'recognised as guarantors for the environment'), which involves training and commitment to a quality charter (Faire 2018). Due to a shortage of RGE accredited contractors, however, a two-year experiment currently permits work from non-RGE contractors (Toustou 2021).

Rent control measures were added in July 2021, 'aimed at controlling the increase in rent to compensate for the completion of work' financed by the scheme (République Française 2021c; Ambrosino 2021), and landlords must rent out their retrofitted property for a minimum of five years after payment (République Française 2021c).

Effectiveness

France's ecological transition ministry has described MaPrimeRénov' as a 'resounding success', with 380,000 funding applications in 2021 to mid-July (Bauer-Babef 2021). However, some commentators have cited administrative issues delaying consumer applications and resulting in cash flow issues for suppliers (Chesnais 2020). Additionally, gas boilers and log stoves are still covered by the scheme and the 'fabric first' principle is not respected. For example, the energy efficiency improvement of 55 per cent required for the grant can be achieved without full insulation (Ambrosino 2021). The effect on the quality of work of the relaxing of contractor accreditation is uncertain.

SUPERBONUS 110% – ITALY

Country emissions and targets

With the world's 13th largest economy, Italy recently announced plans to cut emissions by 60 per cent by 2030 (Bruno 2021). Building emissions in Italy account for approximately 19 per cent of overall emissions (Climate Transparency 2019).

Policy overview

The Superbonus 110% is a 110 per cent subsidy to help to fund energy efficiency, other green measures including low-carbon heating, earthquake protection, and home modifications for people with disabilities and/or over the age of 65 (Agenzia Entrate 2021). It is available to homeowners, social housing organisations and voluntary and amateur sports organisations (ibid).

Policy detail

The incentive consists of a 110 per cent deduction that is applied to home upgrade costs incurred from 1 July 2020 to 30 June 2022 (Italian Government 2021). The homeowner can pay upfront and receive the rebate in five annual instalments, or transfer the tax credit to a third-party credit institution for immediate access to

funds (ibid). Alternatively, homeowners can choose to pay less upfront and pass on the 110 per cent bonus to the contractor who receives the bonus (ibid).

There are two categories of works; at least one 'driving' measure (including house insulation and a new heating system) is required before 'towed' measures (photovoltaic systems, electric vehicle charging stations) are eligible (Italian Government 2021).

To benefit from the scheme, the home's energy efficiency must improve by at least two energy classes (of eight classes ranging from A+ to G), with an energy performance certificate ('APE') to be carried out both before and after the interventions (Italian Government 2021).

Comparison to the UK

At 110 per cent compensation regardless of household income, it is more generous than any scheme in the UK to date. The 'driving' and 'towed' categories resemble the primary and secondary measures of the discontinued Green Homes Grant scheme, as does the fact that the Superbonus 110% is targeted towards post-Covid economic recovery, having been introduced as part of the Italy's 'relaunch decree', a series of tax incentives to boost the economy after the Covid-19 crisis (Agenzia Entrate 2021).

Effectiveness

The Superbonus 110% aims to address fuel poverty and climate change together and appears to be well designed to promote progress in both areas. Both home insulation and low-carbon heat are included in the principal measures. At the end of March 2021, over 10,000 constructions, worth €1 billion, were reported to be in progress or successfully completed, and residential building renovations are up over 500 per cent since the Superbonus 110% was introduced (Taylor 2021).

However, 'fabric first' and 'whole house' approaches are not specified by the scheme and the installation of a new gas boiler is included as a driving measure. In addition, the minimum energy improvement of two classes is insufficiently ambitious for the lowest efficiency homes. Lastly, administrative hurdles may have prevented some people from participating: a September 2020 survey suggested 3 million Italians had not completed their application because of the number of documents required (Facile 2021).

The scheme is scheduled to close in June 2022, so early success may prove to be a 'bubble', unless the government extends the scheme. Indeed, even green groups are questioning the sustainability of public financing covering the retrofit of all of Italy's homes (Taylor 2021).

5.
SETTING OUT A LONG-TERM, COMPREHENSIVE RETROFIT PLAN FOR THE UK

Public and industry interest in home decarbonisation is high, but confidence in government to deliver clear policy has been shaken. A well-designed, comprehensive policy programme has never been more important. We recommend five core elements that would constitute such a programme: ambitious, long-term standards and regulation; phased, long-term financing; scaling up industry skills; and effective delivery which together will involve raising public awareness and enthusiasm and building institutional capacity.

> ***"The government one year are promoting something and then two or three years later it's out of fashion or it costs a lot more than it did originally."***
> Focus group participant

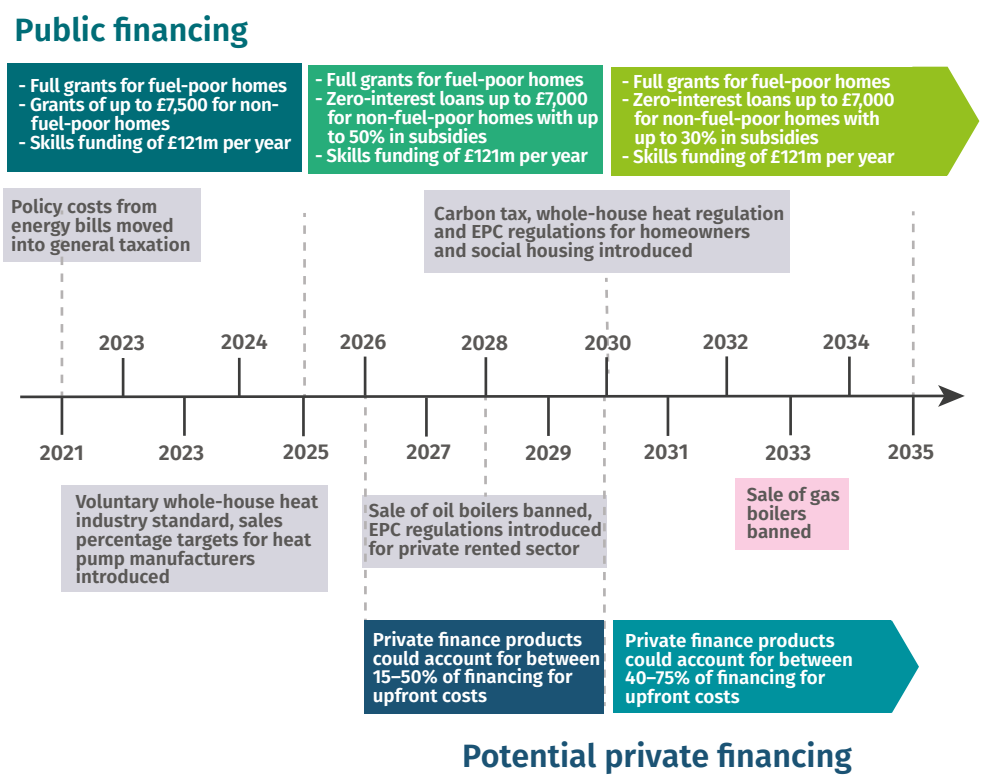
THE IMPORTANCE OF A JOINED-UP APPROACH AND GOOD TIMING

Our recommendations should be viewed as a comprehensive package with a clear timeline for introducing each element. Without this approach, the government risks causing unintended consequences. Without financial support with upfront costs and setting point of sale regulations requiring energy efficiency upgrades and heat pumps, there is a danger of creating 'mortgage prisoners' – occupants who cannot sell or re-mortgage their home (Jones 2021) – as well as pricing many homes out of potential bill savings. If policy support does not make heat pumps attractive enough to motivate switching, households risk being penalised by future carbon taxes. And if the government does not support the scale up in high-quality training, poor quality installation could undermine public trust.

We present a clear timeline of all the policies we discuss in this report to ensure that the government avoids these unintended consequences and instead sets out a comprehensive, well-sequenced policy programme.

FIGURE 5.1

The sequencing of policy will be crucial to avoiding unintended consequences
Timeline of policies described in this chapter



Source: IPPR analysis

SETTING A CLEAR DESTINATION: AMBITIOUS, LONG-TERM STANDARDS AND REGULATION

Clear regulations with reasonable deadlines set a clear market direction and give industry confidence and time to invest in their supply chains and skills. For example, the petrol and diesel car phase out by 2030 has given industry the impetus to increase electric car manufacturing, and created a rapid increase in demand for electric vehicles and a rapid decrease in demand petrol and diesel cars (SMMT 2021). To meet net zero targets in residential buildings, based on our research and the feedback of many stakeholders, we recommend the following regulatory framework:

- **The government should introduce point of rent, point of renovation and point of sale regulations on private rented properties by 2028 and homeowners by 2030 to improve the efficiency of their homes to an EPC rating of C or an equivalent performance-based standard** (see below). **Non-compliance with the regulation should incur a financial penalty** higher than the cost of retrofitting that would be recycled into local council schemes to deliver energy efficiency and low-carbon heating upgrades. To lead by example and support the scale up of retrofit supply chains, as IPPR has previously recommended, the **social housing sector in England13 should also set itself a target of reaching an EPC rating of B for its stock by 2030**.

13 Recognising that commitments have already been made for similar or higher EPC ratings for social housing in Scotland and Wales.

- **The government should introduce 'whole-house heat' as a new regulatory standard by 2030 that requires energy efficiency measures and low-carbon heating to be installed together**, unless energy assessments can demonstrate the property will already support high-efficiency low-carbon heating. Simultaneous energy efficiency and heat pump upgrades should be the gold standard to minimise household disruption. To encourage industry to move towards this approach, we recommend that the **whole-house heat regulation should first be introduced by 2023 as a voluntary industry labelling scheme**.
- **The UK government should ban the sale of residential oil boilers in the UK by 2028 and the sale of residential gas boilers by 2033**. In our YouGov poll, the gas boiler ban proposal was supported by a plurality of respondents (38 per cent) with 35 per cent opposing and 27 per cent unsure. In addition, the government should set an example by **phasing out gas boiler installations by 2030 in all public buildings**. This could also help to boost the skills supply chain for installing low-carbon heating and energy efficiency in advance of regulation for residential gas boilers.
- To support the scale up in low-carbon heating options in anticipation of the technology bans mentioned above, **the government should introduce requirements for existing boiler manufacturers to make a certain percentage of their sales from heat pumps**. This regulation would start at a low percentage in 2023 and the percentage would rise over time as manufacturers increased investment in their supply chains.

A PHASED APPROACH TO LONG-TERM FINANCING

By its nature, long-term policy is difficult for governments that legislate based on short-term electoral cycles. Consequently, below we set out a long-term, phased funding approach that accounts for policy cycles and includes key milestones where public funding can be reviewed and revised downwards depending on technology cost reductions and the availability of private financing. This scheme builds on previous recommendations made by IPPR's Environmental Justice Commission, which calls for a 'GreenGO scheme': a 'one-stop shop' for households to access funding for retrofits and other low-carbon technologies such as electric vehicles (IPPR Environmental Justice Commission 2021) (see box 5.1 below).

THE GREENGO SCHEME

IPPR's Environmental Justice Commission recommends the creation of a new GreenGO scheme – a 'one stop shop' to give people the information and financial support they need. GreenGO would provide a unifying brand under which financial support and high-quality advice can be marketed to, and accessed by, the public. The scheme aims to ensure that the means to take action are available to everyone and accessible on their high streets, as well as online and via a dedicated phone line.

The GreenGO scheme would incorporate the following elements:

- GreenGO grants and loans: GreenGO would streamline all existing government schemes that support the public to invest in cleaner, healthier technologies. This would include those helping with insulation of homes and low-carbon heat (GreenGO Warm), and transport schemes (GreenGO Move) supporting alternatives to private car ownership.
- GreenGO Isas: Modelled on the government's lifetime and help-to-buy Isas, the GreenGO account could add, for example, a 25 per cent bonus to the account holders' investments on a maximum investment

of £1,000 per year. Only net zero aligned and accredited shares and investment funds will be eligible to be held within the account.

- GreenGO and carbon pricing credits: Revenue from future carbon prices on consumer-facing goods and services could be recycled through GreenGO to pay back all households, with low-income households receiving a larger proportion.

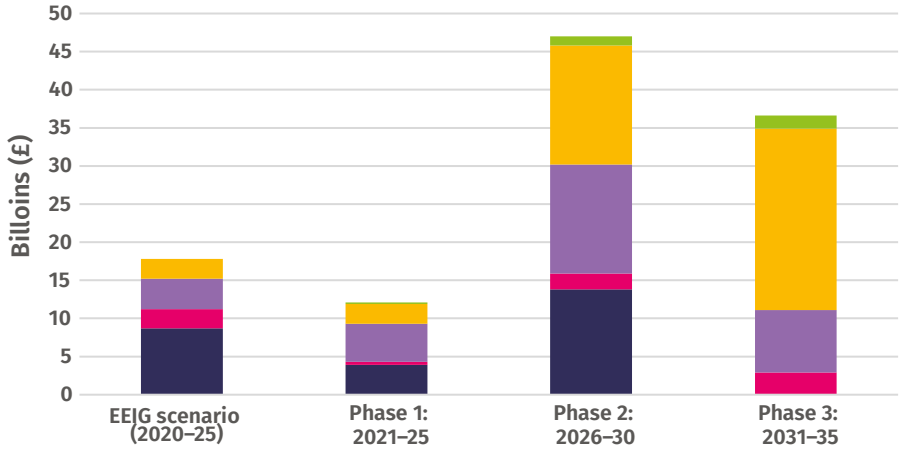
Source: IPPR Environmental Justice Commission 2021

The overall investment needed is highlighted in figure 5.2. Investment is based on the Committee on Climate Change's balanced pathway for reaching net zero emissions in buildings by 2050 but includes the costs of additional measures such as hot water tanks and radiators for fuel poor homes.[14]

FIGURE 5.2

Investment into decarbonising UK homes ramps up substantially by 2025/26

Five-year investment totals by technology across each of the three phases15



Source: CCC 2020b [adapted by IPPR]

Setting out the financing scenarios for decarbonising housing

Within our phased approach, we set out three financing scenarios that explore the balance between public and private financing. Each scenario has the potential to meet the investment and deployment gaps required to achieve net zero targets. However, the likelihood of meeting these targets is highest in scenario 1, which sees public financing throughout, and lowest in scenario 3, in which we make optimistic assumptions about the potential for private financing options to scale up. The three financing scenarios are summarised below:

- **Scenario 1**: Public financing through all three phases
- **Scenario 2**: Majority public financing with introduction of private financing options in second and third phases
- **Scenario 3**: Gradual shift to majority private financing by third phase

In table 5.1 below, we set out the different policies associated with each financing scenario across each phase of our policy programme timeline set out above.

14 The upper figure in the range provided for phase 1 is based on analysis by Energy Efficiency Infrastructure Group that is closely aligned to the Committee on Climate Change's Tailwinds scenario.

15 Energy efficiency installations for fuel poor homes are assumed to be completed by phase 3.

TABLE 5.1

Summary table of financing scenarios

Phases		Scenario 1: Public financing	Scenario 2: Majority public financing with private financing options	Scenario 3: Gradual shift to majority private financing
Phase 1: now–2025	**Public policy**	Full public grants for fuel-poor homes. Public grants of up to £7,500 for energy efficiency and heat pump installation for non-fuel poor homes, including for landlords' rented properties. VAT reductions for renovation works that improve energy efficiency. Stamp duty rebates for buyers based on energy efficiency rating achieved from upgrades.		
Phase 1 public funding		**£12.1 – £17.8 billion**		
Phase 2: 2026–30	**Public policy**	Full public grants for fuel-poor homes. Zero-interest loans of up to £7,000 for energy efficiency and heat pump installation for non-fuel poor homes, including for landlords' rented properties. The loan would include a repayment subsidy of up to 50 per cent of upfront costs based on the new energy efficiency of the property (using an EPC rating and performance-based measurement), including for landlords' rented properties. Continuation of VAT and stamp duty rebate incentives. Carbon taxation introduced at the end of the phase with rebates for fuel-poor homes.		
	Private funding	**n/a** – all financing provided through public policy	The main private finance options would include 'add-on' green mortgages, demand-aggregated financing, and community municipal bonds. In the case of demand-aggregated financing, government could also facilitate auctions between lenders competing to fund large-scale retrofitting and offer to pay interest rates.	
			Private finance products ramp up to offer 15 per cent of total financing for upfront costs.	Private finance products ramp up to offer 50 per cent of total financing for upfront costs.
Phase 2 public funding		**£47 billion**	**£20 billion16 (£40 billion before loan repayments)**	**£11.8 billion (£23.5 billion before loan repayments)**
Phase 2 private funding		-	**£7 billion**	**£23.5 billion**
Phase 3: 2031–35	**Public policy**	All schemes continuing with zero-interest loan scheme reducing to £6,500 and repayment subsidies reducing to 30 per cent of upfront costs.		
	Private funding	**n/a** – all financing provided through public policy	The main private finance options would include 'add-on' green mortgages, demand-aggregated financing, and community municipal bonds. In the case of demand-aggregated financing, government could also facilitate auctions between lenders competing to fund large-scale retrofitting and offer to pay interest rates.	
			Private finance products ramp up to offer 40 per cent of total financing for upfront costs.	Private finance products ramp up to offer over 75 per cent of total financing for upfront costs.
Phase 3 public funding		**£36.6 billion**	**£6.6 billion17 (£22 billion before loan repayments)**	**£2.7 billion (£9.1 billion before repayments)**
Phase 3 private funding		**-**	**£14.6 billion**	**£27.5 billion**

Source: Foster et al 2020, CCC 2021, IPPR analysis

16 Figure represents maximum cost after loan repayments as it assumes all homes receiving zero-interest loans would receive the maximum 50 per cent repayment subsidy.

17 Figure represents maximum cost after loan repayments as it assumes all homes receiving zero-interest loans would receive the maximum 30 per cent repayment subsidy.

Key principles underpinning the phased funding scheme

There are several key principles which we recommend must underpin the design of the phased funding scheme.

Debt-financed public funding

We recommend public financial support should primarily be funded through debt financing for three key reasons. First, given the particularly high job creation potential of energy efficiency and low-carbon heating retrofit (see chapter 1), and the 1.6 million job creation opportunity from investing to reach net zero more generally (IPPR Environmental Justice Commission 2021), increased borrowing could be serviced through greater tax revenues from job creation rather than higher tax rates. Second, given recent low interest rates, this is an attractive time to borrow and borrowing has been a key feature of economic policy in Germany, France and the wider European Union (Thorpe 2020). Finally, there is an increasingly narrow window of opportunity to enact this policy: as national debt financing grows across Europe, the risk of interest rate rises also increases. This will make borrowing less attractive and add to the proportion of funding that will need to come from higher tax rates.

Public funding will decrease over time

Across all financing scenarios, technology cost reductions will decrease the amount of public funding needed. In our scenarios above, grant figures are based on Element Energy modelling that estimates average cost reductions for all heat pumps of around 20 per cent by 2035. However, upper estimates for this modelling suggests that costs for air-source heat pumps could be reduced by 30 per cent by 2030 and 40 per cent for ground-source heat pumps (Foster et al 2020). Recently, Octopus Energy have gone further to suggest that they could halve the cost of heat pump installations within 18 months (Beament 2021).

The transition between financing methods must be gradual and clearly communicated

As experience from the Energy Company Obligation (ECO) scheme has demonstrated, cuts to public funding can result in corresponding drops in the number of installations for the technology being incentivised (Webb et al 2020). Consequently, any transition between public and private financing, or indeed from grants to loans, must involve clear and early communication to reassure stakeholders that funding levels will remain consistent. Transitions in financing methods must also involve listening sessions with people and consumer groups, and the government should be prepared to continue with grants if loans or private financing methods are seen as less desirable.

Property-based financing

Across all financing scenarios where policies result in households making repayments, the government could consider attaching these repayments to the property rather than the occupants. When combined with zero-interest government loans with repayment subsidies proportionate to increases in energy efficiency, this property-based financing approach could make upgrading homes to higher standards more appealing, since houses with larger subsidy payments attached are more attractive to prospective buyers. This not only increases demand but could help counter the unattractiveness of long payback times.

Key features across all scenarios

Across all three scenarios, we include the following key policy measures.

- **GreenGO grants** in the first phase (now to 2025) of our policy programme. This reflects stakeholder feedback which overwhelmingly cited the need for public financial support to 'pump prime' the market for at least the lifecycle of the current Parliament. The specific amount proposed for GreenGO grants and then loans (£7,500 falling to £6,500 by 2035)[18] is based on the average cost of installing energy efficiency measures (equal to or less than £1,000) for the majority of households (63 per cent) and heat pump upgrades (around £6,500 on average). In our YouGov poll, these recommendations for grants and loans with subsidies, including the caveat that any additional costs would be similar to or less than a gas boiler, were supported by 62 per cent and 61 per cent of respondents respectively.
- **Full GreenGO grants for fuel poor homes** for both energy efficiency, heat pumps and other measures such as hot water tanks and radiators at an average cost of £12,000 per fuel poor home, falling to £9,500 between 2031–35. This approach draws from the French example which increases funding for lower income households and echoes calls from a broad coalition of green groups and industry stakeholders as part of a 'fair heat deal' (E3G 2021). As one focus group participant said, 'as a person on a low income I would like something like that [a grant]'. We also assume these grants will largely be delivered through the Local Authority Delivery scheme and Home Upgrade Grant which targets fuel poor off-grid homes. This recommendation was supported by 66 per cent of respondents in our YouGov poll.
- We echo the call from many industry stakeholders for **stamp duty rebates and VAT exemptions** to provide incentives to prospective buyers and homes looking to undertake renovations respectively (Adams 2021; Killip et al 2021).
- Drawing from examples in Italy and Germany, phases 2 (2026–30) and 3 (2031–35), public funding switches from a public grant to a **zero-interest loan with subsidy incentives** for repaying loans proportionate to increases in energy efficiency ratings achieved. Zero interest loans were also popular among our focus group participants, as one noted: 'if you can't get a grant, how about having a loan and having it interest free if this is what the government wants us to do'.
- We recommend the introduction of a **carbon tax on fossil fuel-based heating in 2030** which would increase energy bills and provide an additional incentive to switch to electricity-based heating. We choose this date as we anticipate that, by this time, heat pumps will be a well-established alternative to gas boilers in which households have the confidence to invest. Crucially, the introduction of carbon taxation would also involve rebates for fuel poor homes that still have gas boilers by this time and the carbon tax would be signalled well in advance of its introduction. In our YouGov poll, this recommendation, with the caveat that it would only be introduced when the costs of low-carbon alternatives are the same or cheaper than gas boilers, was supported by 41 per cent of respondents, opposed by 32 per cent with 27 per cent unsure.

The role for private finance

While maintaining public financing across all scenarios, scenarios 2 and 3 introduce the potential for private financing methods to play a larger role from 2026 onwards. While there are currently many options being considered by the finance industry, we highlight some of the most promising financing methods which we assessed in box 5.2 below.

18 Note: Polling was only conducted for the £7,500 figure.

EXAMPLES OF PRIVATE FINANCING

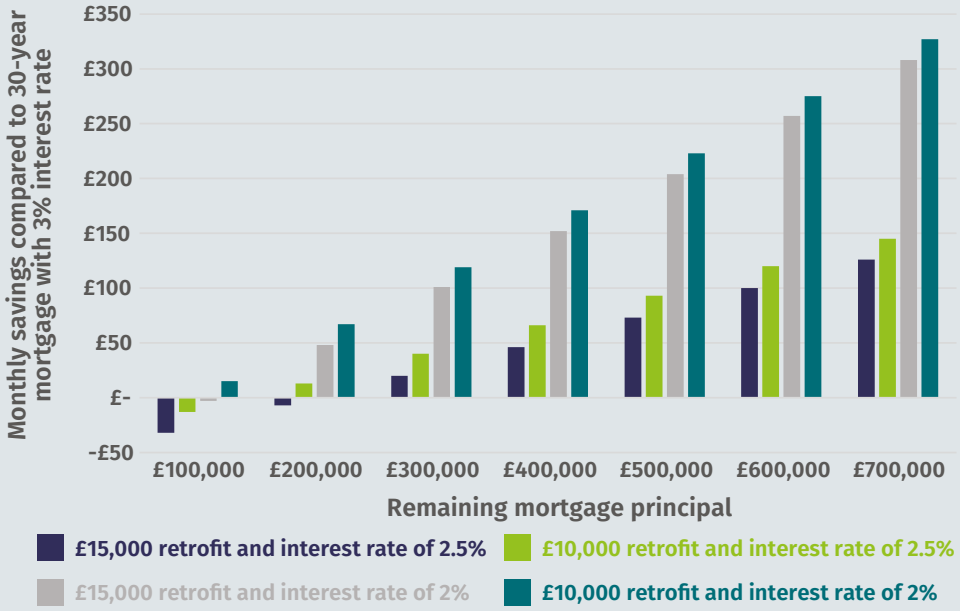
Green mortgages

Green mortgages currently represent a very small proportion of the mortgage market and tend to focus on people looking to buy homes, but with the right public policy to drive demand, they could represent a sizeable opportunity for the approximately 11 million existing mortgage holders in the UK (UK Finance 2019). As figure 5.3 below shows, if households added the cost of retrofits to their remaining mortgage principal in return for lower interest rates, the majority of homes would experience savings on their mortgage repayments. From the lender perspective, the incentive to reduce interest rates could come from the lower risk of foreclosure due to monthly savings, combined with potentially increased property value from the retrofit upgrades made (GFI 2020).

FIGURE 5.3

Most households who add the cost of retrofitting to their mortgage, refinance and receive interest rate reductions in return could see monthly savings

Monthly savings compared to 30-year mortgage rate with a 3 per cent interest rate, by mortgage principal remaining



Source: IPPR analysis using online mortgage calculator and Ostrowski 2021

Demand-aggregated financing

Demand-aggregated financing involves local authorities or a regional energy hub offering loan financing to a specified 'threshold number' of homes (for example, 25,000). Once this threshold is met, private investors could bid to finance loan schemes with reduced interest rates due to economies of scale. This scale would also benefit manufacturers and installers who would have a sizeable, guaranteed demand. To drive costs down further, the government could introduce and facilitate an auction mechanism where lenders would compete to offer the lowest interest rate. The government could also agree to pay for the interest rates of the winning provider, effectively turning the scheme into a zero-interest loan.

Community municipal bonds

Local or regional authorities could introduce 'community-based municipal bonds' which would require a similar threshold number of homes but would instead take a crowd-funding approach. Once the threshold was reached, a local authority would issue a bond which local households could invest in. This could have the benefit of creating community interest and a sense of ownership over retrofitting schemes since households could be both the investors in, and recipients of, energy efficiency and low-carbon heating upgrades. With enough community interest, organising bodies could also look to leverage private capital, using the community interest as evidence of large-scale demand.

Comparison of savings

Whether public or private, as table 5.2 below shows, every financing option involving repayments would result in net monthly savings to households – bills savings from energy efficiency and heat pump installations after subtracting repayment costs. However, industry stakeholders were clear that the extent to which private financing options can scale up will first depend on demand created by public financing. In other words, government should not wait for these initiatives to develop on their own.

TABLE 5.2

Every financing option involving repayments would result in net monthly savings for households

Comparison of savings from different financing methods in 2026[19]

Financing method	Upfront costs to household	Monthly costs to household	Net monthly savings
Government zero-interest loan of £7,000 with maximum 50 per cent repayment subsidy, over 20 years	Approximately £3,500 for additional measures[20]	£14.60	£145.40–£185.40
Green 'add-on' mortgage for retrofit cost of £10,000 with repayment over 30 years	None	Variable depending on interest rate reduction and mortgage principal remaining. Figure 5.3 above provides a range between costs of £13 and savings of £327.	£147–£527
Demand-aggregated financing for retrofit cost of £10,000 with zero-interest repayments over 20 years	None	£41.66	£118.34–£158.34

Source: IPPR analysis

Public policy to maximise bill-saving potential

Bill savings were a factor for our focus group participants; as one noted: 'for me the cost of buying the equipment should be paid in the savings on your bill'. The government could further boost the bill savings achievable by tackling current energy pricing and promoting smarter navigation of the energy market.

19 We have not included community municipal bonds in this analysis as the funding is from individual households rather than a larger financial organisation, but we acknowledge this method as an important financing option.

20 Such as hot water tanks, new radiators and replacing gas appliances.

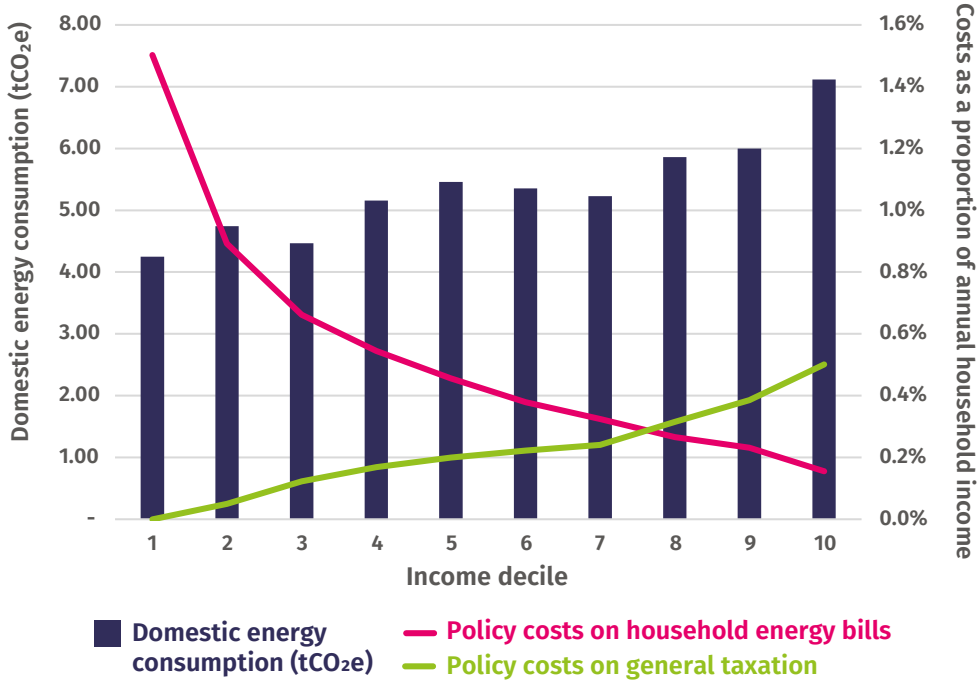
Reforming energy bill pricing

As an immediate priority to incentivise uptake of heat pumps, **the government should move the policy costs levied on energy bills into general taxation**. As figure 5.4 shows, this would immediately reduce bills for 70 per cent of households, distribute costs more fairly according to each household's carbon footprint, and increase costs to the highest earning households as a proportion of annual household income by just 0.35 per cent (Barrett et al 2018). Research by Public First further suggests that moving policy costs to general taxation could reduce the average energy bill of fuel poor homes by up to £178 a year and the overall average energy bill by £168 per year (Wolf et al 2021).

FIGURE 5.4

The cost of renewable energy generation recovered through general taxation would result in lower bills for 70 per cent of homes compared to the current levy on energy bills and distribute costs more fairly according to carbon footprint

Domestic energy consumption and additional costs as a proportion of household income by decile from levies on household energy bills vs general taxation



Source: Leeds SRI[21] and Barrett et al 2018 [adapted by IPPR]

Time-varying pricing

Changes to energy consumption patterns can also help to reduce bills. For example, time-varying tariffs operate either by prompting customers to use energy when prices are low, or by performing this function automatically. Research by the Regulatory Assistance Project (RAP) suggests that automatic time-varying pricing with a heat pump could reduce bills by more than 50 per cent with minimal input needed from the household to manage the operation of the heat pump (Lowes et al 2021). To maximise the benefits of these tariffs while ensuring customer protection, the **government should convene industry stakeholders and consumer groups to establish a 'customer charter'** that would set out criteria to ensure that households understand how to use these technologies and experience no disruption from them.

21 Data available on request.

SCALING UP INDUSTRY SKILLS

To meet the demand set by public policy and build public confidence in the performance of low-carbon technologies, the retrofit industry must be encouraged to invest in the right kinds of skills and scale up training. Achieving this will require building on existing standards, enforcing high-quality installation, and investing in skills training.

Improving training and job standards

To minimise disruption to the consumer and reduce the risk of complications in installation, training standards need to move towards requiring the installation of energy efficiency and low-carbon heating at the same time. In the short term, we therefore recommend **the government works with key industry stakeholders (including unions, the Construction Industry Training Board, the Federation of Master Builders, the Insulation Assurance Authority, the UK Green Building Council, the Construction Leadership Council, the Energy Efficiency Infrastructure Group and the Microgeneration Certification Scheme, and Trustmark) and through skills academies (see below) to expand existing training standards by 2023**. This will involve developing PAS2035 regulations to require all retrofit designers and installers to be able to install energy efficiency measures compatible with low-carbon heating. Correspondingly, this expansion will require all MCS qualified installers to understand how low-carbon heating will perform within the overall heating system. These regulations should be updated and included within the upcoming ECO4 programme. In the longer term, the 'whole-house heat' labelling scheme mentioned above, introduced as a voluntary standard in 2023 and a regulation by 2030, would act as a demand driver to encourage installers to bring together their supply chains.

To increase the attractiveness of the sector to new labour market entrants and provide reassurances to workers looking to retrain, the government should, as IPPR's Environmental Justice Commission has previously recommended, work with the stakeholders mentioned above and **commit to introducing high-quality job standards for the retrofitting industry**. These standards should be co-developed by workers and unions in particular and include criteria such as reasonable working hours; safe-working environments; flexible working; protection of workers' rights; opportunities for training and career progression; decent pay; job security and diversity.

Quality assurance of training

To prevent installers and certification bodies from 'gaming the system', **we recommend that the government should remove the 'pay to pass' model of training** for all retrofitting training courses. In addition, **we recommend that the government should expand TrustMark's resources to clamp down on certification bodies that do not check the quality of installations on site**.

Financial support for training

To meet both the scale of installations required to reach net zero and the new proposed training standards above, **the UK government should allocate £160 million per year to 2028 for low-carbon heating and energy efficiency training course costs** for both existing workers and new labour market entrants.[22] This funding should be in addition to the new lifetime skills guarantee, as part of an

22 We estimate this figure by looking at the annual cost of training 350,000 workers by 2028 as per CITB 2021. We assume a ratio of 8:2 existing workers to new apprentices. We use a bottom-up rapid review of course costs (including NVQ level 2, PAS2035 and MCS accredited training) to estimate average course costs for existing workers of approximately £3,000 per worker. We assume apprenticeship costs to be £4,000 per apprentice based on government incentive payments for the apprenticeship levy (EFSA 2021). Note, these jobs figures differ from the 138,000 jobs set out above as they only account for jobs created in the sector rather than jobs being lost elsewhere.

annual £1.1 billion Green Training Fund recommended by IPPR's Environmental Justice Commission (IPPR Environmental Justice Commission 2021).

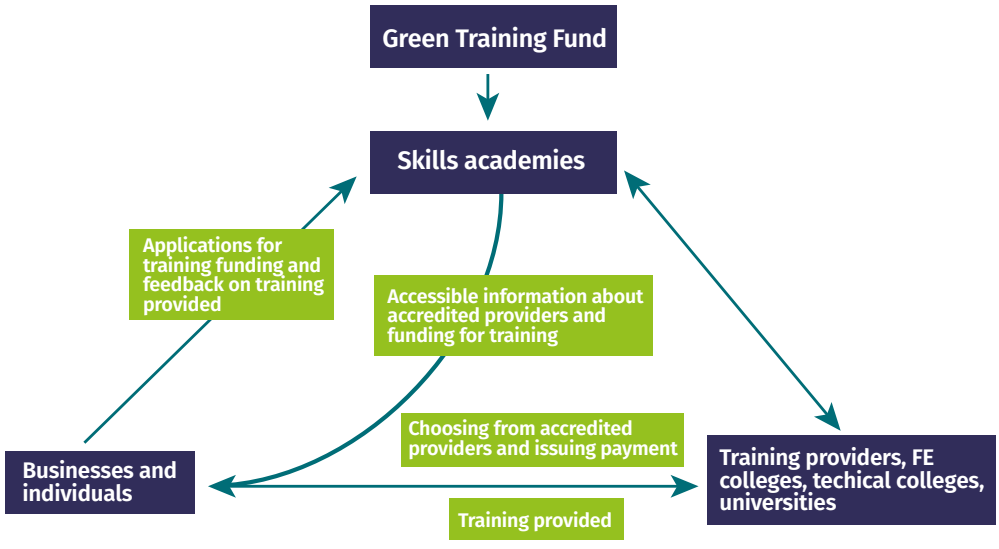
To distribute funding and to support the rollout of high-quality training, **the government should reintroduce skills academies**. The key tasks of these academies would include the following (summarised in figure 5.5):

- Working with key stakeholders including trade unions to identify upskilling, reskilling and new skills needs and ensure training leads to high-quality jobs.
- Supporting TrustMark and MCS to accredit training providers and to ensure that all training for existing workers and new labour market entrants adheres to quality standards.
- Monitoring and evaluating training by receiving feedback from trainees and businesses on the quality of their training courses.
- Providing an easily accessible online platform of accredited providers and an over-the-phone advice service for installers or individuals seeking training.
- Financing companies and individuals applying to access this training through the Green Training Fund or existing skills funding.
- Awareness raising of training opportunities and support to businesses and individuals.
- Developing 'skills passports' for workers with existing transferable skills to remove the burden of paying for certification of skills that they already have.

FIGURE 5.5

Skills academies can help businesses and individuals access funding for training and connect them with accredited training providers

Diagram demonstrating the role of skills academies



Source: IPPR analysis

To cover the cost of foregone wages during training, **the government should consider introducing paid skills sabbaticals** for the length of training that installers need to undertake, ensuring they do not have to worry about a source of income in the meantime. This could involve businesses deducting a proportion of training costs from taxes. This policy could be particularly helpful for micro-businesses that operate largely as contractors who may not otherwise have the time to undertake training.

EFFECTIVE DELIVERY

Competent delivery of any government scheme is crucial to both industry and public confidence. Achieving this will require: providing clear, comprehensive and accessible information and advice to households; minimising disruption to homes; ensuring competent national and regional coordination to prevent bottlenecks; adopting area-based approaches that empower local councils to identify homes most in need of upgrades; and ensuring that the performance of these upgrades is properly measured.

Clear information campaign to ensure public trust

Clear information is crucial to raising public awareness, understanding and enthusiasm for low-carbon heating. To this end, **we recommend the government should introduce a large-scale national information campaign**. This recommendation was supported by 65 per cent of respondents in our YouGov poll. This campaign should have the following components:

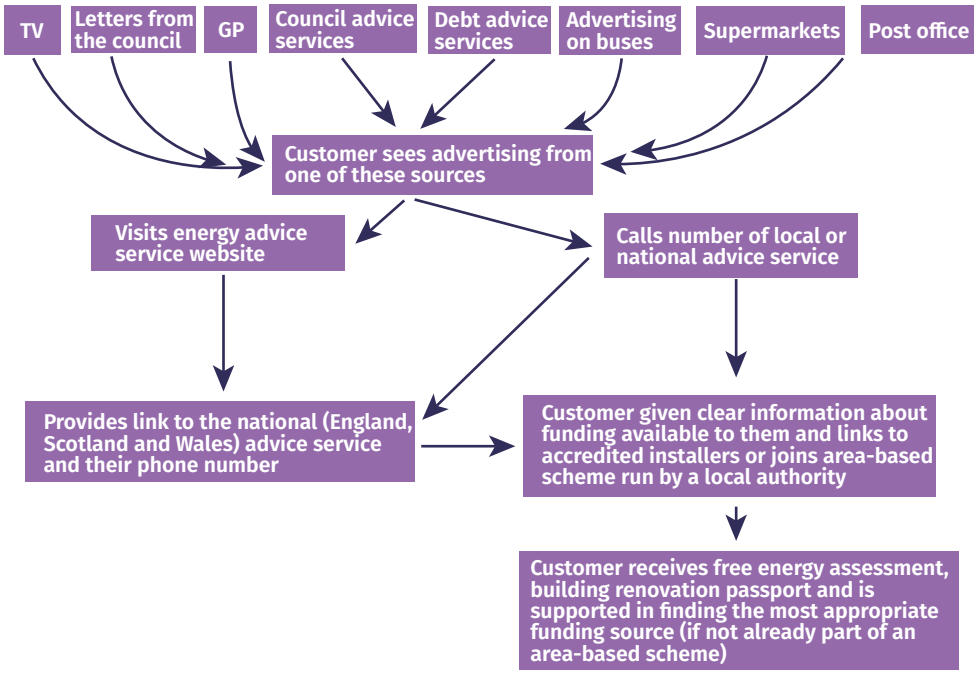
- **National advertising** using accessible, clear language on television, online and at locations people regularly use such as council services, job centres, post offices, debt advice services, GPs, banks and supermarkets. In our focus groups, the digital television switchover campaign was mentioned as a good example. As one participant put it, 'the government needs to introduce some jazzy advertising to sell this to us'.
- **A cross-referral mechanism** whereby services can refer households to energy advice services, benefits support or both.
- **A properly resourced energy advice service for England online and over the phone modelled on Home Energy Scotland.** Almost every stakeholder we interviewed pointed to the need for government to re-introduce national energy advice services with proper capacity to provide bespoke over-the-phone and online energy saving advice, help direct them to public and potentially private funding schemes, find accredited installers, and navigate different schemes to find the most appropriate support for their needs. In anticipation of greater use of these services, further resources should also be provided for advice services in Scotland and Wales. Our focus groups echoed this desire for more information and evidence, with one participant noting, 'I'd need an awful lot more information…[and] objective independent analysis of the situation before I go ahead'.
- **Building renovation plans** carried out by experts for each home which would set out a bespoke, long-term plan for energy efficiency upgrades and low-carbon heating, with additional information about adaptation measures and funding which homes can access. This information could then be passed to new owners if the house is sold (GFI 2021b).
- **Creating new residents' associations** which would receive and collectively discuss building renovation plans for whole blocks of flats.
- **Consistent branding**. Across all parts of this information campaign, there should be consistent branding using the GreenGO label to give households confidence in the scheme.

Figure 5.6 gives an example of a person's experience interacting with the different elements of this national information campaign.

FIGURE 5.6

Households should be able to interact with the GreenGO scheme through a range of different services that they are most likely to use

Diagram setting out how a national information campaign would help households engaging with the GreenGO scheme



Source: IPPR analysis

Increasing local authority capacity

Any retrofitting policy programme will require a combination of individual household demand for financial support and area-based schemes where local authorities proactively reach out to households within a given area, potentially on a street-by-street basis. The Local Authority Delivery scheme has been welcomed by many stakeholders, but to avoid a postcode lottery where only those councils with capacity can apply, **we recommend that the government expand the capacity of local energy hubs to support local authorities with the continued delivery and expansion of the Local Authority Delivery scheme**.

Scheme administration

As the Green Homes Grant has demonstrated, a competent administrator is crucial to successful delivery. So far in our recommendations we have proposed that energy advice services help households navigate different funding options for retrofitting, skills academies help installers access funding for training, and local energy hubs support local authorities to apply for funding and continue to deliver the Local Authority Delivery scheme. To provide nation-level coordination, **we recommend that the UK government and devolved administrations create national energy retrofit agencies**. These agencies would coordinate the institutions we mention above and communicate future changes to programmes, such as the implications of moving from public grants to subsidised zero-interest loans.

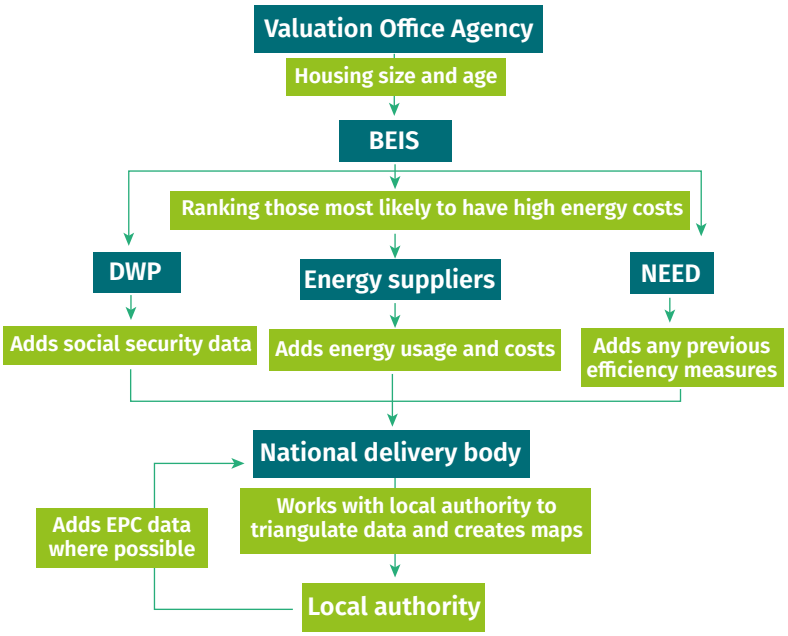
Improving data sharing

Data-sharing between institutions and government departments could substantially improve local authorities' ability to conduct heat zoning that would identify which heating technologies may be best suited to their housing stock and help them to prioritise and reach out to fuel poor homes. In figure 5.7, we therefore propose a data-sharing approach which could achieve these objectives.

FIGURE 5.7

Data-sharing between multiple national and local government organisations can help to identify homes most in need of cost-saving upgrades

Diagram showing how data can be shared between government organisations



Source: Webb et al 2020

Moving towards real-use performance measurement

In the long-term, a move towards better real-use performance measurement will be necessary to ensure market and household confidence. From 2025, **the government should introduce new performance measurement standards that could run parallel to EPC ratings and eventually replace them**. As an example of what this standard could look like, recent studies from the Department for Business, Energy & Industrial Strategy have demonstrated how smart meters can be used to measure heat loss in a home and hence performance of energy efficiency measures (BEIS 2021b). To avoid a situation where landlords and homeowners take no action to upgrade their properties until the 2025 review of performance-based measurement, **the government should provide an exemption to any new performance-based standard for properties that installed upgrades that led to an EPC rating of B or above**.

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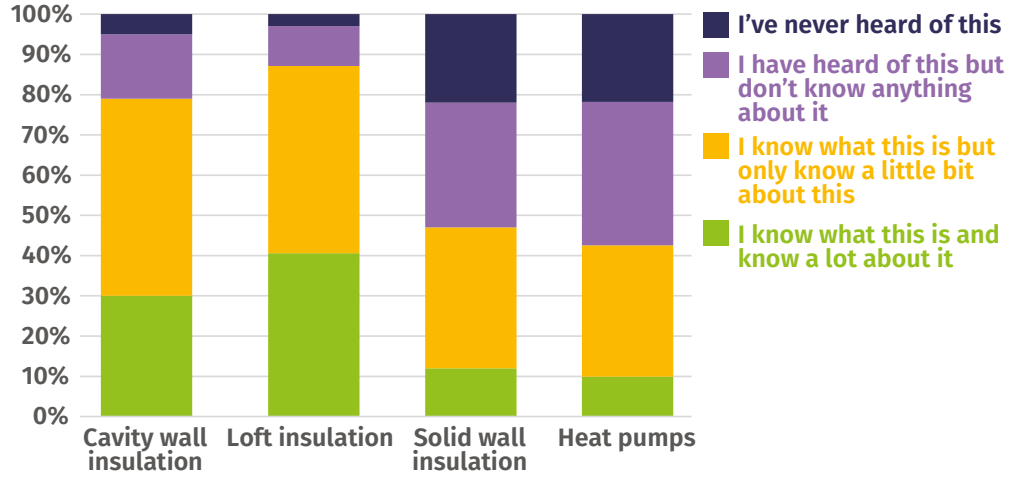
APPENDIX

FIGURE A1

Polling responses when asked: 'How much, if anything, do you know about each of the following...'

Respondent answers by technology and level of familiarity

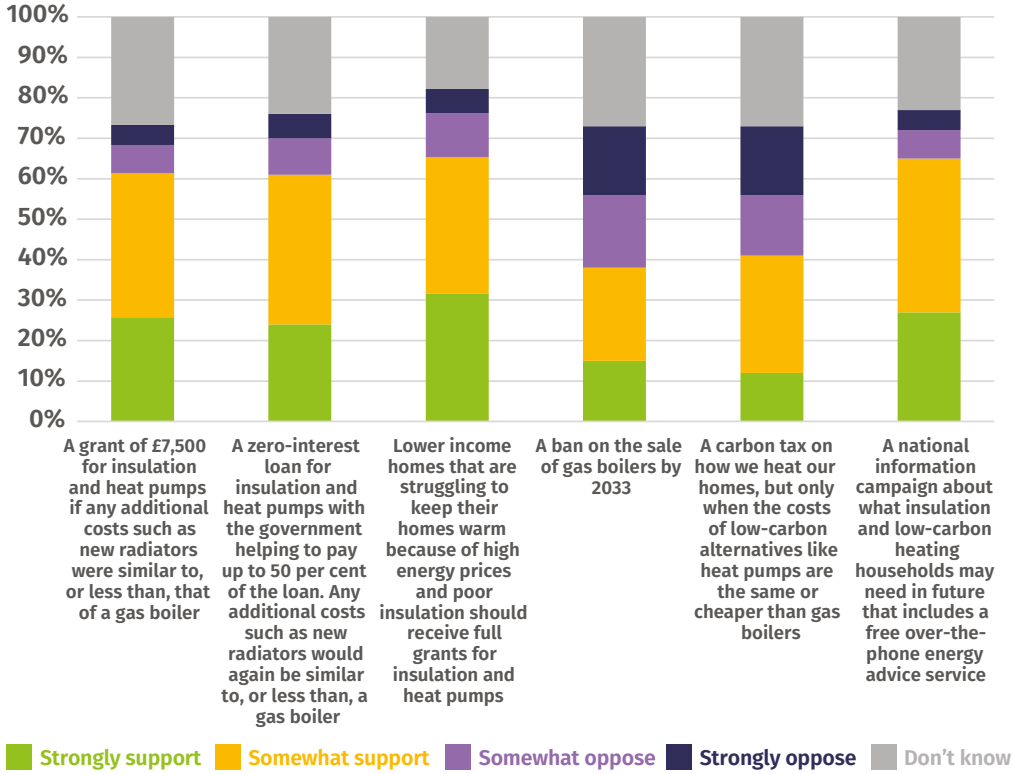


Source: IPPR analysis

FIGURE A2

Polling responses when asked: 'In principle, to what extent would you support, or oppose, the UK government introducing the following policies?'

Respondent answers by policy recommendation and level of support



Source: IPPR analysis

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