UNIVERSITY OF CAMBRIDGE | CISL Cambridge Institute for Sustainability Leadership

Delivering Retrofit at Scale Together:

Better homes for healthier, resilient and stronger communities

Funded by UK Government

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The University of Cambridge Institute for Sustainability Leadership (CISL)

CISL is an impact-led institute within the University of Cambridge that activates leadership globally to transform economies for people, nature and climate. Through its global network and hubs in Cambridge, Cape Town and Brussels, CISL works with leaders and innovators across business, finance and government to accelerate action for a sustainable future. Trusted since 1988 for its rigour and pioneering commitment to learning and collaboration, the Institute creates safe spaces to challenge and support those with the power to act.

Cambridge City Council

Cambridge City Council was among the first councils in the UK to declare climate and biodiversity emergencies in 2019, and has committed to getting its own operations to net zero by 2030.

Since then, Cambridge was named an 'A' list city in 2023 and 2024 in the Carbon Disclosure Project's global rankings, while also being recognised as a top performing council in Climate Emergency UK's Council Climate Action scorecards – both of which acknowledge the council's ongoing work to mitigate and adapt to climate change.

With 27% of the city's carbon emissions currently come from people's homes, the council's commitment to building better new homes and retrofitting older homes plays a vital role in bringing down energy costs for residents, making people's lives healthier, and reducing household emissions across the city.

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Contents

Glossary

ABS	Area Based Scheme
AI	Artificial intelligence
BER	Building Energy Rating
CCC	Climate Change Committee
CDFI	Community Development Finance Institution
CERP	Cambridgeshire Energy Retrofit Partnership
CITB	Construction Industry Training Board
CLCCG	City Leaders Climate Change Group
ECO	Energy Company Obligation
EPC	Energy Performance Certificate
ESG	Environmental, social and governance
FCA	Financial Conduct Authority
GHG	Greenhouse gas
GIS	Geographic Information System
HMO	House in multiple occupation
HUG	Home Upgrade Grant
IEA	International Energy Agency
IMD	Index of Multiple Deprivation
IPPR	Institute for Public Policy Research
KPI	Key performance indicator
LAD	Local Authority Delivery
LARA	Local Area Retrofit Accelerator
LPG	Liquefied petroleum gas
MEES	Minimum Energy Efficiency Standards
NHS	National Health Service
PAYS	Pay-As-You-Save
PLF	Property-linked finance
PPP	Public–private partnership
PV	Photovoltaic
RAW	Retrofit Action Week
RIBA	Royal Institute of British Architects
ROI	Return on investment
SEAI	Sustainable Energy Authority of Ireland
SEC	Sustainable Energy Community
SMART	Sustainable Market for Affordable Retrofit Technologies
SME	Small to medium-sized enterprise
UKGBC	UK Green Building Council
WH:LG	Warm Homes: Local Grant

Executive summary

This research was commissioned by Cambridge City Council with funding from the Council and the UK Shared Prosperity Fund. The purpose of the project was to ***identify key opportunities and challenges to residential retrofits*** *in the Greater Cambridge area and, building on this evidence, draw* ***actionable recommendations to accelerate retrofits*** *in the area.*

In this context, 'retrofit' was defined as a process of making improvements to a home to make it more energy efficient. These measures include improvements to insulation of walls, floors, lofts, windows and doors. Retrofits may also include solar photovoltaic (PV) installation and upgrades to heating, hot water and lighting.

The UK housing stock is among the oldest and leakiest in Western Europe, heated predominantly with fossil gas. For the UK to meet its medium- and long-term greenhouse gas (GHG) reduction targets, approximately 29 million homes need to be retrofitted with better insulation and electric heating technologies in the coming decades. Despite significantly higher than average incomes, house prices and rents in the area, the quality of homes in Greater Cambridge is similar to the national average, indicating a considerable need and opportunity for retrofits to improve housing standards. Beyond emissions reductions, retrofits would improve comfort and energy efficiency, reduce fuel poverty and help eradicate unhealthy housing conditions. Carefully targeted and adequately funded retrofits could help reduce wealth and health inequalities, which are exceptionally high, especially in Cambridge City. Accelerated retrofit activity would also present substantial opportunities for job creation and economic growth.

Many of the key challenges to scaling retrofits in Greater Cambridge are similar to those seen across the UK. These include high upfront costs, low consumer awareness, concerns over the level of disruption, limited funding and complex design of many of the available schemes, and the age, complexity and diversity of the housing stock. However, **some challenges are linked to local contextual conditions** such as high housing costs and large numbers of heritage listed homes.

The retrofit potential in Greater Cambridge is significant, but realising it requires a co-ordinated, well-resourced, and locally tailored approach. Cambridge City Council and South Cambridgeshire District Council are actively promoting and supporting retrofit, in addition to retrofitting their own housing stock. The two councils have successfully collaborated to raise funding for retrofits under the Warm Homes: Local Grant and to deliver projects such as the Action on Energy scheme, which offers guidance and a trusted contractor framework to all homeowners. However, they are keen to act more decisively and in partnership with others to understand and address factors that hinder scaling of retrofits in the local communities.

Combining a literature review with a stakeholder mapping exercise and qualitative research, this research identified four key areas where Cambridge City Council could intervene to promote retrofitting of the residential building stock: **policy and governance, finance, skills, and awareness and engagement**. Each of these themes involves barriers at the national, local, and household levels that must be overcome. In this report, the analysis is organised thematically, with national level challenges, local perspectives and recommended actions detailed under each theme.

At the national level, policy instability and the lack of a comprehensive, long-term retrofit strategy create a sense of uncertainty, deterring investment among users, service providers and educational establishments. Policy U-turns and the lack of consistent commitment are reflected in the short-term duration of many funding programmes and frequent revisions to standards, making it risky for all stakeholders to draft long-term plans. Local respondents were particularly concerned about building regulations that allow newbuilds that will eventually need to be retrofitted. Considering the significant size of the private rented sector in the area, unclear guidance for landlords presents a barrier to retrofit investment among them.

In addition to simplifying their own planning processes, local authorities can improve the situation through effective policy advocacy at national level.

Financial constraints are a significant barrier to retrofits across the country. **In Greater Cambridge, the financial challenges are partially different from the national norm.** High house prices and rents mean that many owner-occupiers and landlords do not qualify for government grants, while volatile interest rates and the high cost of living disincentivise them from seeking debt financing for retrofits. Moreover, Greater Cambridge has many heritage listed properties and conservation areas, which necessitate tailored approaches, specialised solutions, skilled expertise and planning permissions – all of which slow down the process and increase costs. Although the national funding system needs to be streamlined, stabilised and made easier to navigate, it also needs to cater for regional variation, offering full cost coverage for those most in need and partial coverage for others – in all parts of the country. Local authorities need more autonomy in managing funding and eligibility criteria.

A substantial skills gap exists in the retrofit sector, necessitating more trained workers as well as high-quality training programmes that equip people with sufficient practical skills and confidence to deliver retrofits. Clear career pathways and consistent work pipelines are essential to address this shortage, and current short-term funding schemes create demand fluctuations. In the Greater Cambridge context, respondents expressed some concerns over availability of suitably skilled professionals who are based locally, and the willingness of service providers from other parts of the country to take on small-scale projects in the area.

Effective communication and engagement are crucial for scaling up retrofits. Homeowners and landlords need clear, accessible and trusted information about retrofit options, available support, skilled workers, and long-term benefits. Messaging needs to be tailored to address specific stakeholder concerns, focusing on practical advantages. Communication and co-ordination between local authorities, contractors and residents could be strengthened further, with local authorities assuming a leading role in facilitating collaborative activities.

Based on our analysis, we develop some overarching recommendations presented below:

1. **Collaborate with key stakeholders to develop a data-driven retrofit strategy:** Conduct a comprehensive housing stock and public attitudes survey to inform tailored intervention pathways to be delivered together with key stakeholders.

2. **Collaborate in national policy advocacy:** Partner with other councils facing similar retrofit challenges and engage with national advocacy organisations (eg, Institute for Public Policy Research (IPPR), Royal Institute of British Architects (RIBA), UK Green Building Council (UKGBC) to collectively influence policymakers.

3. **Strengthen Action on Energy:** Enable Action on Energy to increase staffing and better use digital infrastructure to expand targeted multi-channel awareness campaigns.

4. **Explore additional funding routes and innovative financing options:** These could include establishing a council-backed revolving loan fund for 'able-to-pay' residents, leveraging community benefits funds from renewable energy companies, or collaborating with academics and contractors to apply research funding for retrofitting heritage listed homes.

5. **Enhance targeted stakeholder engagement:** Leverage council influence to convene and support the local retrofit ecosystem by appointing liaisons, fostering partnerships and empowering community groups. This could include working with skills commissioners, local colleges and contractors to promote and develop retrofit skills training.

6. **Assess impact and centralise data:** Implement a robust project management system to track initiatives against key performance indicators (KPIs), and create a central portal that provides access to information on all local retrofit schemes, case studies and resources to improve accessibility and spotlight ongoing work.

The following table summarises the recommendations:

	National-level advocacy	Local level
 **Policy and governance**	Stronger, more coherent and more stable national policies Stamp duty reductions for more energy-efficient homes Greater powers for local authorities on matters related to housing stock and planning Electricity market reform to make retrofit technologies/electrification more viable and cost effective	Develop a comprehensive local retrofit strategy Streamline planning processes for retrofit projects Provide social and private sector landlords with greater support and incentives Strengthen and expand collaborative relationships with other local authorities, housing associations and community-led initiatives, such as Sustainable Energy Communities (SECs) Consider implementing local building regulations if/when this becomes possible
 **Finance**	Increased funding for retrofit programmes, with simplified application and clear information on eligibility and coverage Reinstatement of tax incentives for key stakeholders, such as private sector landlords	Facilitate access to national funding by providing grant application support Explore innovative financing mechanisms, such as revolving funds, property-linked finance and local green bonds Facilitate access to finance through local schemes or partnerships
 **Skills**	Increased funding for skills More comprehensive training programmes that incorporate practical experience and multi-trade skills More stringent standards and standardised training protocols Introduction of a builder licensing scheme and accreditation to address quality concerns Simplification of quality assurance frameworks, such as TrustMark and PAS 2035	Work with local training providers and contractors to encourage collaboration Allocate funding to enable contractors to take on apprentices and attend upskilling courses Carry out a scoping study with SMEs and sole traders to understand their training needs and barriers to upskilling Support local contractors in adherence to national accreditation schemes and quality assurance frameworks
 **Awareness and engagement**	Changes to the key terminology and narrative in promotional materials, replacing 'retrofit' with 'home energy improvements' and emphasising the impact these improvements would have on comfort instead of emissions reductions (this could also be done at local level)	Conduct research studies on market segmentation and public attitudes to retrofit Redouble efforts to provide clear and consistent information and advice to residents Target communication strategies and messaging to specific demographics Showcase best practice, innovative technologies and actions in council-owned properties using on-site visuals, case studies, client testimonials and digital tools Inspire action among individuals and communities by raising awareness of simple yet effective methods such as DIY draught proofing, and through appointing community champions and engaging with leaders through platforms such as CLCCG Collaborate with contractors and property agents to make retrofits more visible through standardised signage on properties being upgraded and highlighting energy efficiency ratings in property listings

Background on Cambridge City Leaders Climate Change Group and project origins

*The **Cambridge City Leaders Climate Change Group** was established in 2017 with the purpose of bringing together public and private organisations across Cambridge to explore how carbon emissions in the city can be reduced and collectively accelerate the decarbonisation of Cambridge. The group has successfully strengthened links between Cambridge-based organisations supportive of climate change mitigation, helping to identify opportunities for action.*

Through a series of workshops in 2023 and 2024, the Group identified five key thematic areas where they could collectively have the most impact. These include: (1) more clearly articulating and assessing the return on investment for renewable energy; (2) collating data on energy use and carbon emissions; (3) developing innovative partnerships for action; (4) ensuring multistakeholder holistic planning and (5) building retrofit at scale. The Group homed in on building retrofit at scale as a tangible opportunity.

The interest of the Group in building retrofit at scale and strong ambition from Cambridge City Council to scale action on retrofit, led to the commissioning of this report. The Group members own and operate residential and commercial buildings across the city, helping to accelerate and amplify action in this area.

The research informing this report focused on residential buildings, which is a priority area for the City Council and has the most significant impact on carbon emissions in the Greater Cambridge region.

Group members were invited to share sources to inform the literature review and to participate in the focus groups where applicable. They also came together in a workshop in June 2025 to feedback on the report's recommendations. Drawing on the Group members' inputs, the report identifies areas where the City Leaders Climate Change Group can support the Council in actioning some of the recommendations.

1. Introduction

*This report, and the research informing it, was commissioned by Cambridge City Council to **identify actionable strategies for scaling up energy efficiency and low carbon technology retrofits** across the Greater Cambridge area housing stock (encompassing Cambridge City and South Cambridgeshire). It aims to support the Council's commitment to achieving net zero carbon emissions by 2030 by providing practical recommendations grounded in local context, community engagement and sectoral expertise.*

Although the recommendations included in this report are aimed at the City Council, the background section and qualitative evidence collection also included South Cambridgeshire.

The residential building stock is responsible for around 12 per cent of the UK's total greenhouse gas emissions.[1] In Cambridge, domestic emissions (ie emissions from private homes and domestic car use) make up around 30 per cent of all greenhouse gas emissions, which is significantly above the national average. In South Cambridgeshire, this figure stands at 18 per cent, reflecting differences in population density, housing stock and levels of industrial and agricultural activity.[2] The majority of domestic building emissions come from energy consumption for heating, cooling, and power use for lights and appliances.[3] Cutting these emissions through decarbonisation of the housing stock is essential to meeting the UK's legally binding climate targets.[4]

Because around 80 per cent of the houses that will be around in 2050 have been built already,[5] reducing emissions from existing homes is crucial. This can be done through a practice called 'retrofitting', which is **the process of making improvements to one's home, so that it becomes more energy efficient in a way that reduces greenhouse gas emissions**. Retrofitting typically involves improving insulation of walls, floors and lofts, and upgrading windows and doors. It may also include upgrades to heating, hot water and lighting.[6]

With just under two-thirds of homes having an Energy Performance Certificate (EPC) rating of 'D' or below, **the UK has one of the oldest and leakiest housing stocks in Western Europe**.[†,7] These homes cost more to heat than they should, waste gas and burden the National Health Service (NHS). National estimates suggest that approximately 29 million homes across the UK need to be retrofitted with better insulation and electric heating technologies for space and water in the coming decades,[3] highlighting the immense scale of the challenge. If this figure is divided equally between now and 2050,[‡] more than one million retrofits would need to be delivered every year. **Current figures fall significantly short of this target**, indicating the need for annual retrofit activity at the national level to increase nearly tenfold.[8]

The retrofit challenge in Greater Cambridge is pressing.[9] Although recent and detailed data on energy efficiency in the area's 112,000 homes is not readily available, estimates suggest that the housing stock overall has an EPC rating similar or slightly above the national average (the national median stands at 68, which is the higher end of Band D[10]), indicating a considerable need for retrofitting.[10,11,12] **The area's retrofit potential is significant – but realising it requires a co-ordinated, well-resourced and locally tailored approach.**

Scaling up retrofits offers multiple co-benefits, which could improve wellbeing across the Greater Cambridge region. Beyond cutting carbon emissions, retrofits improve thermal comfort during winter and summer, making the building stock more resilient to extreme climate events. Positive health outcomes through

[†] It is worth noting that EPC rating limits (although not the system) vary between European countries, meaning that data is not directly comparable.

[‡] This approach is not aligned with the way the UK carbon budgets require the nation to frontload action. To deliver emissions reductions in line with the 2030, 2035 and 2040 emissions reduction targets, the UK would need to retrofit the vast majority of the building stock within the next 10–15 years to leave enough carbon budget for sectors where the technologies needed to decarbonise them are less developed, such as agriculture and some sectors of heavy industry.

improved indoor air quality and thermal comfort can bring significant benefits, especially for vulnerable residents such as children, older people and disabled people.[13,14] Energy efficiency retrofits can also result in lower fuel bills, reducing fuel poverty and increasing property values. Low carbon technology retrofits, such as heat pump installation, can further augment these benefits, especially when combined with solar photovoltaics (PV) and battery installation. When energy efficiency retrofits are targeted at low-income households, vulnerable households and households that live in fuel poverty, these measures can be effective in reducing inequalities in line with the 'just transition' principles. Retrofitting also presents substantial opportunities for job creation and economic growth, particularly in skilled trades and construction.[15]

However, scaling up retrofits across the different tenures and Greater Cambridge's diverse population and housing stock is not easy. Many of the key challenges in the Cambridge context are similar to those identified in other parts of the UK and elsewhere. First, high upfront costs present a barrier for many property owners, particularly those with lower incomes, insecure employment or high mortgage payments, and those who are not eligible for government subsidies. Second, the age, complexity and diversity of the housing stock necessitate tailored approaches and skilled expertise, which can be hindered by labour shortages and a lack of qualified professionals.[16] Specialised solutions, materials and planning permissions needed for complex property types, heritage listed properties and properties in conservation areas can slow down the process and increase costs.[17] Third, low consumer awareness and low engagement with retrofitting benefits and support schemes persist, leading to low take-up rates exacerbated by inconsistent government policy on retrofits. Accessing affordable financing and navigating complex and frequently changing incentive schemes can also be challenging, while the potential disruption and inconvenience during retrofitting deter owner-occupiers especially.[18]

In addition to the above, the Greater Cambridge region has some context-specific factors that influence the scaling up of retrofit activity. These include the age and characteristics of the building stock, tenure split and high level of income inequality.[12,19,20] Additionally, a large number of heritage listed properties, conservation areas and private rented houses present challenges, especially in Cambridge City.[12,21] However, above-average size of the private rented and social rented sectors could also be seen as an opportunity to facilitate more retrofits through regulation.

Although well-designed national-level schemes can deliver substantial progress[22] (for example, see the case study on Ireland in Section 4 of this report), approaching retrofitting at a local level can prove more effective and efficient in improving citizen engagement and aggregating bottom-up demand.[23] Co-ordinating retrofitting efforts at the local level can also lead to economies of scale through streamlining project delivery, leading to lower costs. Local authorities and community groups tend to have a deeper understanding than central government of the specific housing stock, resident needs and local challenges, allowing for more tailored solutions and targeted support. Therefore, ambitious and well-resourced councils can go 'further and faster' on energy efficiency retrofits, although the importance of a supportive national framework cannot be overstated.[24] The devolution agenda may further improve councils' ability to address these issues at the local level.[25]

This report seeks to support the City Council's efforts to scale up retrofits in Greater Cambridgeshire by exploring the factors that contribute to the currently low take-up of retrofits among property owners in the local context. It starts with a background section explaining why retrofits matter and who is involved in the various stages of the retrofit process (Section 2). Section 3 outlines the retrofit-related activities that are already ongoing in Cambridge City and South Cambridgeshire, as well as contextual factors that may influence retrofit activity in the region.

Sections 4–7 present the key findings thematically – focusing on policy and governance (Section 4), finance (Section 5), skills (Section 6) and awareness and engagement (Section 7). Each thematic section starts with an overview of the challenges at the national level, followed by analysis of the qualitative data collected from stakeholders in the Greater Cambridge context to provide a local perspective. The final segment of each section summarises the key learnings, concluding with a set of actionable recommendations for the City Council. These recommendations are split into suggestions for targeted advocacy at national level and actions that the Council could consider taking in the local context.

Section 8 of the report draws on the research and more detailed recommendations included in Sections 4–7, identifying a set of six 'priority actions' that we believe could be instrumental to scaling up retrofit activity in the region. Section 9 concludes, highlighting some of the lessons learned from this project.

The findings discussed in this report are based on focus groups and semi-structured interviews with local stakeholders, including housing associations, training providers, contractors and council staff, as well as a review of relevant local and national studies and policies. The research was undertaken between January and April 2025. For more detailed information on the research methodology, see Annex E. Due to budgetary constraints and the complexities of including two different segments of the buildings sector (see box below), the research informing this report focused exclusively on residential properties. However, some of the findings could be considered cross-cutting and supportive to overall building retrofit across the region.

Why we focused on residential property only: the differences between the residential and commercial retrofit landscapes

Ownership models and financing structures influence the adoption of energy efficiency and low carbon technology retrofits in the UK, leading to notable differences between residential and commercial buildings.

Buildings in the residential sector are typically owned by individuals or households, housing associations, local authority or small-scale investors. The ability and willingness to retrofit vary between the different ownership categories but are also influenced by personal and financial circumstances of the owner, levels of awareness, access to information and skilled workers, and contextual factors such as the neighbourhood effect. Commercial buildings, on the other hand, are typically owned by institutional investors or businesses, whose decisions around retrofitting are driven by return on investment (ROI), operational efficiency, and environmental, social and governance (ESG) targets. This creates a clearer business case and allows for more strategic planning. Commercial property owners also have better access to green finance tools, such as energy performance contracts and green loans, and benefit from the scale of their projects, which can attract private capital.

Policy and regulatory drivers also differ substantially between residential and commercial sectors. While there are some overlaps in policy and regulatory drivers between residential and commercial sectors, for instance Minimum Energy Efficiency Standards (MEES) requirements for rental properties, the majority differ substantially. Commercial buildings face stricter compliance requirements relating to MEES, as well as corporate sustainability reporting obligations, which often drive action. On the residential side, regulations like EPC ratings for buying, selling and renting property exist but are more difficult to enforce, particularly among owner-occupiers.

Additionally, while commercial retrofits can achieve cost-efficiencies through economies of scale, residential retrofits are often fragmented and costly to carry out, unless delivered through co-ordinated programmes such as community initiatives or social housing schemes.

2. Why retrofits matter and who needs to act

What are retrofits and why do they matter?

With just under two-thirds of homes scoring an EPC rating 'D' or below, the UK has one of the oldest and leakiest housing stocks in Western Europe.§ The environmental challenge associated with inefficient homes is exacerbated by 85 per cent of UK homes using natural gas for heating.[3] This figure is significantly higher than the EU average of 31 per cent, more than twice as high than in Germany (around 38 per cent) and three times higher than in France (around 28 per cent).[26] Heavy reliance on natural gas in residential properties means that the environmental benefits of a high penetration of renewables in the UK power sector has limited impact on residential emissions at the moment.[27,28]

Retrofitting of existing building stock is key to improving the quality of UK housing stock and achieving the country's interim emissions reduction targets and long-term objective of net zero by 2050. The term 'retrofit' is not widely used by the general public but is favoured by policymakers and industry to refer succinctly to various measures intended to reduce energy consumption and the use of fossil fuels. Retrofits include measures such as:

- **Insulation upgrades** through roof insulation, cavity wall insulation, floor insulation, external or internal solid wall insulation and high-performance glazing, such as replacing single-glazed windows with double- or triple-glazed ones. Insulation upgrades typically require ventilation system improvements as well to ensure good indoor air quality.
- **Replacing fossil fuel technologies with electric alternatives**, for example removing a traditional gas boiler and replacing it with an electric heat pump or a high heat retention storage heater to heat the home. Solar panels and battery storage units can also be added to enable households to produce some of their own power, reducing utility bills.
- **Reduction of energy use** through technologies such as smart sockets and heat recovery systems.

Retrofits can also include additional measures to improve the climate resilience of a home, such as the installation of external shutters to ensure the homes remain comfortable during the more intense and more frequent extreme weather events that are occurring as a result of climate change.[3] In some instances, retrofitting involves replacing old and inefficient electric heating systems with central heating, or installing central heating to homes that were previously heated using wood-burning stoves or portable electric panel heaters. Although other factors such as water use efficiency also impact homes' environmental footprint and should be subject to building regulations, the focus in this report was on retrofits that impact energy consumption and greenhouse gas (GHG) emissions.

Co-benefits of retrofits

Professionally delivered high-quality retrofits offer a compelling array of benefits that extend beyond simply reducing a home's carbon footprint. By improving the energy efficiency of existing buildings, retrofitting contributes to a more sustainable future while also enhancing the quality of life for the occupants.[29]

One of the most significant benefits is the potential for substantial **savings in terms of operating costs**.[30] By upgrading insulation, installing energy-efficient windows and doors, energy-efficient lighting, and implementing smart heating controls, homeowners can significantly reduce their energy consumption. This translates to lower energy bills, freeing up household budgets. High-efficiency clean heating options such as heat pumps, especially when combined with rooftop solar PVs and battery storage, can further reduce a household's energy bills and reliance on fossil fuels. When energy efficiency retrofits are targeted at low-income households, vulnerable households and households that live in fuel poverty, these measures can be effective in reducing inequalities in line with the 'just transition' principles.[31] This is particularly relevant in Cambridge City, which was identified in 2017 as the most unequal city in the UK.[32]

§ It is worth noting that EPC rating limits (although not the system) vary between European countries, meaning that data is not directly comparable.

Energy-efficient homes are becoming increasingly desirable in the housing market, potentially leading to **higher property values and quicker sales**. At the national level, Nationwide's recent research data shows that owner-occupier properties rated EPC A/B attract a 2.8 per cent price premium over similar EPC D-rated properties. The willingness to pay more for more energy-efficient houses is particularly pronounced in the Buy to Let sector, where EPC A/B homes attract a significant price premium of 11.5 per cent over EPC D-rated ones.[33] This may be linked to the UK government's intention to strengthen the Minimum Energy Efficiency Standards (MEES) for private sector rental properties by requiring them to achieve a minimum EPC rating of C (currently E) by 2030.[34] However, it is not yet known at the time of writing whether the requirements for EPC rating C will also be amended when new MEES come into effect. When the new requirement is implemented, landlords will need to improve the energy efficiency of their properties to continue letting them.

Beyond environmental benefits and financial gains at the household level, retrofitting can create a **healthier and more comfortable living and working environment**.[35] Improved insulation and ventilation systems reduce draughts, dampness and mould growth, which are known to exacerbate respiratory problems and allergies.[36] A well-insulated home also maintains a more stable temperature, reducing the risk of overheating in summer and ensuring a cozy warmth in winter. This enhanced thermal comfort contributes to improved wellbeing and reduces the likelihood of fuel poverty, where households struggle to afford adequate heating. Some low carbon electric solutions, such as bi-directional heat pumps which can be used to cool down indoor space, can also increase comfort in the summer.[37]

At household level, the indirect benefits from retrofits include lower stress levels from reduced pressure from bills, fewer sickness absences, better school performance and improved productivity. At national scale, the retrofit benefits translate into lower healthcare costs.[38] It has been estimated that retrofitting the UK's homes can provide almost £56 billion in health benefits, delivering substantial savings for the NHS.[3]

By **reducing energy demand and reliance on fossil fuels**, retrofitting helps to mitigate climate change and **improve air quality**. This contributes to a healthier environment for everyone, reducing the risks associated with pollution and extreme weather events.

Additionally, the retrofitting industry itself presents opportunities for **economic growth and job creation**, particularly in skilled trades and construction.[39] A report by the Institute for Public Policy Research (IPPR) estimates that retrofitting every home in the UK could create 1.2 million direct jobs and 1.5 million indirect jobs.[40]

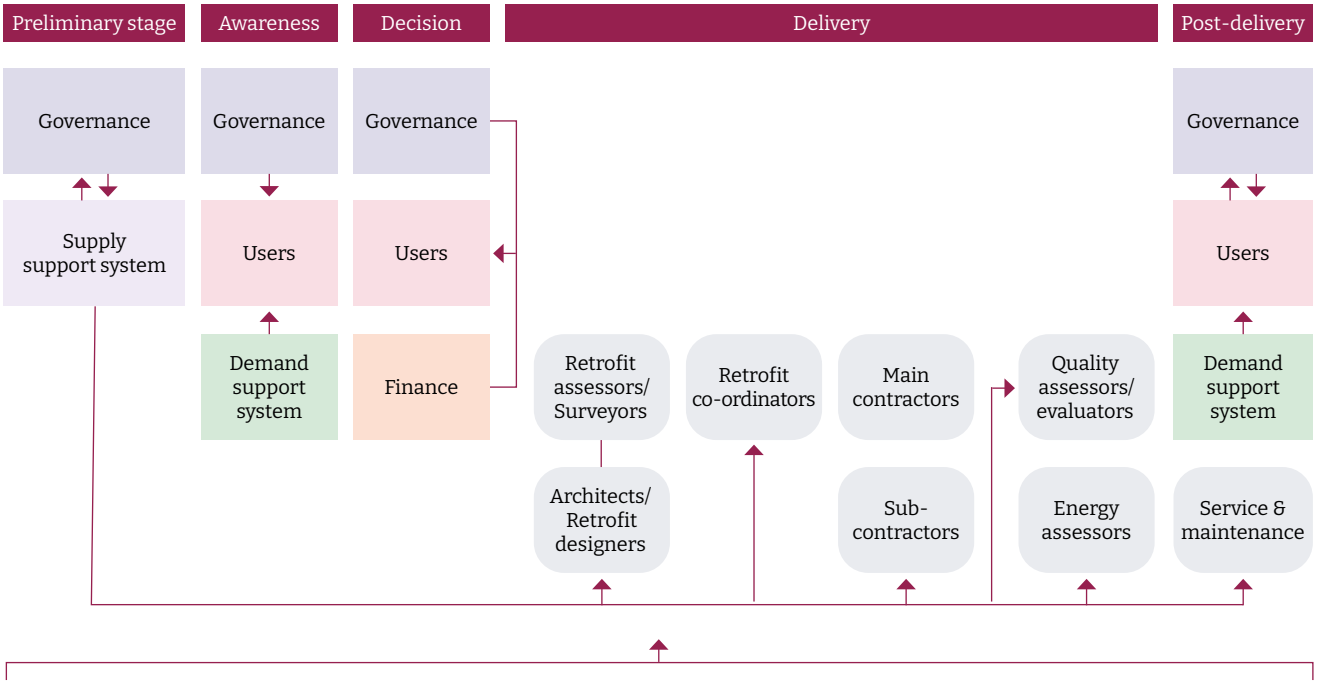
The retrofit ecosystem: who is involved and who needs to act?

The retrofit ecosystem is complex, involving various stakeholders whose engagement impacts various stages of the process. In Figure 1, these stakeholders are classified into 'categories' using colour-coding and mapped onto the five key stages of the retrofit process: (1) the preliminary stage; (2) awareness; (3) decision; (4) delivery and (5) post-delivery. Adding to the complexity of developing a retrofit ecosystem stakeholder map, each stakeholder category includes different 'types' of stakeholder. The 'governance' category also includes factors such as standards and certification schemes, which play an important role in the retrofit ecosystem.

Some of the stakeholder categories in Figure 1, such as governance and users, are involved in most of the retrofit process stages. Others, such as finance providers, influence primarily the decision stage of the process. In some instances, stakeholders influence each other. For example, governance – through different regulations, standards and certifications – influences the actions of the supply support system players in the preliminary stages and users in the awareness, decision and post-delivery stages.

Supply support system stakeholders play a fundamental role in the preliminary stages, with their actions impacting the availability of sufficient numbers of adequately skilled workers needed in the delivery and post-delivery stages. Demand support system stakeholders, on the other hand, influence the users in the awareness and post-delivery stages. During the delivery stages, users are also impacted by the disruption caused by the retrofit activity, but this is not captured in the map.

Figure 1: Key stakeholders mapped across the five stages of the retrofit process



Governance

Level

- National: DESNZ, MHCLG
- Regional, e.g Combined authority
- Local, e.g. city council

Regulation

- Minimum Energy Efficiency Standard
- EPC reform
- Planning regulation
- Warm Homes Plan

Standards, Certification & Accreditation

- PAS 2030 & PAS 2035 (TrustMark)
- Residential retrofit standard (RICS)
- Product/performance standards
- National Vocational Qualifications

Finance

Public

- Government grants and funding scheme e.g. Warm Homes Grant, SHDF, ECO4
- National Wealth Fund

Private

- Low/no interest loans e.g. Green Additional Borrowing

Users

Groups

- Housing Associations
- Local Authority Housing
- Community Energy groups

Individual

- Homeowners
- Private Landlords
- Tenants

Supply support system

Awareness

- Industry associations

Training

- Educational institutions
- Quality-scheme providers and training institutions (e.g. Elmhurst Energy, ECMK, Quidos, Sterling Accreditation)

Technology provision

- Manufacturers
- Distributors/Importers
- Energy companies
- Insurance companies

Demand support system

Awareness

- Media
- Retrofit advice providers
- Think tanks
- Property agencies

Impact

- Evaluator
- Energy companies

DESNZ: Department of Energy Security and Net Zero; MHCLG: Ministry of Housing, Communities and Local Government; RICS: Royal Institution of Chartered Surveyors, SDHF: Social Housing Decarbonisation Fund

3. Retrofitting in the Greater Cambridge context

Key objectives and current activities

Cambridge City Council and South Cambridgeshire Council are actively engaged in promoting and supporting retrofitting initiatives within their jurisdictions. In Cambridge City, the Council's activity around retrofit demonstrates its commitment to decarbonising its housing stock and achieving its ambitious net zero goals.

Both councils in the Greater Cambridge area are actively retrofitting their own stock to improve comfort and energy efficiency, reduce fuel poverty and eradicate unhealthy housing conditions. In 2019–23, the City Council carried out a programme of energy efficiency improvements to council homes with poor energy ratings and secured additional grant funding to help fund further retrofitting of council homes with solid walls. In 2024–29, it is planning to fit External Wall Insulation (EWI) to lift as many of the Council's residential properties as possible to at least EPC B and C.[41] It has also undertaken a pilot project to retrofit 50 council homes to a net zero carbon standard, showcasing the feasibility of deep energy retrofits in a real-world setting.[42] In South Cambridgeshire, the local council has undertaken a pilot retrofit project to make the district council offices in Cambourne carbon neutral.[43]

The councils have also incentivised and supported retrofit across the broader housing stock, including homes that are not owned by the Council or housing associations. Both councils are involved in the Action on Energy scheme[44] (see case study below), which provides information and guidance to all homeowners in the region on how to reduce energy consumption, the benefits of retrofits and how to access funding. The Action on Energy supplier framework seeks to make it easier for residents (and organisations) to find trusted contractors who can deliver retrofit works.[45] Both councils were also active in the Solar Together partnership,[46] which enabled homeowners to purchase high-quality solar panels at a competitive price through a group-buying scheme. In addition to the joint initiatives, Cambridge City Council has developed a comprehensive guide, which provides information about retrofit measures and costs for homeowners and tenants seeking to improve the energy efficiency of their properties.[47]

Comprehensive guides on retrofit in typical property types in the area are also planned in South Cambridgeshire, where the District Council reported significant insulation activity over the ten-year period between 2009 and 2019. This included 524 External Wall Insulation (EWI) installations, 3,628 Cavity Wall Insulation (CWI) installations, 4,187 loft insulation upgrades, 4,971 double/triple glazing installations and 295 air source heat pump installations.[41] Uptake of renewables, particularly solar PV, is high in South Cambridgeshire, with over 11,000 MCS-certified systems (82.8 per cent of all local MCS installations).[48]

As of September 2024, one in five households in South Cambridgeshire had an MCS-certified renewable energy installation. Air source heat pumps are the second most popular technology there, with more installed by September 2024 than in all of 2023. Comparable figures across the whole housing stock are not available for Cambridge City region.

Case study: Action on Energy Cambridgeshire

Action on Energy Cambridgeshire is a collaborative initiative bringing together Cambridgeshire County Council and local district councils (Cambridge City, East Cambridgeshire, Fenland, Huntingdonshire, and South Cambridgeshire) to provide residents with a central resource for improving home energy efficiency.[44] Its primary mission is to help create warmer homes, enable savings on energy bills and assist communities in reducing their carbon emissions. To achieve these goals, the partnership offers comprehensive advice on energy-saving measures, practical guidance, information on funding opportunities like Energy Company Obligation 4 (ECO4), the Home Upgrade Grant (HUG)/ Home Upgrade Grant 2, Boiler Upgrade Grant, the Great British Insulation Scheme, Warm Homes: Local Grant and Local Authority Delivery (LAD) schemes.[49] It also provides support in finding qualified installers.

What Action on Energy has achieved to date

Through its efforts, including partnerships, Action on Energy has directly supported initiatives such as retrofitting 131 homes for low-income families across Cambridgeshire with energy efficiency and clean heat measures.[50] It also provided wider home energy intervention support to an additional 232 Cambridge households in 2023/2024. The initiative serves a broad range of residents, including homeowners, landlords and tenants, with a significant focus on supporting low-income households and those off the mains gas grid to tackle fuel poverty.

Action on Energy benefits from sitting within broader strategic initiatives such as the Cambridgeshire Energy Retrofit Partnership (CERP), which enables it to form partnerships for delivery and installation and to secure large-scale government funding more effectively.[51] Residents across Cambridgeshire (and, for some schemes, Peterborough) can access information via the official Action on Energy website.

Recommendations to strengthen the initiative further

To strengthen the multi-council collaboration, several strategies could be beneficial. These include **strengthening community engagement by ensuring participatory decision-making and empowering local voices**, which can build trust and ensure projects meet genuine community needs. **Enhancing partnerships with local organisations, businesses and academic institutions** can bring in additional expertise, resources and innovative solutions, particularly in areas like research, technology deployment and reaching diverse community segments.

As funding schemes evolve – from earlier programmes like LAD and HUG to current and upcoming ones like HUG2 and the Warm Homes Fund – Action on Energy has an **important role in supporting stakeholders through these changes**. Furthermore, strengthening the collaboration could involve **establishing clear key performance indicators (KPIs) for shared environmental objectives** and **regularly monitoring progress** to allow for adaptation and continuous improvement.

Ensuring long-term sustainability can be supported by **transparent governance, open communication channels** among all partners and with the public, and **proactively seeking diverse and long-term funding sources**. **Investing in knowledge transfer** between partner councils and with external experts can also build collective capacity and drive innovation in delivering energy efficiency solutions. Finally, actively working to **simplify programme application processes** and **ensuring that support is easily accessible** can maximise resident participation and the overall impact of the initiative.

Scaling up retrofitting in the Greater Cambridge context

Despite ongoing activities and resources that are already made available by the councils, Cambridge City Council and South Cambridgeshire District Council could potentially do more to accelerate the pace of retrofitting and achieve their climate ambitions. The purpose of this report is to outline some actions, activities and strategies that the councils may be able to deploy to accelerate retrofit uptake in the area. To maximise the effectiveness of these interventions, they need to be designed to address certain **specificities of the Greater Cambridge context**.[52] These factors, detailed below, have been identified from the literature review and supplemented with analysis of the qualitative data collected during the research and discussed in Sections 4–7 of this report.

1. High housing costs:

Housing costs, and the share of net income needed to cover them, have a substantial impact on disposable income and the ability of households to allocate money to property improvements, including retrofits. The Greater Cambridge region experiences significant housing affordability challenges, with high rental costs and house prices relative to incomes.[12]

2. Atypical tenure split for the UK context:

The ownership structure of the housing stock significantly impacts the mechanisms available for encouraging or mandating retrofit interventions. Unlike in many other parts of the UK, social housing remains significant in Greater Cambridge. The local authorities directly manage approximately 12,500 rented properties, with other registered providers such as housing associations managing just under 12,000 homes.[2] Cambridge City Council, unlike many authorities nationally, still directly owns and manages a substantial housing stock, numbering 7,587 in April 2024 (excluding leasehold and shared ownership properties).[53] The share of owner-occupied housing compared to private rented is also unusually low. In 2011–21, owner occupation in Cambridge City declined from 47 per cent to 44 per cent (compared to 62 per cent in England).[12,54] The high proportion of private renting (official 2021 census data puts the number of households in private rented stock at 31 per cent but some private estimates go up to 42 per cent[55]) is a key characteristic of the city. Similar statistics for South Cambridgeshire are not readily available.

44%
owner occupation in Cambridge

compared to

62%
owner occupation in England

868
listed buildings in Cambridge

3. High proportion of older housing stock and heritage listed buildings:

Some types of building are more difficult, costly and risky to retrofit than others. Particularly in Cambridge city centre, many homes were built pre-1920s with solid walls, making retrofitting insulation more challenging and expensive. The region also has a high concentration of listed buildings and conservation areas. In Cambridge City, there are 868 listed buildings (of which 66 are Grade I, 52 Grade II* and 750 Grade II). The city also has 18 conservation areas covering over 20 per cent of its area.[56] While precise figures for South Cambridgeshire's listed buildings are not available, there are over 80 conservation areas across its villages, reflecting its more rural status. These designations impose restrictions on external modifications and other visible retrofitting measures, while acceptable retrofits often require planning permission, and specialist skills that come with a higher price tag.

18
conservation areas in Cambridge

Numbers correct as of date of publication.

30%+
of housing stock in private rented sector

4. University city with a transient population, which translates to rental market dominance:

A large proportion of housing stock (over 30 per cent) is in the private rented sector, with a lot of short-term tenancies to cater for the needs of students, researchers and professionals with a high degree of mobility. The prevalence of short-term tenancies in the private rented sector may translate to lower pressure on landlords to invest in energy efficiency improvements to incentivise tenants to stay for longer. At the same time, highly educated professionals tend to earn salaries that render their landlords ineligible for many government subsidies.

5. Rapid growth and development:

The city has grown in both population and size, which means there has been an increased focus on new-build homes. Significant new housing developments can provide more lucrative and lower-risk opportunities for skilled workers, and divert attention and resources away from retrofitting existing homes. Rapid growth can also put pressure on existing energy infrastructure, potentially hindering the adoption of heat pumps and other low carbon technologies.

6. Incidence of fuel poverty:

Cambridge is one of the most unequal cities in the UK. Despite having higher than average property prices and income levels, the incidence of fuel poverty is still considerable. Fuel poverty affects a notable number of households: 9 per cent (4,461 households) in Cambridge City and 8.7 per cent (4,442 households) in South Cambridgeshire according to National Energy Action data.[57] Other data suggests 9.8 per cent (6,411 households) in South Cambridgeshire[58] and 11 per cent in Cambridge City (2020/21).[55]

9%
households affected by fuel poverty in Cambridge City

8.7%
households affected by fuel poverty in South Cambridgeshire

19.6%
households off the gas grid in East of England

7. Off-gas grid properties:

While specific data for Greater Cambridge is hard to find, mains gas is the dominant heating fuel in England and Wales (73.8 per cent of households).[59] The East of England has a high proportion of homes off the gas grid (19.6 per cent in 2022), suggesting many in rural South Cambridgeshire rely on oil, liquefied petroleum gas (LPG) or electricity. Considering the volatility of oil prices, households currently using oil heating due to lack of gas grid connection could benefit substantially from heat pump installation.

While these high-level statistics provide an overview of Greater Cambridge from a retrofitting perspective, **mapping the specificities of the local context in greater detail could be key to driving a data-driven and evidence-based approach to retrofit at scale**. Using EPCs as a base metric for retrofit targeting may not be enough to guide the solution or to inform best engagement strategies. A study by Mora and Bardhan (2025) used Cambridge as a case study to develop a methodology for targeting mass retrofit.[60] Their approach integrates neighbourhood-level open data (land surface temperature, Index of Multiple Deprivation (IMD), fuel poverty rates, share of homes below EPC rating C, predominant building period or dwelling age) with building-level thermal imaging data. This study indicates that **combining area-level metrics with detailed information about the building stock could provide better insights than EPC rating alone to identify clusters and neighbourhoods primed for intervention**.

The structure of the thematic sections

The subsequent sections (Sections 4–7) of this report combine **evidence from existing literature** with **qualitative data** (collected from a series of interviews and focus groups with local stakeholders, see Annex E) from the Cambridgeshire local context. These thematic sections explore how policy and governance, finance, skills and awareness influence retrofit appetite and ability among property owners in the Greater Cambridge area.

Each thematic section starts with an overview of the challenges at the national level, followed by analysis of the qualitative data collected from stakeholders in the Greater Cambridge context. The final segments of each section summarise the key learnings, concluding with a set of actionable recommendations for the City Council. These recommendations are split into suggestions for targeted advocacy at national level and actions that the Council could consider taking in the local context.

Supporting the results and recommendations in Sections 4–7, Annex D draws on the research results and evidence from existing literature, outlining how Cambridge City Council could leverage systemic opportunities to scale retrofit activity through positive feedback loops.

4. Policy and governance

Systemic challenges at national level

At the national level, **policy instability and a lack of a comprehensive and holistic long-term retrofit strategy deter investment** in the retrofitting sector. This is in stark contrast with countries such as Ireland (see Appendix C for a country case study), as well as Germany, Sweden and Denmark, which have reduced the GHG emissions from their housing stock by between 10 and 20 per cent through retrofits. However, even these countries fall short of the International Energy Agency's (IEA) target retrofit rate of at least 2.5 per cent per annum by 2030.[61]

In the UK, frequent changes in government leadership and priorities have contributed to a sense of **uncertainty over long-term commitments to decarbonising the built environment**. The revolving door of ministers responsible for energy and climate policy has led to a lack of consistent direction and a perceived lack of commitment to sustained action, eroding consumer and business confidence. High levels of uncertainty deter producers and users alike from taking action until absolutely necessary, resulting in lower investment than may otherwise be the case. For example, in 2015, the UK government abandoned its near net zero buildings policies announced in 2006, including the planned revisions to Part L of the Building Regulations (which stipulated stricter energy efficiency standards).[62]

The lack of direction and commitment to long-term action is also reflected in frequent changes to funding schemes. Supportive funding mechanisms, such as the Green Deal Communities scheme, were established and extended before being suddenly cancelled, leaving consumers, businesses and local authorities to face a 'policy void' with little certainty of future direction or support. Another prominent example is the abrupt closure of the voucher element of the Green Homes Grant scheme in March 2021, just six months after its launch. This initiative, aimed at providing vouchers to homeowners for energy efficiency upgrades, was plagued by administrative issues, poor timing, short duration and lack of industry engagement during the planning stages, all of which contributed to its failure to deliver on its promises.[22] Its sudden cancellation left many homeowners and installers in limbo, eroding trust and discouraging future investment in retrofitting activities and skills development.[63]

Policy instability and lack of clear and coherent strategy have created a challenging environment for homeowners, businesses and local authorities, **hindering investment in skills, supply chains and innovation**. Among property owners, the lack of stable incentives dampens demand for retrofits. The stop–start nature of government schemes and incentives creates a volatile market, making it difficult for businesses to plan and commit to long-term growth. The construction industry, which is crucial for delivering retrofitting projects, requires a predictable pipeline of work to invest in skills and capacity. Similarly, product manufacturers must have enough confidence in growing demand to upscale their production and upskill workers.

Greater Cambridge local perspectives – findings from focus groups and interviews

Policy uncertainty and complex governance structures create significant barriers to scaling retrofit in Greater Cambridge, particularly among private sector landlords who control around a third of the area's homes. The constantly shifting policy landscape, with frequent changes to regulations and funding schemes, makes it difficult for homeowners and landlords to make informed decisions. As one participant noted, "We've had a decade of really very, very fragmented central government policy and funding." This inconsistency leads to a lack of confidence in long-term government support for retrofit initiatives and creates a sense of instability that discourages action.

Upcoming changes to Minimum Energy Efficiency Standards (MEES) and EPC ratings create anxiety for landlords. The changes to the MEES regulation are expected to increase the minimum EPC rating for private rental properties from E to C, requiring rental properties to meet higher energy efficiency standards. Amendments to the EPC ratings, on the other hand, will change what is required for a property to achieve EPC rating C. As one landlord stated, there is a lot of "anxiety" because current EPC ratings "may... be reduced considerably depending on the new rules." Currently, this uncertainty makes landlords in Greater

Cambridge hesitant to invest in retrofit measures because the requirements to achieve C rating may change, necessitating additional upgrades. As one landlord noted, "It's not something landlords want to invest in at the moment." We also found some letting agents actively discouraging landlords from undertaking energy efficiency improvements until it becomes clear what measures will enable them to meet the incoming energy efficiency criteria.

Landlords are also worried about **the cost of upgrading** properties to meet these new standards, with estimates ranging from £15,000 to £20,000 per property, a figure that was frequently referred to by the respondents as a "fortune". However, indicative but unpublished evidence collected during this research suggests that the actual cost of deep retrofits (to substantially improve a property's EPC rating) would likely be much higher, further hindering action.

Some of the respondents expressed concern that **new-build properties are adding to the retrofit challenge**, instead of being built to future-proof standards. One of the respondents expressed frustration about the lack of stricter building standards, suggesting the Council could work with the national government to ensure we are "not building more homes that will then need retrofitting". This long-term view highlights the need for policies to ensure that new-build properties adhere to high energy efficiency standards to avoid future retrofit burdens.

In the Greater Cambridge context where a lot of new development is taking place, respondents recommended that **MEES for new-build properties should be aligned with the incoming requirements for private rented properties** to make them appealing for private sector landlords. This is fundamentally important in areas such as Cambridge City with an economy that relies on a functional private rented sector, but also because private sector landlords play a crucial role in getting many property developments financed by committing to buy them 'off plan'. However, building standards are currently determined at the national level.

The complexity of planning processes, particularly in conservation areas and for heritage buildings, also deters retrofit projects. This challenge is particularly pronounced in the Greater Cambridge context and was brought up in several interviews and focus groups. Landlords, contractors, homeowners and housing association representatives find navigating the various regulations and obtaining necessary permissions time-consuming and burdensome. For example, requiring planning permission for straightforward, low-cost measures – such as double-glazed windows – that have minimal visual impact but significantly improve energy efficiency has been a source of considerable frustration. Heritage officers are sometimes seen to be prioritising the preservation of historic features over energy efficiency improvements. As one participant described the situation, there is "constant resistance" and a lack of dialogue, with heritage officers issuing what feels like a "monologue" rather than engaging in constructive discussion. This can lead to significant delays and increased costs, making retrofit projects less appealing. Although the local authority is already offering one-to-one support for owners of heritage listed properties who are interested in retrofits, the service is not free to access.

Local governance structures also contribute to the governance-related challenges in the Greater Cambridge context. One respondent noted how the granular complexities within local authorities, with unclear divisions of responsibility and a lack of streamlined processes, can hinder efficient delivery. Even among some council employees, there is a perceived lack of joined-up thinking and communication between different departments within the local councils, which can lead to conflicting advice and bureaucratic hurdles for those seeking to undertake retrofits.

Key learnings and actionable recommendations

The most important changes needed to unlock the full potential of retrofitting and drive significant progress towards decarbonising the UK's building stock will need to occur at the national level. A **clear, comprehensive and stable roadmap and regulatory framework are essential**.[64] By instilling confidence in the retrofit market, this roadmap would incentivise private investment in supply and demand, and enable the development of more efficient and scalable delivery models. It is also crucial to strengthen the building codes for new-build properties (to stop adding to the stock that needs to be retrofitted) and establish a reliable, effective EPC system. A revised EPC system designed to measure energy efficiency and heat loss rather than heating costs would make the information on energy efficiency more transparent, meaningful, comparable and easier to understand for consumers and financial service providers.

There is also a need to accelerate key policy decisions and regulatory actions. For example, bringing forward the decision on the role of hydrogen in heating from 2026 would provide much-needed clarity for the industry and consumers. Upgrading MEES for new-build properties, extending eligibility to the Warm Homes: Local Grant (WH:LG),[65] and publishing the amendments to MEES and EPC ratings as soon as possible would ensure that landlords contribute to the decarbonisation effort, while also improving living conditions for tenants.

Implementing the Statutory Instrument for the Clean Heat Market Mechanism would stimulate the manufacturing of heat pumps, a key technology for decarbonising heating.[66] However, this would not be sufficient without an electricity market reform to reduce the price gap between natural gas and electricity. Such reform is needed to make the running costs of electric retrofit technologies like heat pumps more attractive and cost effective for residents to accelerate the transition to electrified heating. Systemic change at national level is vital, as local action alone cannot overcome the current unfavourable operating costs of low carbon electric technologies for homeowners. While the price gap persists, the minimal savings from heat pump adoption continue to hinder uptake.

Drawing on existing literature and qualitative insights from the Greater Cambridge local context, we recommend that Cambridge City Council consider the following actions:

National-level advocacy:

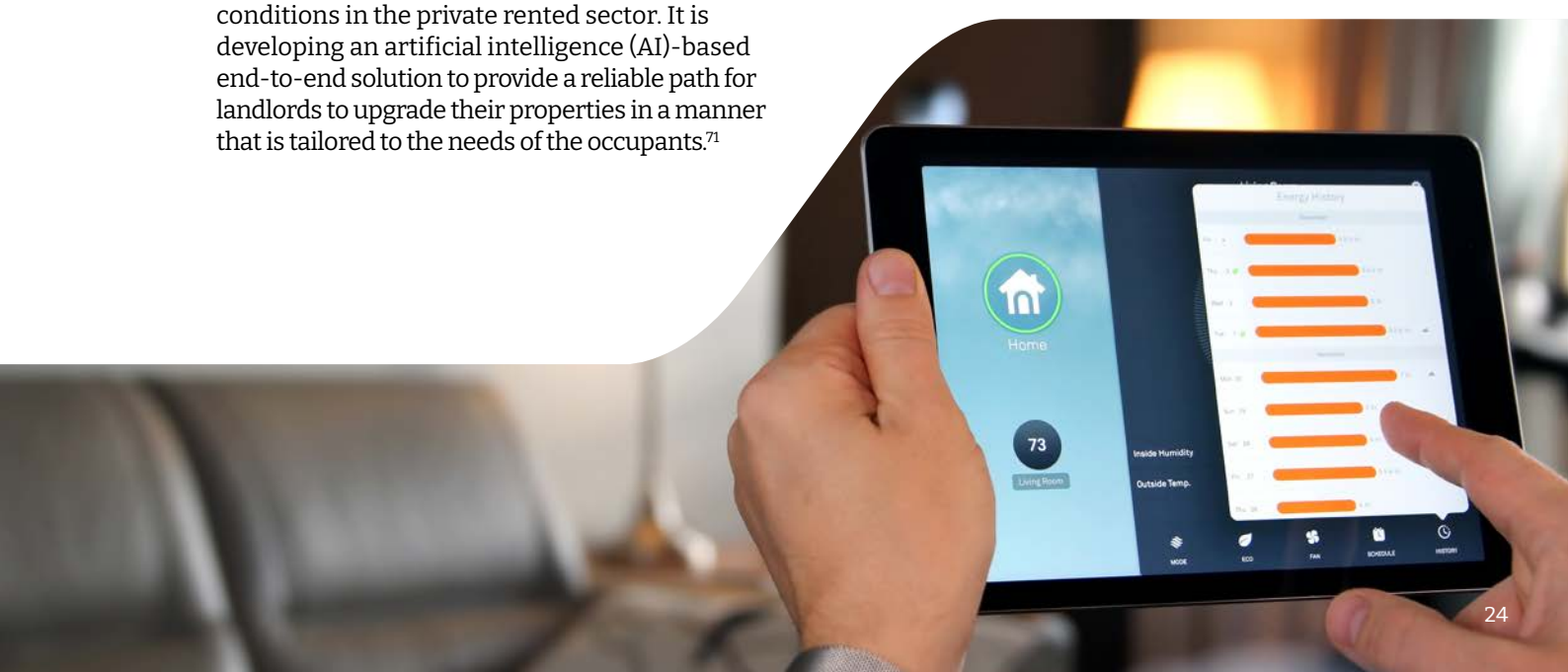
- Call for **stronger, more coherent and more stable national policies and regulations** to drive retrofit, including clear long-term targets and a supportive funding framework, stronger building codes for new-build properties and a more reliable, effective and fit-for-purpose EPC system.
- Call for the government to **extend the access to more grants to middle-income households and some private sector landlords**.
- **Advocate national-level long-term incentives for property owners to retrofit**, such as fiscal measures that reduce the amount of stamp duty payable on properties where the owners have undertaken energy efficiency improvements.[67]
- Advocate **greater local authority powers**, including:
  - ability to apply higher energy efficiency standards on new-build properties
  - flexibility to implement retrofit policies tailored to local needs
  - reforms to council tax and stamp duty to enable local authorities to use these systems to reward electric-only households and households that occupy energy-efficient properties.
- **Continue engaging with government consultations** and enquiries to provide evidence and shape national policy.
- Advocate **national electricity market reform**, pushing for changes that reduce the cost of electricity relative to gas, particularly by rebalancing environmental levies.

At the local level, the City Council could:

- **Develop a comprehensive local retrofit strategy with clear objectives, targets and timelines.** This strategy should be co-created with all relevant council departments and other stakeholder groups identified in the stakeholder map in Section 2 (Figure 1) and Annex E of this report. Different options for the best ways to develop this strategy could be explored with the City Leaders Climate Change Group (CLCCG). Once the strategy is in place, key staff in all local authority departments should be engaged in its implementation. The timeframe for actions should also be clarified.
- Streamline planning processes for retrofit projects and carry out **research to understand how planning regulations may prevent or slow down retrofits in heritage listed properties and properties in conservation areas.** The Council could consider revising some of the planning regulations that are within the powers of the local planning authority. Such revisions could

include a blanket approval for certain retrofit measures that have limited or minimal impact on the external appearance of the property, such as double glazing of windows, internal insulation or solar PV installation. For example, the Royal Borough of Kensington and Chelsea has recently introduced a Listed Building Consent Order, approving solar panels on most Grade II and Grade II* listed buildings without the need for individual application.[68] The Council could also explore opportunities to collaborate with academics to access research funding to explore new and scalable innovations for minimally invasive retrofits that could be rolled out in the city's heritage listed buildings.

- **Provide landlords with greater support and incentives** to undertake upgrades. Some options for this could include:
  - Revitalising the Council's existing landlords' forum to facilitate more effective information exchange between landlords and the Council, with regular catch-ups in person or online. To be effective, the Council may need to collaborate with major letting agents in the area to promote awareness of the landlords' forum and the potential benefits of participation to the landlords who get involved.
  - Holding discussions with private landlords to explore their needs and how the Council could support them with retrofit funding applications.
  - Supporting groups of private sector landlords in procuring services together, potentially through the Council's framework.
  - Exploring the possibility of setting up initiatives that target private sector landlords, such as **Let Zero**,[69] which is currently being trialled in the South Yorkshire Mayoral Combined Authority.[70] The idea behind Let Zero is to develop a model that helps local authorities, combined authorities and metro mayors to tackle poor housing conditions in the private rented sector. It is developing an artificial intelligence (AI)-based end-to-end solution to provide a reliable path for landlords to upgrade their properties in a manner that is tailored to the needs of the occupants.[71]
- **Strengthen and expand collaborative relationships** with local housing associations, the combined authority, other local authorities and national organisations to share best practice and resources and amplify the voice of local government on retrofit. Collaborative efforts and joint proposals, especially with local housing associations and nearby local authorities, could potentially be leveraged to improve access to funding and to secure skilled retrofitters who are disinclined to accept smaller projects. Research has documented that combined authorities are better placed for delivery:[72] illustrative programmes are already being implemented by the Greater London Authority,[73] Greater Manchester Authority[74] and East Midlands Authority[75] among others. The West Midlands Authority set up the Sustainable Market for Affordable Retrofit Technologies (SMART) hub, which attracted £10 million in funding and supported partners in bids of up to £14 million.[76] It has also launched its building retrofit pilot as part of its Trailblazer Devolution deal and garnered £167 million in funding. While Cambridge has laid the foundation for this work with the Cambridgeshire Energy Retrofit Partnership (CERP) and Action on Energy, this could be strengthened through more detailed plans and additional funding. (For more examples of local authority partnerships and community-led collaborative partnerships, see case study below and Annex A).
- If enabled after devolution: **consider implementing local building regulations to drive higher standards for new-builds** to ensure they do not add to the retrofit challenge.



Case study: A strong national policy with targeted local interventions - the case of Ireland

Ireland has been successful in accelerating domestic retrofit uptake through a powerful combination of **ambitious national policy**, **a dedicated delivery body** and **targeted local engagement**. The Irish example can provide instructive lessons for the UK and the Greater Cambridgeshire context.

Faced with an ageing housing stock and significant emissions from the residential sector, Ireland set ambitious retrofit targets in its 2021 Climate Action Plan in addition to developing a dedicated plan for the sector. The National Retrofit Plan sets ambitious targets to be achieved through a multi-faceted approach: 500,000 residential retrofits to a Building Energy Rating (BER) of B2 or higher; the installation of 400,000 heat pumps by 2030; and making energy efficiency upgrades more affordable.[77] The strong policy was backed by a solid financial commitment of **€8 billion to 2030**.[78] This long-term, substantial funding commitment provides crucial certainty for homeowners and, critically, for the supply chain to scale up.

Ireland's National Retrofit Plan set out to address not only the technical aspects of retrofitting but also the financial, social and logistical barriers that hinder uptake. It has instituted a **focus on 'one-stop shops'** to provide a single point of contact for information, advice, financing and access to qualified contractors.[79] Furthermore, Ireland has implemented **a robust medium-term grant scheme** that provides significant financial support for homeowners, covering a substantial portion of retrofitting costs (grants provide both partial and full support).[80] This has been crucial in driving demand.

The dedicated delivery body is the Sustainable Energy Authority of Ireland (SEAI). This central agency is empowered to:

- drive delivery of retrofit targets through various schemes
- promote uptake via marketing campaigns
- enhance the customer journey
- set standards for and register 'one-stop shops' (see below)
- increase the number of BER assessors and support the supply chain
- monitor and manage the quality and quantity of retrofit services.

One key factor of the policy and governance is the confluence between **national and local policy**.

The following actions have been critical to the scheme's success, and could potentially be replicated in the UK context:

1) Continuous funding for local authorities from various national pots: While SEAI leads national schemes, the Department of Housing, Local Government and Heritage provides significant funding for local authorities to undertake their own retrofit programmes, particularly for social housing. In 2022, €85 million was allocated to deliver 2,400 B2 (or equivalent) upgrades in local authority housing.[81] This empowers local councils to act as direct delivery agents for their own stock. In the same year, the Department of the Environment, Climate and Communications was also allocated €368 million – an increase of 17 per cent over 2021 – for Energy Transformation. This included €202 million from carbon tax revenue for residential and community retrofit schemes (over 22,000 home energy upgrades in total).[82]

2) Sustainable Energy Communities (SECs): SEAI actively supports the growth of community -led retrofitting initiatives by fostering local engagement and collective action. This builds on existing community networks and social capital, making retrofit less daunting and more economical through group projects. There are now over 1,000 registered SECs nationwide, promoting a 'collective impact' approach.[83]

3) Targeted outreach and normalising retrofit: SEAI recognises the importance of making retrofits visible and normative, and approaching it through a **'behavioural lens'**.[84] This includes:

- making retrofits more visible through standardised signage on properties being upgraded
- displaying salient labels on property listings to highlight energy efficiency
- hosting open home events to raise awareness and demonstrate benefits.

(Suggestions for how the Council can incorporate a similar strategy are discussed further in Section 7: Awareness and engagement).

4) Addressing the skills gap: Recognising that a robust supply chain is crucial, Ireland has invested in upskilling and training opportunities, including the establishment of industry **centres of retrofitting excellence** and even **mobile training units** to deliver education directly in communities.[85]

5. Finance

Systemic challenges at national level

Financial constraints present a major barrier to retrofits across the UK. Many households lack the upfront capital to invest in retrofitting measures, even with the promise of long-term savings. This is particularly acute for pensioners, low-income households and those facing fuel poverty. Even households that would be able and willing to pay for retrofits are reluctant to undertake them due to perceived lack of adequate support.[86] The government's 'able-to-pay' thresholds applied to various national funding schemes have also been criticised for being too low, resulting in calls to re-evaluate them.

The lack of financial resources among property owners can be compounded by conflicting priorities. Many homeowners have other financial commitments, such as childcare, healthcare and debt repayment (including mortgage), which take precedence over energy efficiency upgrades. High inflation in recent years, the cost-of-living crisis and the variability in mortgage rates have made it more difficult for households to commit capital and resources towards home improvements beyond urgent maintenance needs. Moreover, when home improvements are considered, many homeowners prioritise works that improve functionality or appearance, which also tend to be cheaper than comprehensive energy efficiency retrofits.

Current levels of funding and incentives are inadequate and unnecessarily complicated. The UK's retrofitting funding landscape is a complex web of schemes and grants, each with its own set of rules and requirements. This complexity makes it difficult for property owners to navigate and identify the best options that meet their needs, and for which they are eligible. Furthermore, the funding available is often insufficient to cover the full cost of retrofits that will generate significant savings or have a substantial impact on comfort levels, and the short-term nature of many schemes creates uncertainty for both homeowners and the industry. In many cases, funding schemes cannot be effectively used by the people who meet the income eligibility limits because they cannot fund part of the costs.

Funding schemes frequently miss the mark in terms of targeting. Low uptake levels indicate that many of these schemes have so far failed to effectively reach low-income households and those in fuel poverty, who need support the most.[7] At the same time, the strict income limits mean that the schemes fail to incentivise those who could afford to cover part of the retrofit costs but lack awareness or motivation. In some instances, excluding private sector landlords adversely impacts tenants, perpetuating inequalities.

Debt finance alone is not very attractive to property owners to cover retrofit costs, and low-cost financing alone can achieve very little if awareness remains low. For example, an evaluation of 0 per cent interest green additional borrowing provided by Nationwide indicates that the availability of finance has limited effectiveness in driving new demand for retrofit because the public believe responsibility for funding should lie primarily with the government.[33]

The overall level of funding for retrofits is insufficient. According to estimates from the Climate Change Committee (CCC), approximately £315 billion in funding is required to achieve the necessary upgrades and a significant portion of this funding must be publicly sourced. The Warm Homes Plan, the Warm Homes: Local Grant (WH:LG) and Energy Company Obligation 4 (ECO4) are steps in the right direction, but do not deliver the level of resources that are needed. Moreover, to be successful, these schemes would need to provide consistent, long-term, stable funding targeting users who are able to make efficient use of the grants, alongside a robust local delivery model. Easily accessible information regarding eligibility criteria that is available without people needing to share their personal details could also encourage more people to explore different funding options.[87]

Greater Cambridge local perspectives – findings from focus groups and interviews

Financial barriers are a major impediment to retrofit adoption in Greater Cambridge. The exceptionally high house prices in the region translate into high mortgage payments for property owners who have a mortgage, making retrofit financially unviable for a large segment of the population, including those who are considered 'able to pay' by national standards.

As one participant pointed out, for many, the cost of retrofit assessments alone is "a disproportionate barrier". This initial cost is a key access barrier, especially for owner-occupiers who might be eligible for subsidies but do not have a high disposable income, such as retired households that are 'asset rich but income poor'. However, these households may also be unable to take advantage of funding schemes that only cover part of the costs.

Poor affordability presents a barrier to retrofits also in the private rented sector, where the **income criteria for grant schemes are set too low for the Cambridge context**, excluding many from accessing much-needed support. The high rents in Cambridge mean that those who meet the income requirements used by letting agents to calculate ability to pay the rent are rarely eligible for the government subsidies. As one agent stated, "£39,000 joint income is not a lot at all and that certainly wouldn't get you much in the Cambridge market as a tenant." This highlights a mismatch between national funding schemes and the economic realities of Greater Cambridge.

Private sector landlords also express concerns about the **financial viability of retrofit from a business perspective**. Retrofits often incur substantial upfront costs to the landlords, but the benefits accrue largely to the tenants. Although some landlords acknowledge that property improvements may incentivise tenants to stay longer, this has limited value in areas such as Cambridge City with high population turnover and a tight rental market where demand exceeds supply and properties do not stay unoccupied for long. Moreover, the already high rents in Cambridge make it difficult for landlords to charge a rent premium for a more energy-efficient property. This challenge has been augmented by the removal of many previously available fiscal benefits to landlords since 2007. The combination of the absence of fiscal incentives and limited access to subsidies leaves many Cambridge landlords unable or reluctant to retrofit their properties beyond the minimum standards required by MEES.

Many of the **landlords also feel that they are being asked to shoulder a disproportionate financial burden compared to owner-occupiers** who face fewer obligations and enjoy better access to financial support. Although landlords are eligible for some subsidies under schemes such as ECO4, the Home Upgrade Grant (HUG), and Warm Homes: Local Grant (WH:LG), it is not uncommon for more stringent eligibility criteria to be applied to rental properties than owner-occupied. For example, income-based eligibility criteria for WH:LG applies to all tenants but not all owner-occupiers[65] Landlords are also required to cover 50 per cent of the costs, a requirement that is not applied to owner-occupiers.

The availability of debt finance for retrofit is another key concern. Most respondents mentioned that they would consider debt only to top up a subsidy, rather than to cover the entire cost of retrofits. Overall, awareness of available financial products, such as low-interest loans or green mortgages, was low among the focus group participants. Although some participants suggested that local authorities could play a role in facilitating access to financial products, many were reluctant to consider debt financing to top up government grants that may be discontinued before the work is finished, with some recalling the failures of past schemes like the Green Deal. The volatility of the housing market and rising interest rates also contributed to the respondents' hesitation to invest in expensive retrofit projects. As one participant put it, "people don't want to take out loans for these things".

Key learnings and actionable recommendations

At the national level, **the UK needs a funding system that is streamlined, stable and easy to navigate**, providing **full cost coverage to those most in need and partial cost coverage for those able to contribute**. There is a need to increase overall investment, direct different types of support more effectively to suitable target groups, and offer better assistance to households that can contribute but currently fall outside most subsidy schemes. Achieving this requires simplifying application processes, improving the clarity of available information, and ensuring that funding reaches those facing the highest financial and technical barriers to retrofitting. The UK government should also consider granting local authorities more autonomy over how different funds are used and distributed, as current 'one-size-fits-all' rules designed in Westminster can be a significant barrier to effective action in areas that differ from the national norm, such as Greater Cambridge.

High house prices and rents present a major challenge to retrofit in Cambridge. Interest in retrofit is also hindered by the perceived complexity and risk associated with financing retrofit projects, lack of clear information on available options, and lack of clear return on investment. Among landlords, the lack of regulatory certainty further discourages investment.

Drawing on existing literature and qualitative insights from the Greater Cambridge local context, we recommend that Cambridge City Council consider the following actions:

National-level advocacy:

- Call for **increased funding** for retrofit programmes, with **simplified application processes**, **flexible income limits**, improved clarity of information and **greater decision-making capacity for local authorities** in the allocation of the funds.
- Advocate **reinstatement of tax incentives for private landlords to undertake property improvements**, including heat pump installation and energy efficiency upgrades. Considering the large size of the private rented sector in Cambridge, increasing the incentives and removing the disincentives for landlords to undertake retrofits could help vitalise the retrofit market in the area by creating a stable stream of demand.

At the local level, the City Council could:

- **Facilitate access to national funding** by providing grant application support for private sector landlords, housing associations and owner-occupiers. **A weekly 'clinic'** where people can come to have a chat and receive information about funding options may work, at least in Cambridge City.
- **Explore innovative financing mechanisms**, such as revolving funds, Lendology, property-linked finance and local green bonds, to overcome financial barriers for property owners (see the case study on page 29 and Annex B for examples). This exploratory work could be facilitated through the City Leaders Climate Change Group (CLCCG). Options such as **property-linked finance** may be particularly suitable for older owner-occupiers who are asset rich but have low incomes. The Council could also **work with banks** to be able to provide information about private sector finance to interested parties.
- **Facilitate access to finance through local schemes or partnerships.** One option could be to **collaborate with renewable energy project developers** in the area, encouraging them to set up community funds, which could provide an additional source of finance for people affected by these projects. Some **examples of community funds** and how they have been deployed in the UK are available from the Nature Conservancy.[88]

Case study: Lendology

Lendology CIC, a Community Development Finance Institution (CDFI), offers a model for accelerating home retrofit through innovative financial solutions, primarily by partnering with local authorities. Operating as a B Corp social enterprise, Lendology prioritises social impact by providing fair, accessible and flexible low-interest personal loans for home improvements and energy efficiency upgrades. A key differentiator is its 'people-first' lending philosophy, which involves holistic assessments rather than solely relying on credit scores, ensuring broader access to finance for individuals often overlooked by mainstream lenders. This model transforms public funds into a recyclable loan fund, where initial council capital (minimum £300,000 annually) is re-lent as repayments are made, creating a sustainable, revolving investment for continuous retrofit support.

This approach yields significant social and economic returns. For every £1 invested by councils, Lendology generates a social value of £2.71, with an average social return of £29,247 per customer. Post-loan, 89 per cent of customers reported improved energy efficiency in their properties, and 96 per cent noted a positive impact on their health and wellbeing. The model effectively addresses market gaps by providing flexible loans with fixed 4 per cent interest rates and no early repayment charges, catering to diverse needs including energy efficiency, renewable energy and adaptations for independent living.

Recommendations:

Cambridge City Council can learn valuable lessons from Lendology's success.

- **Leveraging council funds for a sustainable and accessible scheme:** Given the estimated £4.65 billion cost to retrofit privately owned homes (to a net zero standard) in Cambridge, adopting a similar model could bridge significant funding gaps by leveraging council funds into a sustainable, revolving loan scheme. This shifts from one-off grants to continuous investment, providing greater stability for retrofit service providers.
- **Integrating with existing support and advice:** Lendology has developed a Good Home Hub concept which provides a comprehensive 'one-stop-shop' for residents, addressing their uncertainty about where to start and which measures suit their properties. Therefore, there is scope to integrate the Lendology approach with existing initiatives such as Action on Energy or Retrofit Hub.
- **Addressing financial exclusion and diverse needs:** By partnering with a CDFI like Lendology, Cambridge City Council could help provide more equitable access to retrofits, including those who are typically excluded from mainstream credit or have limited incomes. This aligns with Cambridge's broader goals of reducing fuel poverty and improving health outcomes within its community. The flexible loan products offered by Lendology, such as Interest Only or Interest Roll-up options, cater to a wider demographic.
- **De-risking local authority investment:** Lendology's status as a Financial Conduct Authority (FCA)-regulated lender, its B Corp social enterprise designation, and the use of Title Restrictions on loans provide robust safeguards for council funds. This offers a proven, low-risk model for Cambridge to prudently invest in the decarbonisation of its housing stock while delivering social and environmental returns.

6. Skills

Systemic challenges at national level

The ambition to retrofit the UK's housing stock relies on training workers to take on critical roles across a multitude of trades and professions. While estimates of the exact size and nature of the skills gap vary, there is a strong consensus on this deficit being substantial. For example, the Green Jobs Taskforce estimates that 230,000 more workers will need to be trained in retrofit by 2030. Other analyses suggest that over 400,000 builders and skilled retrofit professionals are required, compared to an estimated 200,000 currently working on home maintenance and upgrades.[89] The UK's Climate Change Committee (CCC) has projected a need for over 250,000 additional workers.[90]

Specific roles where shortages have been identified include:

- **Retrofit co-ordinators:** These professionals are essential for designing, managing and ensuring the quality and compliance of retrofit projects, particularly under the PAS 2035 (British retrofit standard) framework. Current estimates suggest there are fewer than 1,000 qualified retrofit co-ordinators, with demand expected to reach 50,000 by 2030.[89]
- **Heat pump installers:** At the time of writing, only around 3,000 engineers have been trained to install heat pumps, representing less than 5 per cent of the total plumbing and heating workforce.[89] With a government target of 600,000 heat pump installations per year by 2028, a tenfold acceleration in current installation rates is needed within the next four years.
- **Insulation installers and general construction tradespeople:** While not always quantified separately, many contractors working in construction and building trades (including plasterers, roofers, window fitters) could benefit from being upskilled on energy efficiency measures, building physics and moisture risk management.[91] Some contractors who do not deliver retrofits themselves could also be upskilled to provide information on retrofits to clients who hire them to do other home improvements.

The skills shortage is aggravated by **a lack of well-defined career pathways and consistent demand**.[89] A report by the Construction Industry Training Board (CITB) and TrustMark notes the urgent need to "build careers into the skills debate" to ensure long-term delivery and job creation.[92] They highlight that the vast majority of firms involved in retrofit are small to medium-sized enterprises (SMEs) (92 per cent with fewer than 50 employees). These smaller businesses often lack the resources and certainty of a consistent pipeline of oncoming work to invest in formal career development, new staff or continuous professional development for their employees.

Beyond skills, **the lack of standardised approaches, quality assurance frameworks and consumer protection measures** can undermine trust and confidence in the retrofitting industry.[93] A recent report by the Energy Security and Net Zero Committee suggests that poorly designed retrofit schemes, a skills crisis and costly assurance failures have set back efforts to improve energy efficiency and decarbonise home heating.[94] Nationwide attention to litigation and suspension of insulation installers due to 'botched' insulation jobs have contributed to this trust deficit.[95] The recent updating of the PAS 2035[96] and tighter monitoring under TrustMark (the only government-approved quality scheme and certification) seek to address these issues and improve the situation.[97] However, it will take more sustained engagement to build up consumer trust, as many lack information regarding these schemes and how they translate into practice. In the current landscape, adherence/compliance with the standard also adds cost and complexity to retrofit projects, increasing administrative burden for stakeholders and costs to consumers. However, these measures are essential to prevent more low-quality retrofits from further diminishing property owners' interest in retrofits.

There is an urgent need to allocate more resources at all levels of governance and across various government departments to build up a highly skilled and qualified workforce, including people who develop standards, people who enforce them and people who deliver the work. It will be through showcasing and sharing positive examples and stories that consumer confidence in retrofits and the professionalism of the contractors who deliver these services can be restored.

Greater Cambridge local perspectives – findings from focus groups and interviews

A critical barrier to scaling retrofit in Greater Cambridge is the **shortage of adequately skilled workers** across the sector. This shortage encompasses a range of roles, from assessors and co-ordinators to installers, tradespeople and project managers, all essential for delivering high-quality retrofit projects. The shortage is not as much in the number of workers, as it is in the **level of expertise, experience and confidence** among these workers. This is a challenge that was raised by respondents who had been through some of the training programmes, as well as their prospective clients, reflecting the national-level challenges detailed in the preceding section.

While specific data particular to a retrofit-related skills shortage in Greater Cambridge is not available, it has been recognised as a barrier to decarbonisation within Greater Cambridge. *The Infrastructure Gap: The future of sustainable energy in Greater Cambridge* by Cambridge Ahead explicitly identifies skills shortage as a factor threatening the region's capacity to support inclusive growth, develop renewable energy, and achieve an equitable transition to a net zero economy.[98] The report advocates prioritising "local participation, tailored skills development, and innovative ownership models" to ensure the benefits of the green transition are shared widely.

The **lack of promotion of retrofit as a desirable and valuable career path** contributes to the shortage of adequately skilled retrofit professionals, particularly among younger generations who may be drawn to more visible or tech-oriented professions. As one participant pointed out, "Kids can't leave school and go and become an insulation operative. They couldn't go to the careers office and say, well, I want to leave and do insulation." The absence of well-defined vocational training and apprenticeship programmes tailored to the specific needs of retrofit hinders the entry of new talent and the development of specialised skills. The focus on academic qualifications over practical experience in some training routes was also mentioned as a concern.

Another factor contributing to the skills shortage is a **widespread concern about quality assurance and training course duration**, which leads to discrepancies in competence and qualifications among those working in the industry. The qualitative data collected during this research suggests that "you get very different levels of skill for people that are supposed to be qualified to the same standard". Some respondents expressed concerns that there may be a gap between qualifications and real-world competence. The respondent implied that short-duration training programmes, although more accessible for sole traders and many other contractors, seem to be more focused on increasing the number of workers who are skilled on paper than ensuring that all those who possess certain qualifications have enough hands-on experience and confidence to deliver to the standards required for effective retrofit. As one participant noted, "Once you've done the training... you won't necessarily have the skill set to deliver successfully as a retrofit co-ordinator."

Inconsistency in quality can undermine confidence in retrofit and lead to a reluctance to invest, as homeowners and landlords fear poor workmanship or inadequate results. This challenge, if not addressed, may contribute to a 'bad reputation' of retrofits, while doing little to improve the supply of workers who are able, willing and confident to deliver retrofits. It also means that many workers who have been through the training remain reluctant to undertake retrofits, which are more difficult to 'get right' than aesthetic property upgrades, but the higher risk is not reflected in the financial remuneration.

There is a **need for more rigorous accreditation and ongoing professional development within the sector**. To an extent, this is already being addressed by the recent updating of the PAS 2035[93] and operationalisation of TrustMark. However, the concerns about the quality and standards within the retrofit skills supply chain translate into reluctance among contractors and landlords to work with people they do not know personally, or who do not come highly recommended by a personal contact. In the focus groups and interviews, several participants expressed a preference for using contractors and suppliers they have long-standing relationships with, indicating a lack of trust in newer or less established providers. As a result, it can be difficult for new entrants in the sector to find good job opportunities and start establishing a good reputation, unless they can receive hands-on training with reputable contractors with large client bases through an apprenticeship. Connecting new entrants with established contractors could also help address the ageing workforce, a challenge worsened by high housing costs that make Greater Cambridge unaffordable for many young people in manual trades.

The **nature of funding for retrofits** also plays a significant role. Short-term, project-based funding creates instability, which makes it difficult for businesses to invest in long-term training and for individuals to pursue sustainable careers in retrofit. As one participant noted in relation to how demand drives supply, "A more stable long term funding environment [for demand] would allow us to grow the retrofit provision steadily." Contractors are less likely to take on apprentices or invest in upskilling their workforce if they cannot guarantee a steady pipeline of work. This creates a vicious cycle, where the lack of skilled workers limits the industry's capacity to deliver retrofit projects, which in turn discourages further investment in training and skills development. If not mitigated through interventions that provide access to entry pathways and appealing career development opportunities for people from the local area, this may eventually lead to an ageing workforce of contractors, especially in areas such as Cambridge where the cost of living is above the national average.

There are also concerns about **the capacity of the supply chain to handle a significant increase in retrofit activity**. Participants stressed that "we need to upscale everybody, not just the delivery network". This includes manufacturers, distributors and other actors involved in providing the necessary materials and equipment for retrofit projects, as well as those who manage large retrofit projects, measure outcomes and enforce quality controls. A lack of investment in scaling up the supply chain could lead to bottlenecks and price increases, hindering widespread adoption of retrofit and further increasing concerns among users that retrofit professionals may not be able to deliver within the (often short) funding programme periods.

Key learnings and actionable recommendations

The research findings indicate that the quality of retrofit training programmes is as, if not more, important than the number of people being trained. It is crucial that all training programmes equip the participants with the necessary practical skills and confidence to undertake retrofits. This includes using the latest technologies for retrofits and retrofit impact assessments, indicating a need for ongoing 'tech upskilling' courses for certified professionals.

At the moment, many people who complete short-duration training courses lack the practical skills and confidence needed for retrofit. Instead of easing labour shortages, insufficiently trained workers may contribute to the negative perception of retrofits, which makes owners disinclined to have such work done on their property. Installations going wrong have already resulted in high-publicity court cases, which adversely impact people's willingness to consider them. However, it is important to emphasise that the shortcomings of some training programmes do not mean that all retrofit training is unfit for purpose. Rather, it indicates a need for more comprehensive impact assessments of different training approaches and methods to develop a strong evidence base to further improve the quality of the training programmes in the future.

Drawing on existing literature and qualitative insights from the Greater Cambridge local context, we recommend that Cambridge City Council consider the following actions:

National-level advocacy:

- Advocate **increased funding and faster deployment for regional skills hubs**.
- Advocate more comprehensive training programmes with stringent standards and standardised training protocols. All training should include practical skills and hands-on experience, and provide opportunities to embark on clearly defined career pathways on completion. Emphasising multi-trade skills

for whole-house retrofits could also enhance the effectiveness of training programmes (as demonstrated by the case study on B4Box below).

- Introduce a builder licensing scheme and accreditation process to address deficit of trust in retrofit providers.
- Simplify quality assurance frameworks such as TrustMark and PAS 2035 to make them easier to implement, without compromising quality.

At the local level, the City Council could:

- **Work with local training providers and contractors to encourage collaboration and closer working relationships** between the two. Closer collaboration between these stakeholders would allow trainees to acquire more hands-on experience and improve access to employment on completion. If possible, the Council could **allocate funding to enable contractors to take on apprentices** and attend **upskilling courses at regular intervals**. Upskilling courses would ideally cover amendments to standards, new mechanisms to cost-effectively integrate them into project delivery, the use of new technologies for retrofits and the assessment of their effectiveness. These training programmes could also have a social value focus by recruiting people from underprivileged backgrounds (for example, see case study below), enabling council funding to address skills shortages as well as socio-economic inequalities.
- Carry out **a scoping study with SMEs and sole traders** to understand their training needs and constraints. **Communicate the research findings to training providers** and collaborate with them to **develop suitable solutions**. For example, if SMEs and sole traders struggle to release capacity for one person to attend a three-month training course, pooling resources with other SMEs and allocating apprentices who have already completed the training to short-staffed SMEs may help to address this challenge. Small companies could receive two apprentices when they send one employee for retrofit training.
- **Support local contractors** in adherence to national accreditation and quality assurance frameworks to mitigate the administrative burden on them.
- **Encourage knowledge and skills sharing within and across projects and among contractors.** For example, the contractors who carried out the CISL Entopia Building retrofit[99] enhanced their knowledge and skills through the process. This has led to further work and opportunities for the contractors to apply their learning to other projects.

Case study: An integrated and collaborative approach to skills development

B4Box represents a novel approach to skills development within the UK's retrofit ecosystem through its integrated approach to training and employment. Operating simultaneously as a construction company and a college, B4Box focuses on delivering high-quality, low carbon construction services, primarily in areas affected by fuel poverty. Their unique model combines multi-trade skills training (such as joinery, plastering, tiling and roofing) with a guarantee of employment. Trainees are paid a monthly salary from day one, receive classroom instruction in the mornings, and then apply their learning on live retrofit projects in the afternoons. This 'on-site college' approach ensures that apprentices gain hands-on experience and comprehensive understanding of the varied requirements of 'whole-house' retrofit in real homes, equipping them with practical expertise while simultaneously improving local housing stock. B4Box specifically recruits local people, often from disadvantaged backgrounds including ex-offenders and care leavers, who typically face significant barriers in accessing employment.

The B4Box integrated model, exemplified in partnerships with social landlords like Stockport Homes Group, demonstrates a powerful way to address the skills shortage in the green building sector and to ensure that those who enter the industry possess sufficient skills and confidence to deliver retrofits. By linking training directly to a secure pipeline of work, B4Box overcomes common challenges in the construction industry, such as the preference for already experienced workers over new entrants. Their ability to deliver up to 90 per cent of a whole-house retrofit project with a small team of staff and apprentices significantly cuts costs and time compared to the traditional approach of hiring several specialised contractors. Furthermore, B4Box's commitment to training individuals living within a five-mile radius of their construction sites ensures that the benefits of skills development are directly felt within local communities, fostering social value and economic inclusion alongside housing stock improvements.

Recommendations:

- The **integration of training with guaranteed, paid employment** on live projects is crucial for attracting and retaining individuals. Cambridge could explore partnerships with local construction companies or housing associations to establish similar 'earn-and-learn' models. One such project could be set up specifically to train people in retrofitting heritage listed buildings.
- The emphasis on **multi-trade skills for 'whole-house' retrofit** is beneficial. Instead of focusing on single specialisms, training a workforce with a broader understanding of building fabric, insulation, ventilation and low carbon technologies will be more effective for comprehensive retrofit projects.
- The councils could emulate B4Box's strong **social value focus** by actively recruiting individuals facing employment barriers within the Cambridge area, thereby addressing both skills gaps and local socio-economic challenges, such as high levels of inequality.

7. Awareness and engagement

Systemic challenges at national level

Lack of awareness among property owners presents a challenge to retrofit scale-up at national level. Many homeowners remain unaware of the benefits of retrofitting, including potential cost savings, health improvements and increased property value.[100] Even when property owners are aware of the retrofit benefits, they may lack knowledge of different financing options or the motivation to undertake retrofitting projects, which are largely perceived as complex, disruptive and time-consuming. Inertia and a preference for the status quo can be powerful deterrents. The fragmentation of the retrofitting landscape – with homeowners needing to navigate a complex web of different providers for assessments, financing and installation – contributes to this challenge.

Another major obstacle to widespread retrofitting in the UK is the **disconnect between how initiatives are designed and how homeowners perceive the benefits**. Many programmes focus their communication on the broader societal and environmental benefits of retrofitting, such as reducing carbon emissions and combatting climate change. However, research shows that homeowners are primarily motivated by factors that directly impact their wallets and wellbeing, namely cost savings and improved comfort within their homes.[33]

A recent study on retrofit-related information provision in the UK found that **accessing appropriate information is still a significant barrier**, even for engaged and otherwise knowledgeable homeowners. The study identified challenges with "information overload, a lack of context-specific information and a lack of in-person engagement". One of its key conclusions was that the nature, framing and delivery of information all matter, and most people wish to receive **information from "trustworthy, local ... sources"**.[100] Timing may also play a role: it has been suggested that retrofit promotion campaigns may get most traction in late winter and early spring, as undertaking the works during summer can be much less disruptive than other times of the year.[101] Additionally, some studies show that integrating retrofits during planned home improvements can enhance uptake.[102, 103]

The misalignment between the national retrofit narrative and individual/household preferences creates a communication gap that hinders engagement and uptake. Homeowners may not see the personal relevance of grand narratives about emissions reduction, especially when faced with the upfront costs and perceived hassle of retrofitting. To bridge this gap, **communication strategies need to shift their focus to emphasise the tangible benefits for homeowners** without exaggerating them, such as lower energy bills, more comfortable homes and increased property value, indicating how quickly these benefits are likely to manifest. By highlighting these advantages, retrofitting initiatives can better resonate with homeowners, motivating them to act.[104]

Greater Cambridge local perspectives – findings from focus groups and interviews

Limited awareness and understanding of retrofit among homeowners and landlords were consistent themes emerging in several interviews and focus groups. Many individuals **lack clarity on what retrofit entails**. For example, many were unclear about what measures are included when we talk about 'retrofits', what measures would generate most significant energy savings, the distinctions between deep retrofits vs piecemeal and consequential improvements, in what order they should be undertaken, what the overall benefits are and how to navigate the process. As one participant noted, "A lot of people don't understand even that terminology [retrofit]."

The lack of awareness is compounded by **misconceptions regarding the costs, potential disruption and actual effectiveness of retrofit measures**. Unclear communication and lack of clear signposting add to this challenge, while negative media coverage of poorly executed projects erodes public trust. As one participant observed, "There's unfortunately... an awful lot of examples of where it's gone terribly wrong, and I think that just undermines [it]... why would I even want to approach that?"

The lack of awareness among property owners translates into a lack of perceived demand for retrofits. Homeowners may not prioritise retrofit if they are unaware of its long-term benefits, such as improved comfort or increased property value.

Several landlords also suggested that aesthetic property improvements are less expensive but have a similar, if not greater, appeal to tenants, who may be willing to pay higher rents as a result. Landlords also expressed frustration with what they perceive as an unfair regulatory burden compared to owner-occupiers, which can further disincentivise them from undertaking retrofit projects until they absolutely need to. As one landlord stated, "Why are we the ones who always should cough up the money?"

Lack of awareness is compounded by limited engagement with the resources available to help various users on the retrofit journey. While most of the local respondents exhibited a surface-level understanding of what benefits retrofit could bring, almost none of the respondents in the various target groups (private landlords, contractors and suppliers, housing association representatives) were aware of support available under Action on Energy, from the Cambridge City Council's 'Retrofitting your Home' guide, any relevant procurement frameworks or any fora where they could interact with other stakeholders. While qualitative data is not extensive enough to make a causal inference, this could signal that *how* the available resources are communicated to various demographics needs to be reevaluated.

Key learnings and actionable recommendations

Effective communication and engagement are crucial to scale retrofits. Landlords and homeowners need clear, accessible and trusted information about retrofit options, available support, skilled workers and the long-term benefits of energy efficiency upgrades. Many of them prefer information that comes from trustworthy local sources. Given widespread scepticism about long-term cost savings – due to high upfront costs of retrofit measures and the current price gap between gas and electricity – it is essential for communication to **highlight additional benefits of retrofitting**, such as improved comfort, health and property value. Some respondents suggested that the Council could tailor its messaging on retrofits to address the specific concerns and motivations of different stakeholder groups, focusing on practical benefits like "being able to watch telly in your socks" and "having a shower without having to wipe down the walls afterwards".

Residents also need access to a list of skilled professionals, including independent reviews of their work and information on how to contact these people, although views on what role the Council should play in this varied. The participants in the landlords and letting agents focus group engaged in a long conversation about what would be the most helpful way to access information about available contractors, expressing sometimes conflicting views. As one letting agent suggested, a council-run app or database could help landlords "dial in to get recommendations of builders [that the Council uses, leading to those contractors being] more widely seen by other landlords in the area". However, some participants expressed scepticism about the trustworthiness of council-endorsed lists compared to recommendations from trusted peers, highlighting the importance of reviews and feedback from unbiased and neutral users.

The data reveals a need for improved communication and co-ordination between local authorities, contractors and residents. All focus group participants and interviewees mentioned the need for clearer guidance and support from local authorities, emphasising the importance of **proactive communication** and **advice on compliance**.

The point about compliance was particularly important for landlords, who feel that currently these issues are more clearly and explicitly communicated only to landlords who own and rent out properties classified as houses in multiple occupation (HMOs).

Contractors and installers also need clear and consistent messaging from local authorities regarding policies, regulations and available funding. Some contractors also highlighted a need for better communication and collaboration across the supply chain to ensure quality and efficiency in retrofit delivery, indicating that the Council might be able to play a role in facilitating this.

Drawing on both existing literature and qualitative insights from the Greater Cambridge local context, we recommend that Cambridge City Council consider the following actions:

- **Conduct surveys for market segmentation** to understand various user profiles and their demographic characteristics, perceived barriers to retrofit, and how the Council could better support effective stakeholder collaboration to overcome these barriers. **A resident survey** could help the Council to improve its understanding of what types of concrete assistance and support different user groups would find most helpful, and what kind of 'client-focused' messaging about the benefits of retrofit would be most effective. The survey should be followed up with focus groups to validate the data, improve in-depth understanding of complex challenges and brainstorm ideas for more effective engagement.
- **Redouble efforts to provide clear and consistent information and advice** to residents on the benefits of retrofit (including the limitations of cost savings), available support and trusted installers. One way to improve the existing service would be to **target communication strategies to different demographics in a format that is accessible** to them. For example, some older property owners may find it difficult to find or to trust information from online sources, while others want to see for themselves what certain retrofits look like and how they work before investing in them. Messaging could also be targeted to emphasise retrofit benefits that are likely to resonate with the target audiences, for example wealthier householders may place more value on comfort gains than reduction in energy bills.
- **Demonstrate best practice by undertaking ambitious retrofit projects** in buildings, showcasing innovative technologies and approaches and sending a demand signal to service providers. Collaborate with contractors and property agents to make retrofits more visible through **standardised signage on properties being upgraded** and **highlighting energy efficiency ratings in property listings**.
- **Adopt new strategies to signpost the benefits of retrofit more effectively**, especially in ongoing exemplar projects such as the City Council's own Ross Street and Coldhams Grove project, CISL's Entopia Building Living Lab or those of other organisations such as the Cambridge Building Society and the Cambridge Retrofit Hub.[42] Organisations that retrofit their premises could **allow people near to and, after completion, into the retrofitted buildings to see retrofit in action**. On-site visuals such as clear signage and 'before and after' displays, combined with strong resident engagement through testimonials and clear communication of energy savings, are key to effectively signposting retrofit benefits. In the Council's own retrofit project, one home could be reserved for use as a 'show-home', where residents could visit on set 'event dates' to view the work, meet local contractors and learn more about the opportunities and challenges of the process. As demonstrated by some of the strategies adopted by the SEAI in Ireland (see case study on page 25), digital outreach via project websites and local media, alongside data on energy and carbon reductions, could further reinforce the value of retrofits. Additional activities that allow people to see retrofit in action could be supported by the City Leaders Climate Change Group (CLCCG).
- **Consider changing the key terminology and narrative** in promotional materials, replacing 'retrofit' with 'home energy improvements' [105] or 'refurbishment', while also emphasising the impact these improvements would have on comfort instead of focusing primarily on cost savings and emissions reductions.
- **Engage with residents and businesses** to share lessons learned and inspire action. This engagement could help the Council understand why people are reluctant to undertake retrofits and what they would like the Council to do to help. This could also include broader awareness drives that inspire people to take more action at an individual level, especially those that are more suitable for DIY approaches such as draught proofing.

Case study: Examples of how to improve awareness and engagement

- **Early and transparent communication is key.** Involving residents from the outset and clearly explaining the reasons for the retrofit, the process and the benefits is crucial. This includes detailing the improvements, the duration of work and who will be involved. The Council could develop something like the **Midlands Net Zero Hub's Tenant Engagement Toolkit**, which provides a step-by-step process and communication templates to help social housing providers develop effective tenant engagement strategies for retrofit projects.
- **Promoting community involvement:** Engaging with local communities through workshops, community champions, and sharing case studies from previous successful retrofits within the area can foster a sense of ownership and encourage participation. A good example of this would be the **Retrofit Action Week (RAW)**. This regional campaign developed by Low Carbon Homes uses online summits, in-person expos and community-led activities to raise awareness and provide knowledge-sharing opportunities about retrofit. While Cambridge City Council has previously conducted activities such as Energy Saving Week, the scale, frequency and visibility of these could be enhanced. **Highlighting the right and relevant resident benefits** can significantly increase buy-in. This can be done most effectively when using **accessible language** and the right **forum and tools for communication**. Different communication channels should be used to reach all residents effectively (eg, leaflets, meetings, digital platforms). Stockton-on-Tees was wary of 'digital exclusion' in their retrofit activities from the outset. To mitigate this risk and to respond to particular areas' needs, the council team focused on leafleting in selected areas – a strategy that led to growing engagement rates and registrations soon after. They also used a well-established local youth forum and Stockton-on-Tees' community volunteer network to support uptake.
- **Using digital tools and leveraging tech platforms** can help distribute information about retrofits for the tech-savvy demographic. Social media, videos and online platforms can be powerful tools for education, sharing updates and fostering conversations with residents, reaching a wider audience and providing easily accessible information. There are AI-powered tools in development, which could simplify the process for stakeholders.
- **Taking resident concerns seriously and addressing them proactively.** Understanding and addressing potential resident concerns regarding the retrofit process (such as disruption, who will be entering their homes and what support is available) is vital for minimising resistance. Supplementing this with **post-work support and education** can also be helpful. For example, Wolverhampton Homes' Retrofit Programme employs a dedicated resident liaison officer, who serves as a single point of contact to guide residents through the process, answer questions and address concerns. This practice has been effective in building trust and facilitating smoother project delivery.
- **Building trust** through developing real-world case studies can be immensely helpful. While Cambridge City Council has done so in the past, these case studies have been limited in number and reach (there are two on the Action on Energy website as well as some scattered in other guidance, or provided by voluntary organisations such as Cambridge Carbon Footprint). The Council could follow the example of Retrofit West, which has developed a compendium of detailed case studies to enhance engagement.

8. Recommendations for Cambridge City Council

Based on the thematic analysis above and the detailed recommendations for each thematic area, we suggest the Council prioritise the following actions to accelerate retrofits in the area.

1) Develop an evidence-based and holistic retrofit strategy

To build a robust strategy for scaling retrofit, the Council needs to fill the gaps in its evidence base. We recommend the Council do this by conducting a comprehensive housing stock and attitudes survey, integrating it with existing data on income, fuel poverty and heat maps using Geographic Information System (GIS) data for a granular understanding of need and opportunity. This data can then be used to enable the Council to define specific retrofit targets and create tailored intervention pathways for each market segment, from vulnerable households requiring fully funded support to 'able-to-pay' homeowners needing accessible finance and quality assurance alongside grants that cover part of the cost.

2) Collaborate with others in national-level policy advocacy

Working with councils that face similar challenges to retrofit as Cambridge City due to similar demographic and building stock characteristics (eg high-value properties, high degree of income inequality, high number of heritage properties or conservation areas, old buildings and student housing), would allow the Council to leverage the benefits of a combined voice emphasising shared challenges. Through this collaboration, the Council could exert greater influence than it can on its own when speaking to policymakers and stakeholders at the national level. The Council could also seek to establish and further develop existing relationships with organisations that actively engage in policy advocacy around retrofits and conditions that would facilitate faster action, such as the Institute for Public Policy Research (IPPR), the Royal Institute of British Architects (RIBA), The King's Foundation and the UK Green Building Council (UKGBC). Collaboration with these organisations could enable council representatives to provide case studies to publications and speakers to events that attract the attention of national-level policymakers. Systemic collaboration would enable more effective advocacy without a substantial increase in resourcing for this activity. Members of the City Leaders Climate Change Group (CLCCG) may also be able to support the Council in their retrofit-related policy advocacy.

3) Strengthen Action on Energy and improve awareness of its services

If possible, the Council could provide additional staff and improved digital infrastructure to enhance Action on Energy's capacity and amplify its impact. This would enable the partnership to deliver targeted multi-channel awareness campaigns (see recommendation 1), leveraging council digital platforms and traditional in-person outreach (such as pop-up clinics and door-to-door engagement in specific areas) to reach diverse demographics. These activities could be effective in including those who are digitally excluded and establish clear referral pathways from frontline council staff. The Council should also formalise its partnership with key stakeholders such as skills providers, Community Development Finance Institutions (CDFIs) and other financial institutions, contractors and similar bodies in the combined authority as well as other city councils (including councils that have similar demographics and building stock to Cambridge in other parts of England and Wales).

4) Supplement government finance through innovative funding and financing models

Cambridge could bolster retrofit finance by exploring local initiatives to complement national grants. This could include working with an organisation like Lendology to establish a council-backed revolving loan fund for 'able-to-pay' residents, thus providing accessible finance for those who do not qualify for grants or restricted-access low-cost loans but need support with upfront costs. Additionally, the Council could investigate opportunities for using renewable energy companies' community benefit funds to fund retrofit projects, and consider launching

local green bonds to allow Cambridge residents to directly invest in and benefit from local retrofit projects. 'Community-share' projects that target neighbourhoods rather than individual houses – allowing people to join projects that have already commenced – could facilitate access, especially among property owners who may have been reluctant to act on their own. The Council could also partner with academics and contractors to apply research and innovation funding to develop and pilot retrofit solutions for heritage listed properties.

5) Enhance engagement with key stakeholders and target each category appropriately

The Council has considerable leverage to convene and help coalesce the retrofit ecosystem at the local level. It can provide targeted support to individual stakeholders or bring them together so they can support each other. For instance, the Council could appoint a dedicated liaison officer for housing associations and private sector landlords, offering targeted bid-writing support for national funding. Similarly, partnerships with regional colleges are crucial to co-design and promote retrofit skills training, addressing the local supply chain gap. The Council could empower community groups to become 'Retrofit/Home improvement/Energy efficiency Champions' by offering small grants for local awareness events and peer-to-peer advice.

6) Carry out impact assessments of the Council's retrofit actions and collate these in a central repository

To ensure transparency and continuous improvement, the Council should carry out or commission an impact assessment of all its pilot projects and flagship schemes, and establish a central digital portal where these are made easily available. Currently, the advice, guidance and information about the Council's projects is presented in various formats across different sites (advice on the Action on Energy website, statistics on delivery in annual reports, advice from Citizens Advice Bureau). This piecemeal organisation of information hinders access and impact analysis. A portal that acts as a single source of data for all local retrofit schemes, case studies and resources would help spotlight what is being done, how effective ongoing and past interventions have been, and who completed the work. Internally, a robust project management system should track all ongoing initiatives against a set of key performance indicators (KPIs) covering uptake, impact (for instance: energy savings, carbon reduction, fuel poverty reduction) and stakeholder engagement, with regular public impact reports to drive accountability and refine future strategy based on lessons learned.

The following table summarises the more detailed recommendations provided within the sections above:

	National-level advocacy	Local level
Policy and governance	Stronger, more coherent and more stable national policies Stamp duty reductions for more energy-efficient homes Greater powers for local authorities on matters related to housing stock and planning Electricity market reform to make retrofit technologies/electrification more viable and cost effective	Develop a comprehensive local retrofit strategy Streamline planning processes for retrofit projects Provide social and private sector landlords with greater support and incentives Strengthen and expand collaborative relationships with other local authorities, housing associations and community-led initiatives, such as Sustainable Energy Communities (SECs) Consider implementing local building regulations if/when this becomes possible
Finance	Increased funding for retrofit programmes, with simplified application and clear information on eligibility and coverage Reinstatement of tax incentives for key stakeholders, such as private sector landlords	Facilitate access to national funding by providing grant application support Explore innovative financing mechanisms, such as revolving funds, property-linked finance and local green bonds Facilitate access to finance through local schemes or partnerships
Skills	Increased funding for skills More comprehensive training programmes that incorporate practical experience and multi-trade skills More stringent standards and standardised training protocols Introduction of a builder licensing scheme and accreditation to address quality concerns Simplification of quality assurance frameworks, such as TrustMark and PAS 2035	Work with local training providers and contractors to encourage collaboration Allocate funding to enable contractors to take on apprentices and attend upskilling courses Carry out a scoping study with SMEs and sole traders to understand their training needs and barriers to upskilling Support local contractors in adherence to national accreditation schemes and quality assurance frameworks
Awareness and engagement	Changes to the key terminology and narrative in promotional materials, replacing 'retrofit' with 'home energy improvements' and emphasising the impact these improvements would have on comfort instead of emissions reductions (this could also be done at local level)	Conduct research studies on market segmentation and public attitudes to retrofit Redouble efforts to provide clear and consistent information and advice to residents Target communication strategies and messaging to specific demographics Showcase best practice, innovative technologies and actions in council-owned properties using on-site visuals, case studies, client testimonials and digital tools Inspire action among individuals and communities by raising awareness of simple yet effective methods such as DIY draught proofing, and through appointing community champions and engaging with leaders through platforms such as CLCCG Collaborate with contractors and property agents to make retrofits more visible through standardised signage on properties being upgraded and highlighting energy efficiency ratings in property listings

9. Concluding comments

Retrofitting offers a multifaceted array of benefits, from financial savings and improved health and wellbeing to environmental sustainability and economic growth. By investing in the energy efficiency of our existing buildings, we can create a more sustainable and resilient future for generations to come.

However, retrofit rates in the UK lag behind what is needed to achieve the country's greenhouse gas emissions reduction targets and make the country's housing stock fit for the 21st century. Despite the region's above-average wealth, Cambridge has high levels of inequality and fuel poverty. Moreover, the region's performance in terms of retrofits and energy efficiency is comparable to the national average, suggesting an urgent need and opportunity to scale up action.

At the national level, scaling up retrofitting is about transforming the housing stock as a whole, requiring a systemic approach that addresses the wider challenges of energy infrastructure, supply chains and skills development.[106] Clear policies, financial incentives, industry upskilling and effective consumer engagement are all needed to transform the UK's housing stock into a more sustainable and energy-efficient asset. Some of the key actions need to be taken at the national level, guided by coherent and consistent national-level strategy that offers all stakeholders certainty over the future direction of travel. By creating a robust retrofitting ecosystem, the UK can ensure a just transition to a low carbon future, improve the quality of life for millions and generate significant economic benefits. Large-scale retrofitting can also play a vital role in enhancing the resilience of communities to the impacts of climate change, such as extreme weather events and rising energy prices.

The challenge of scaling up home retrofits is substantial, but not insurmountable. Although the national government sets the direction, a lot of the activity needs to happen at the local level, where stakeholders such as local councils are uniquely placed to understand and address the more specific contextual challenges to scaling retrofits. By empowering local action and fostering collaboration between stakeholders, local councils can unlock the full potential of retrofitting and accelerate progress towards a more sustainable built environment. However, to maximise the local potential, the government would need to grant local authorities more decision-making capacity over factors such as funding allocation, some eligibility limits, and building regulations for new-build properties.

In the Greater Cambridge context, the local factors present both challenges and opportunities for scaling retrofits. The key challenges relating to policy and governance, finance, skills, and awareness and engagement are outlined in Sections 4–7 of this report. The local-level data in these sections provides a wealth of information about what issues the Council should seek to address. The recommendations presented in each thematic section are designed to be actionable and grounded in the local context. Taking even small but strategic steps now will lay the groundwork for long-term transformation. Effective collaboration with other local authorities, local stakeholders and residents is key to success.

Some of the local characteristics outlined in Section 2 of this report present opportunities for scaling retrofits. For example, the fact that a larger than average share of local housing is social or private rented can be advantageous, as these sectors are easier to regulate than owner-occupied housing. Scaling up demand for retrofits in rental homes, possibly through joint procuring, would help economies of scale to develop, and may even incentivise owner-occupiers to act. By working closely with housing associations and private sector landlords, the Council could explore opportunities for collaboration and information sharing, while also supporting private sector landlords in understanding how they can best meet the incoming MEES and EPC standards. However, landlords may not be keen to engage unless their eligibility for government support is improved. Advocating more equitable treatment of landlords at national level could help create stronger relationships between the Council and private sector landlords, while also potentially improving access to retrofit funding for landlords and therefore the quality of private rented properties in Greater Cambridge.

Another opportunity is the comparatively large number of heritage listed buildings and homes in conservation areas. Any actions that the local councils can undertake to enable more retrofit activity in the heritage listed stock could make a difference. For example, more simple measures could be made available without planning approval. Cambridge City Council could also consider removing all fees from its one-to-one or property-specific guidance as part of the planning application process to encourage more property owners to explore what is possible and to form a clearer idea of the costs. Even if these consultations do not result in deep retrofits, they could deliver significant energy savings and comfort improvements. The Council could also maintain a list of providers who specialise in retrofitting heritage listed properties, and make this available to all owners of such properties.

However, in the context of limited financial resources, the Council would need to consider carefully how additional support for the owners of heritage listed properties could be funded. For example, some of the costs could potentially be covered by increasing planning application fees for property improvements that do not improve energy efficiency or reduce emissions. Another option could be to partner with academics and contractors, and apply research funding to develop a centre of excellence focused on developing minimally invasive retrofit solutions for heritage listed properties and properties in conservation areas.

One of the most important and immediately achievable actions the Council can take is to improve communication and co-ordination across the retrofit ecosystem mapped in Figure 1. The Council has the convening power to bring together residents, industry, finance providers and community organisations around a shared plan. This includes translating the complexity of retrofit processes, financing options and opportunities into clear, accessible information tailored to different stakeholder groups. Strengthening communication can also help build public trust in the workforce, while more active engagement with training providers and local suppliers will support the development of high-quality, accessible training pathways. These efforts can lay essential groundwork for scaling up retrofits in the local area.

Annex A: Retrofit delivery models

One-stop shops or retrofit facilitation providers

These provide a centralised hub for homeowners, offering comprehensive services like energy assessments, advice, financing options and connections to trusted contractors. This simplifies the retrofitting process and builds trust. These have been particularly successful in the Irish context as they simplify the retrofitting process for homeowners. Other examples from the UK include:

- Cosy Homes in Lancashire: a council-led scheme offering impartial advice, grants and a list of vetted installers.
- The SuperHomes Network: a network of retrofit co-ordinators across the UK providing tailored advice and support.
- Cambridge Retrofit Hub: an initiative currently in development.

Community-led and/or place-based retrofit

Empowering communities to take ownership of projects fosters local skills, knowledge sharing and social cohesion as well as allowing for customising approaches to localised needs and context. Evidence suggests grassroots approaches are effective at mobilising households as well as aggregating demand for local supply chain development.[107] Examples include:

- Carbon Co-op: supports community-led retrofitting with technical expertise, training and funding access. They have taken a few different approaches tailored to the communities that they function in. The **Levenshulme Area Based Scheme (ABS)** is trialling a street-by-street approach to retrofit to create savings and local benefits. The Retrofit project in Calderdale aims to train a set of retrofit champions in Calderdale and local workshops to upskill people and local contractors in engaging in retrofit, creating relations with Calderdale Council and Todmorden College. One of Carbon Co-op's most recent projects is a partnership with Connected Places Catapult and Oldham Council is also considering an ABS feasibility 'resilience' project in Oldham, looking at health and climate resilience.[108]

Local authority partnerships

Councils can play a crucial role in co-ordinating retrofitting efforts, leveraging their knowledge of local housing stock and resident needs. They can partner with housing associations, community groups and businesses to deliver projects at scale. Examples include:

- Nottingham City Council's partnership with Energiesprong: delivering deep energy retrofits for social housing.
- Cambridge City Council's 'Action on Energy' project and *Retrofitting your home* guidelines:[47] providing guidance and support for homeowners.
- Local Area Retrofit Accelerator (LARA), which aims to address the lack of demand and capacity in the UK's retrofit system. Piloted by the MCS Foundation and supported by Ashden, Connected Places Catapult, the National Retrofit Hub and the UK Green Building Council (UKGBC), the first four localities participating in the LARA pilot are Derbyshire and Nottinghamshire, Hertfordshire, Liverpool City Region, and Surrey.
- Better Homes Leeds:[109] Better Homes Leeds is part of the wider Better Homes Yorkshire initiative, a joint programme managed by the West Yorkshire Combined Authority and Leeds City Region Enterprise Partnership. Its primary goal is to help residents across Leeds (and other participating local authorities) to reduce energy bills and live in healthier, warmer homes by offering a range of fully funded or heavily subsidised home efficiency upgrades. These upgrades, often targeting low-income households and properties with lower EPC ratings, can include insulation (cavity wall, external wall, loft), solar panels and other energy-saving measures, often funded through government schemes like the Green Homes Grant Local Authority Delivery initiative. The programme also explores innovative financing models, such as 'property-linked finance', to enable broader uptake of retrofit measures across different tenures.

Annex B: Retrofit financing models

Public–private partnership models

Public–private partnership (PPP) financing models are crucial for accelerating retrofit. The PPPs combine public sector goals and de-risking mechanisms with private capital and expertise. The BRAVE project (Business Readiness Acceleration for Innovative Regional Energy Ecosystems), involving the City of Aarhus in Denmark, exemplifies this by using a blend of private loans and public guarantees to unlock significant investment for projects, like 70,000m^2 of municipal rooftop solar.[110] This approach aims to bridge the 'missing middle' of energy finance, where clean energy solutions struggle to scale beyond pilot phases due to a lack of suitable funding and partnership structures.

Local green finance

Community municipal bonds, crowdfunding platforms and local investment funds can channel capital towards retrofitting projects, engaging residents as investors and fostering a sense of ownership. Examples include:

- Abundance investment: Offers a national platform for community municipal bonds, enabling residents to invest in local climate action projects.
- Revolving loan funds: These funds provide loans for retrofitting, with repayments recycled to finance further projects, creating a sustainable financing mechanism. A good example of such a fund is Lendology[111] (see the case study on page 29 of this report for a detailed case study), which is being implemented in the southwest of England in counties such as Somerset and Devon.
- Southwark Council Green Buildings Fund (London):[112] Southwark Council has established a Green Buildings Fund, leveraging Section 106 carbon offset payments from developers. This fund is used to finance retrofit and low carbon technologies in council buildings. For example, it funded the refurbishment of 18 council homes on the Tustin Estate, including cavity wall insulation, triple glazing, air source heat pumps and solar panels, aiming for significant carbon savings.

Pay-As-You-Save (PAYS) schemes

Retrofit costs are repaid through a charge on the property's energy bill, making it accessible to those without upfront capital. A past example of this would be Green Deal finance. While the scheme has now ended, it offered financing for energy efficiency improvements, though with some limitations.

Grant schemes and subsidies

Local authorities can offer grants and subsidies to incentivise retrofitting, particularly for low-income households and those in fuel poverty. These can complement or supplement national schemes and enhance their effectiveness, or plug gaps and inadequacies where they exist. Examples include:

- The Energy Company Obligation (ECO): This is a national scheme that requires energy suppliers to deliver energy efficiency measures to households, with local authorities often playing a role in identifying eligible residents, especially those in fuel poverty.

By combining these delivery and financing models, local authorities can create a comprehensive ecosystem for retrofitting at scale. This requires strong leadership, collaboration between stakeholders, and a focus on community engagement to ensure equitable access to benefits and maximise impact. Further, local authorities can mitigate some of the uncertainty that stems from policy stability at the national level by providing a more stable and locally tailored policy and regulatory milieu.

Property-linked finance (PLF)

Property-linked finance (PLF) is gaining traction in the UK as a promising way to fund energy efficiency upgrades and accelerate the decarbonisation of homes.[113] It addresses a key barrier to retrofitting: the high upfront costs that often deter homeowners.[114] By linking the financing to the property itself, rather than the individual owner, PLF offers a unique solution that benefits both current and future occupants and de-risks the investment.

In essence, PLF works like a mortgage for energy efficiency.[115] A loan is secured against the property to cover the cost of upgrades, with repayments made through a charge on the property, similar to a local tax. This charge stays with the property even if it is sold, meaning the obligation to repay transfers to the new owner. This mechanism allows homeowners to enjoy the benefits of energy efficiency improvements, such as lower energy bills and increased comfort, without having to pay the full cost upfront. Methods such as these could channel billions of pounds for the purposes of upgrades and retrofit.[116]

Community benefit funds from renewable energy projects

Community benefit funds generated from renewable energy projects, such as wind farms or solar parks, offer a promising avenue for financing local retrofitting initiatives. These funds, often stipulated as part of planning permissions for renewable energy developments, are designed to provide direct benefits to the communities hosting these projects.

By allocating a portion of these funds towards retrofitting programmes, local authorities can create a virtuous cycle where clean energy generation directly supports energy efficiency improvements in homes. This approach not only helps to overcome financial barriers for homeowners but also fosters a sense of community ownership and shared responsibility for achieving local climate goals. Furthermore, it strengthens the link between renewable energy generation and its tangible benefits for residents, increasing public acceptance and support for these projects. A recent report from the Nature Conservancy lists several examples, including links to more detail.[117]

Property retrofitted as part of the Cambridge City Council's Net Zero retrofit pilot project

Annex C: Examples of localised retrofit projects around the UK

1. 'Deep Retrofit' programme in Nottingham

Nottingham City Homes, in partnership with Energiesprong UK, has been implementing a retrofit programme for its social housing stock. This involves prefabricated, highly insulated panels that are fitted to the exterior of homes, significantly improving energy efficiency and reducing carbon emissions. This approach aims to bring homes up to near-zero energy standards, with minimal disruption to residents.

2. Cosy Homes Oxfordshire[118]

This project takes a 'whole-house retrofit' approach. It involves a comprehensive assessment of each home's energy performance and a tailored package of improvements, including insulation, heating upgrades and renewable energy installations. The objective of the project is to maximise energy efficiency and reduce fuel poverty in a targeted area.

3. 'Eco-Council Housing' in Exeter

Exeter City Council has embarked on a programme to retrofit its council housing stock, incorporating energy-efficient measures such as solar panels, heat pumps and insulation. This initiative aims to reduce carbon emissions, lower energy bills for tenants and improve the overall quality of council housing.

4. 'Retrofit London' Housing Action Plan

This plan encompasses the entire city of London, driven by collaboration between the 33 London boroughs. They have a joint plan to improve the energy efficiency of London's housing stock, with targets for reducing carbon emissions and improving EPC ratings. This involves a combination of regulations, incentives and support programmes for homeowners and landlords.

These examples demonstrate the different approaches that local authorities are taking to scale up retrofitting in their areas. In assessing the above examples, we identify the following as critical aspects of success across these projects:

- **Partnerships:** working with housing associations, energy companies and community groups to pool resources and expertise.
- **Targeted approaches:** focusing on specific neighbourhoods or housing types to maximise impact and address local needs.
- **Comprehensive assessments:** conducting thorough energy audits to identify the most effective retrofit measures.
- **Resident engagement:** involving residents in the process to ensure their needs and preferences are considered.
- **Identifying and plugging supply chain gaps:** both through building out supply chains as well as aggregating demand to support sustainable growth.

Annex D: Leveraging positive feedback loops for maximum impact

Strengthening collaboration with community groups and local businesses would be beneficial, fostering a city-wide approach to retrofitting and maximising the impact of initiatives. Below we outline some of the feedback loops that were identified during the research, which help guide the Council's actions relating to retrofit.

Increased demand → reduced costs → further increased demand

As more residents undertake retrofit projects, the local supply chain becomes more efficient, leading to reduced costs for materials and labour through improved efficiencies in larger scale projects. This cost reduction, in turn, makes retrofit more attractive to other homeowners, further fuelling demand.

Local authorities can play a role in amplifying this loop by:

- Aggregating demand: facilitating group purchasing schemes to lower material and labour costs.
- Supporting local installers: providing training and accreditation to increase the number of qualified installers, preventing bottlenecks and ensuring competitive pricing.
- Communicating success stories: showcasing completed retrofit projects and their benefits to build confidence and encourage participation. Many people appreciate the opportunity to see and experience a retrofitted property before committing substantial amounts of money into these projects.
- Reframing the narrative surrounding retrofit to focus on cost and comfort.

Positive social norms → increased participation → stronger community support

When early adopters in a community undertake retrofit projects, it may create a positive social norm, especially if the work is demonstrably carried out in a satisfactory and quality assured manner. Neighbours see the benefits – improved comfort, lower energy bills, increased property value – and are more likely to follow suit. This increased participation strengthens community support for retrofit initiatives, making it easier to gain approvals for local policies and secure funding. The reverse can be true as well, where botched jobs can create a negative feedback loop.

Local authorities can nurture this loop by:

- Community engagement campaigns: highlighting the social and environmental benefits of retrofit.
- Peer-to-peer networks: creating platforms for residents to share experiences and advice.
- Showcasing best practice: featuring exemplary retrofit projects in the community.
- Engaging community leaders and community groups.

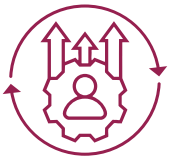
Access to finance → increased uptake → attracting further investment

Easier access to finance, such as grants, low-interest loans or innovative financing mechanisms, directly increases the uptake of retrofit projects. As the number of projects rises, it attracts further investment from both public and private sources, creating a virtuous cycle.

Local authorities can strengthen this loop by:

- Developing local financing schemes: partnering with financial institutions to offer tailored retrofit financing.

- Securing external funding: actively seeking grants and funding opportunities from national government and other sources.
- Providing clear information: offering guidance and support to residents on available financing options.



Upskilling → improved quality → increased confidence

Investing in training and upskilling local tradespeople ensures high-quality retrofit installations. This, in turn, increases homeowner confidence in retrofit, driving further demand and reinforcing the need for ongoing skills development.

Local authorities can facilitate this loop by:

- Establishing training programmes: partnering with educational institutions to offer retrofit-specific training. It should be high quality and comprehensive as well as providing hands-on training. There should also be opportunities for regular upskilling in a fast-evolving sector.
- Quality assurance schemes: implementing accreditation or certification programmes for installers.
- Promoting best practice: sharing information on quality standards and innovative techniques.

Innovative financing → increased accessibility → market growth

Introducing innovative financing mechanisms like green mortgages, property-linked finance or community investment schemes can make retrofit more accessible to a wider range of homeowners. Increased accessibility drives market growth, attracting more financial institutions and investors to offer retrofit products and services.

Local authorities can foster this loop by:

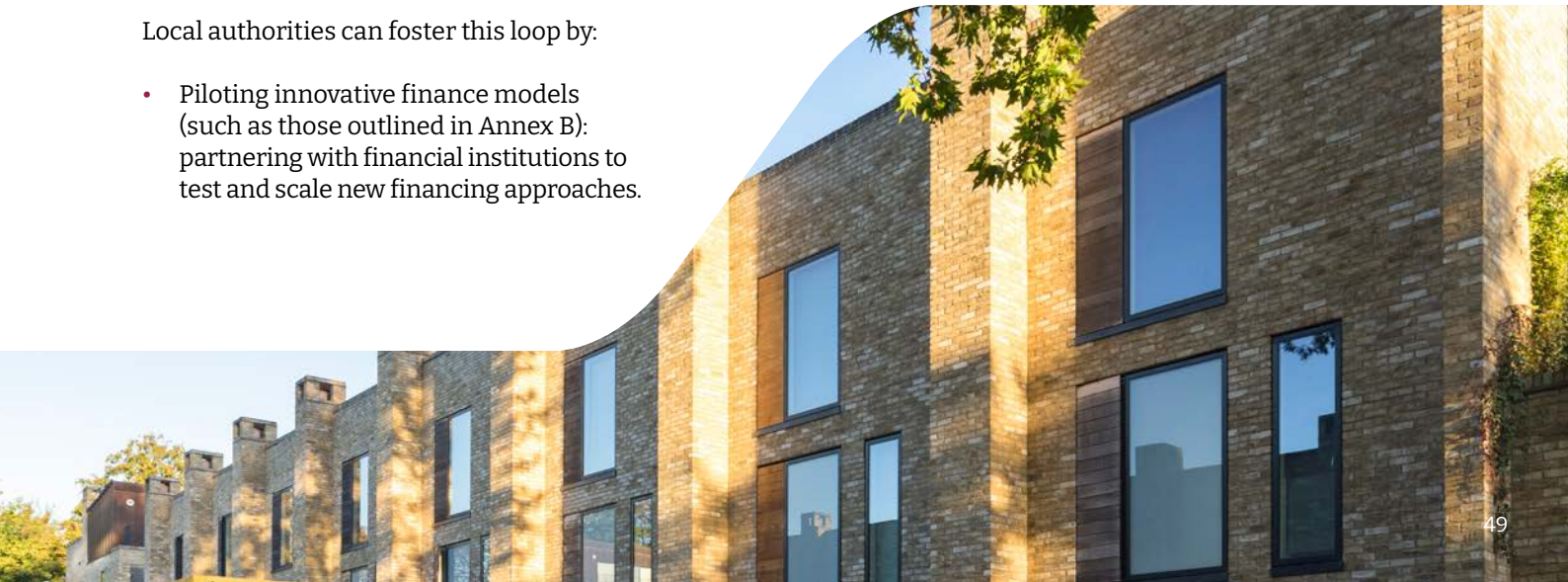
- Piloting innovative finance models (such as those outlined in Annex B): partnering with financial institutions to test and scale new financing approaches.
- Providing financial advice and support: helping residents navigate complex financing options. Different demographics have different levels of financial literacy and specific challenges pertaining to access of information, so those should be kept in mind when framing and communicating a menu of finance options.
- Creating a supportive policy environment: implementing policies that encourage investment in retrofit finance.

Strong stakeholder collaboration → shared vision → accelerated progress

Building strong collaborative relationships between the local authority, residents, community groups, businesses and other stakeholders creates a shared vision for retrofit in the area. This shared vision facilitates the pooling of resources, knowledge and expertise, leading to accelerated progress.

Local authorities can cultivate this loop by:

- Establishing a retrofit partnership: creating a forum for regular dialogue and collaboration among stakeholders.
- Co-creating a retrofit strategy: involving stakeholders (such as training providers, community leaders, parish councils, landlord associations, housing associations, contractors and suppliers etc) in the development of the local retrofit strategy.
- Communicating transparently: sharing information openly and regularly with all stakeholders using a variety of avenues such as in-person, newsletters, community forums such a town hustings, online portals etc. Not every communication platform is suitable for every demographic so the mix should be tailored according to the local context.



Annex E: Qualitative research engagement

The research outputs and analysis in this report are based on qualitative data collected through a literature review, a mix of interviews and focus groups carried out between January and April 2025 and a stakeholder workshop held on 3 June 2025 as follows.

Date of focus group	Type of participant	Number of participants
29 January 2025	**Council staff:** Negin Ghorbani, Cambridge City Council Jemma Little, Cambridge City Council Justin Smith, Cambridge City Council Joanna Taylor, Cambridge City Council Nick Speroni, Cambridge and Peterborough Combined Authority Ellie Haines, South Cambridgeshire District Council Additional staff members from Cambridge City Council and Cambridgeshire County Council	11
12 February 2025	**Contractors and suppliers in the retrofit sector including:** Keith Hume, 0800 Repair Nina Heigham, Aran Insulation Johnathan Mckenna, Macbrook Gas Gemma Birley, Peterborough Environment City Trust Edward Holynski, PHS Home solutions limited Marius Riabovas, Schnauber Adrian Marshall, The Retrofit Academy James Rixon, Within Planetary Boundaries Studio	13
26 February 2025	**Private Cambridge landlords/Letting agents** Private Cambridge landlords including: Matt Fielding Janet Johnson Ian Wyness Cambridge letting agent	5
3 June 2025 – workshop	**Members of the Cambridge City Leaders Climate Change Group**	25

Date of interview	Interviewee	Theme
4 February 2025	Emma Davies, Greater Cambridge Shared Planning Service Staff from Cambridge City Council	Planning considerations in retrofit projects
24 February 2025	Community leader in a local community interest organisation	Role of community retrofit projects and insight on local retrofits
4 March 2025	Negin Ghorbani, Cambridge City Council	Net Zero retrofit pilot project: opportunities, challenges and takeaways
10 March 2025	Government department	Retrofit and heat pump installation; perceptions of how the current retrofit landscape is affecting heat pump installation rates
17 March 2025	Bryan Padley, CHS Group	Insight on retrofit from a local housing association
18 March 2025	Joint interview between: Housing Services, Estates Division, University of Cambridge Darwin College Cambridge college	Experience of retrofits
22 April 2025	Hundred Houses Society	Insight on retrofit from a local housing association

The focus groups and interviews were recorded, and transcripts and summary notes were produced. The data and insight obtained in this way were subsequently analysed using thematic coding and combined with insights from the concurring literature review to produce the present research outputs.

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1. "The Seventh Carbon Budget," Climate Change Committee: February 26, 2025, https://www.theccc.org.uk/publication/the-seventh-carbon-budget/.

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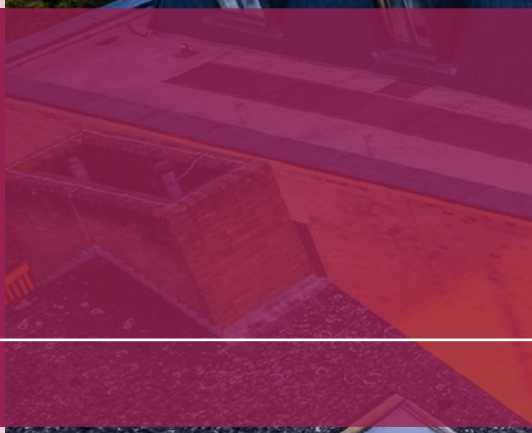

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