UKRI Innovate UK

INSIGHTS

Better Warmer Homes

Learnings from the Net Zero Living programme for scaling place-based retrofit

REGEN

Contents

Acknowledgements

About the Net Zero Living programme

Places across the UK are seizing the economic and social opportunities that come with decarbonisation, and creating warmer homes, cheaper local energy, new skills, and more secure work for their communities.

These pioneering places know what they need to do. But their teams are overstretched, and they have limited resources and investment. Innovate UK has provided funding, insights, and specialist technical assistance to nearly 300 businesses and local authorities, enabling them to adopt social, cultural, policy, and technical innovations that will help their place prosper.

Funding has been delivered across three streams:

- **Demonstrators:** practical demonstration projects showing how non-technical barriers for delivering place-based decarbonisation can be overcome.
- **Pathfinders:** support for places actively delivering net zero plans and have an understanding of systemic barriers to scaling and adopting solutions, with a view to progressing towards the demonstration phase in the future.
- **Fast Followers:** funding for a local authority to embed a net zero innovation officer who can deliver net zero pilot projects within the organisation and fully engage in the Net Zero Living programme to take learnings into their local authority.

About Regen

Regen provides independent, evidence-led insight and advice in support of our mission to transform the UK's energy system for a net zero future. We focus on analysing the systemic challenges of decarbonising power, heat and transport. We know that a transformation of this scale will require engaging the whole of society in a just transition.

Author

Alex Robertson
Local Net Zero Project Manager, Regen
arobertson@regen.co.uk

With thanks to our Net Zero Living programme partners for their contributions to this insight

Cardiff Council
Fife Council
City of York Council
Brightsparks
Urban Foresight
Stronger Stories
National Retrofit Hub
Innovate UK

Executive summary

The Net Zero Living programme has shown that local authorities have a central and wide-ranging role to play in supporting innovative and place-based retrofit programmes which are scalable and replicable.

Better Warmer Homes shares learnings for how their power as convenors, governors and asset managers can be used as powerful tools to accelerate innovative, place-based retrofit.

The UK's retrofit challenge

12.7Mn

2021 census data estimates 12.7 million homes in the UK are below an EPC rating of C.[3]

£400

£400 a year is the typical cost to households of poor performing buildings.

£1.4Bn

is the estimated cost to the NHS for treating illness directly related to cold, damp and dangerous homes.[4]

Whether at home or work, much of people's daily lives are spent between four walls. Providing comfortable, healthy and affordable environments for people is a big challenge with huge opportunities to create thriving places across the UK.

Overcoming retrofit challenges

Millions of households are in fuel poverty across England, Scotland, Wales and Northern Ireland with the average fuel poverty gap between £371 and £485 across the devolved nations.[1]

This not only impacts consumer bills, but has wider implications for physical health. Poor conditions and thermal performance of UK homes directly contribute to poor public health and, in extreme cases, excess winter deaths.[2]

For UK places seeking a sustainable future, retrofitting our building stock to create better, warmer homes is an opportunity to both improve lives and local economies.

Currently, investment payback for retrofit is complex. Both supply and demand are lacklustre, and the quality of installations can be poor. To address these market failures, local authorities across the UK have been seeking solutions to create quality, accessible services for consumers and expand local retrofit markets.

Achieving this requires collaboration and action from a wide group of stakeholders in the public, private and third sectors to support an equally wide range of consumers to start on their retrofit journey and improve the quality and health of millions of UK homes.

Local authorities want to see thriving local markets that can deliver their retrofit ambitions, create economies of scale to make retrofit more affordable, and ensure that the economic and social benefits of retrofit are captured.

Local authority partners throughout The Programme have shown that leading collaborations with innovators, educators, third sector organisations and technical experts is essential for achieving mass retrofit uptake at the local and national levels.

This insight draws learnings from 22 local authority-led projects and 21 insights produced by technical assistance partners. Funded by the Net Zero Living programme, these projects have identified innovative solutions for accelerating and scaling local retrofit.

Scaling and accelerating retrofit is inherently place-based and the Net Zero Living programme has identified a range of influential roles local authorities can play to grow thriving local retrofit markets. These learnings can be used by local authorities, policymakers and retrofit professionals beyond The Programme.

Insights from the Net Zero Living programme

1. Why?

Understanding the wider value of retrofit:

Local authorities need to understand the wide range of benefits retrofit can deliver to create the most accurate and compelling business case.

Cardiff Council's innovative modeling found that everyone £1 spent on retrofit could generate £5 in health, social and long-term economic benefits locally.

2. What?

Setting and enforcing standards:

Identifying the right retrofit measures, which meet national minimum standards and local rules on conservation areas, is crucial.

During the programme City of Westminister developed a solution using its local planning powers to streamline the process of retrofitting heritage buildings.

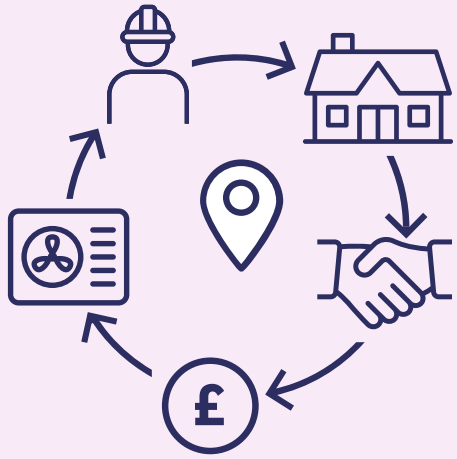
3. Who?

Scale and quality of local supply chains:

Understanding the skills, capacity and confidence gaps in the local supply chain is essential for planning local market growth to meet retrofit targets.

Fife Council's skills gap analysis enabled the local authority to develop a detailed delivery plan to meet the estimated fourfold increase in capacity required locally.

4. How?



Scaling place-based retrofit:

Consumers require accessible and affordable routes to engage in the retrofit market, requiring innovative solutions that address how we can retrofit our homes.

City of York one-stop-shop service has completed 24 retrofits by December 2025 and will break even by the end of 2026 with a target of 170 retrofits delivered.

1. Understanding the wider value of retrofit

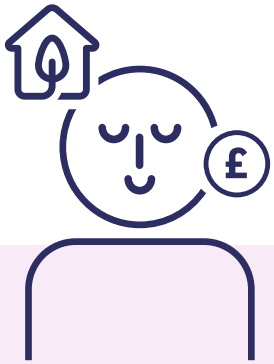
The start of a retrofit journey is to understand the why, by recognising the benefits of retrofit for local authorities.

National challenge for local delivery

Underpinning the slow progress on improving the energy efficiency of homes across the UK is a lack of understanding of the true wider value of delivering retrofit at scale.

- **2021 census data estimates 12.7 million homes in the UK are below an EPC rating of C.[3]**
- **£400 a year is the typical cost in energy bills to households of poor performing buildings.**
- **£1.4bn is the estimated cost to the NHS for treating illness directly related to cold, damp and dangerous homes.[4]**

Although primary drivers for retrofit in local authorities have been climate strategies and targets, Net Zero Living prgramme partners have been working to increase understanding and confidence in the wider value of retrofit within local authorities to create stronger business cases for action.



The value of upgrading all UK domestic properties to EPC C is £10.6bn[5] sustaining 400,000 skilled retrofit jobs by 2030, creating economic opportunities alongside healthier homes[6]

Case study:
Cardiff Council

Understanding and quantifying the wider benefits of retrofit

As part of The Programme, Cardiff Council has worked with technical assistance partner Bankers Without Boundaries to produce an innovative cost-benefit model which creates a compelling local authority business case for delivering city-wide retrofit programmes.

The study found that every £1 spent on retrofitting homes in Cardiff could generate £5 in long-term economic, health, socio-economic and environmental benefits.

Capturing the total value of retrofit

This innovative study, which assessed the true economic and social value of domestic retrofit, has been delivered as part of Cardiff's Let's Go Net Zero project, which is applying a sustainability lens to all stages of public service delivery.

A model was developed to assess the impact of retrofit investment on both fabric energy efficiency measures (e.g. roof insulation, double glazing) and installing low carbon technologies (e.g. solar photovoltaics (PV), heat pumps) – across four key outcome areas:

- **Health outcomes** from healthier, warmer homes;
  £10bn of investment to improve poor quality homes could provide NHS cost savings of £1.4bn per annum.[7]

- **Economic outcomes** of an expanding local retrofit market;
  £1m of investment in retrofit projects creates between 10 and 21 new jobs.[8]

- **Social and household level outcomes** from improved energy efficiency and building quality;
  Retrofitting leads to an average annual saving of £416 on energy bills.[9]

- **Environmental outcomes** from increased energy efficiency and reduced carbon emissions.
  Projected changes in domestic EPC ratings suggests a carbon reduction of up to 11.9% from retrofit programmes.

Combining public and private finance to deliver local goals

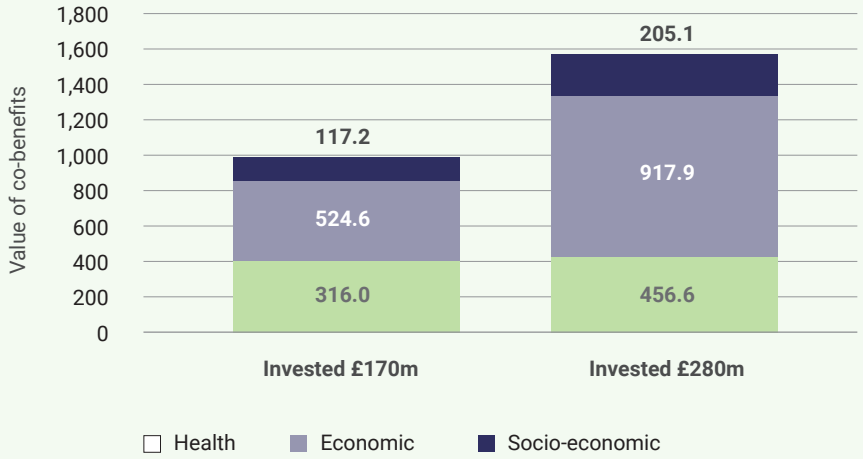
The analysis looked at the potential impact of two different large-scale retrofit programmes in the Cardiff Council area. The programmes combined retrofit activity for fuel poor households, supplemented with a small number of retrofits in the able-to-pay market over a 5 and 7 year period respectively.

The study found that a programme of retrofit investment was a significant opportunity for Cardiff to deliver its wider goals to improve social, economic, health and environmental outcomes by growing new local markets and deliver major long-term benefits across the four outcome areas.

Four outcome areas:

- **Combined value of retrofit programmes:**
  Every £1 spent on retrofitting homes could generate £5 in long-term economic, health, socio-economic and environmental benefits.
- **Improved health outcomes:**
  The programme could save the local NHS as much as £35m per annum.
- **Job creation:**
  Up to 4,480 new jobs could be generated in Cardiff across a seven year period.
- **Carbon reduction:**
  Up to 770,000 tons of CO2 emissions could be saved across 20 years.

Figure 1: Quantifying the Benefits of Green Investment in Large-Scale Residential Net-Zero Retrofits at a City Scale, Bankers without Boundaries, Cardiff Council.



The study concluded that the value of investment from both public and private sources, could be recouped in as little as 25 months through cost-savings and economic growth, while continuing to deliver long-term cost savings and growth well beyond the payback period.

While the study is unique to Cardiff, the approach of assessing wider benefits and attaching financial value to these is not and the methodology can be applied to other local authority areas.

This would enable other local authorities to follow in Cardiff Council's footsteps of using bold new modelling to create a stronger business case for local authority investment and use the study to support funding applications moving forward.

Identifying and creating value from local investment

Understanding the true value of public investment is the focus of an upcoming insight titled Valuing & Monetising Outcomes in Local Projects, produced by Bankers Without Boundaries.

The insight will help local authorities understand and apply practical methods for identifying and valuing the wider outcomes of public investments such as health, reduced inequality, and economic benefits. It will provide a concise overview of key tools, guidance, and case studies to support better decision-making and build stronger business cases.

Cardiff's innovative approach to modelling draws on these methods, with Bankers without Boundaries support. The identified benefits can serve as inspiration for other local authorities when reframing retrofit investments.

Insight

With action required from wider stakeholders to deliver local retrofit, there are opportunities beyond this modelling to use the evidence to support consumer and business engagement on retrofit benefits.

Urban Foresight produced an insight, Decision-making processes in housing and retrofit projects, following engagement with local authority partners, which found that direct community engagement was key to creating demand and addressing resistance from residents in social housing.

The insight noted that local authorities are well placed to help people navigate options and to act as an enabler for change, helping to understand bill savings that can be achieved through retrofitting their home, and wider benefits such as long-term health benefits for themselves and their families.

The upcoming Community Empowerment insight draws on the learnings for engagement for local net zero, which can be applied in the retrofit context.

Learnings

The start of a retrofit journey is to clearly understand the benefits, the "why". Understanding that retrofit investment can deliver wide-ranging benefits to people and places is a crucial first step for local authorities. With local authority resources constrained, more compelling business cases can be developed with the support of innovative and robust modelling and local authorities can take inspiration from the example of Cardiff Council to generate stronger evidence to unlock funding internally and from wider sources.

2. Setting and enforcing standards

Understanding what needs to happen in each building requires clear standards and enforcement.

Rising minimum standards

The steps being taken to better demonstrate the value of retrofit can help to increase the number of consumers starting their journey. The crucial next step in a successful journey is to understand what the right retrofit measures are and ensure these are enforced.

Owners and landlords of buildings, whether domestic, commercial or public, need to understand what measures need to be taken to improve the performance of buildings and meet minimum legal standards.

Local authorities have important statutory roles both in housing standards and planning permissions, which act as important levers to enable and accelerate retrofit activity, particularly in heritage buildings.

The programme has explored the implications of far-reaching policy changes announced during 2025 to unlock local action by raising the expected energy performance level of both private rented and social homes.

Local authorities have also worked to find innovative solutions to retrofit challenges, from making services more accessible, to recognising specialist retrofit needs in conservation and heritage settings.

A combination of nationally enforced standards and locally specific guidance are necessary to accelerate the right type of retrofit measures.

Getting it right: specialist heritage and conservation retrofit

Net Zero Living programme partners have been working across dozens of UK locations, all with different types of existing buildings and typologies. Many looked at the challenge of finding the right solutions to retrofit in heritage buildings and conservation zones, which local authority planning departments are responsible for providing guidance on and monitoring compliance.

Many places in The Progamme are in rural settings and Business Connect developed an insight into the unique challenges facing retrofit in rural contexts. The paper sets out key challenges, opportunities and detailed case studies of solutions being developed to grow local retrofit markets in rural places.

Local authorities have strong agency to influence local planning processes to streamline the retrofit of heritage buildings.

One of the primary challenges is conservation and heritage planning requirements. Regen produced an insight into Retrofit for heritage buildings: Lessons learned from local authority innovations, which detailed some of the innovative solutions that Net Zero Living programme projects were taking to these heritage challenges including barriers in the planning system and lack of specialist knowledge to complete works.

This insight outlined three approaches, including providing guidance and training on existing processes, using planning tools to streamline the process, and collaborating on innovative projects.

As an example of using planning tools, Westminster City Council, which is the local authority area with the most heritage buildings per square mile in the UK, explored using a Local Development Order to enable double glazing installations in a conservation area at Queens Park Estate. The process of developing this Local Development Order highlighted the importance of effective community engagement and the local authority's role delivering this.

Westminster also explored Listed Building Consent Orders, Heritage Partnership Agreements and a procurement club. In order to show residents what is possible, the council has also set up an energy-saving show home in the Queens Park Estate, demonstrating internal wall and floor insulation, thermally efficient windows, an air source heat pump, an electric hob, rooftop solar panels and battery storage.

The insight also explored opportunities for local authorities to collaborate on innovative projects such as Rossendale Borough Council Net Zero Terrace Streets, who have partnered with community-owned Rossendale Valley Energy to support an area-based retrofit project which includes properties in a conservation area.

In the project the retrofit measures have been designed to preserve and enhance heritage value; for example, external wall insulation was ruled out to maintain building appearances and some windows previously replaced with unauthorised PVC frames are being changed back to traditional timber frames.

Using local community expertise on heritage buildings

Other Net Zero Living programme partners have been engaging with heritage and conservation retrofit solutions, with Oxford's Low Carbon Oxford scheme seeking to unlock funding through corporate, social and environmental responsibility to support the retrofit of ageing buildings.

Forest of Dean Council has also unlocked funding for heritage retrofit, providing local towns with grants to retrofit heritage buildings in their places.

Projects in The Programme also worked with community energy organisations on retrofit, utilising their local existing knowledge of retrofit needs and their position as trusted organisations. For example City of York's ROSSY project used York Community Energy's existing knowledge of their heritage building stock and local reputation to deliver free retrofit assessments as part of its one-stop-shop model.

For local authorities working with partners, it's essential that the process is collaborative, ensuring that community organisation's local expertise and engagement approaches can be effectively embedded in retrofit programmes, and the third sector is not simply used for its low cost capacity.

Policy gap in space constrained homes

Some 1.8 million homes in the UK fall into the 'heat gap' between low-carbon heating policy. These are homes where individual heat pumps are very difficult to deploy due to severe space constraints, and where a lack of nearby commercial anchor loads means that commercially led heat networks are unlikely to be developed. Without a strategic approach from policymakers, these homes will likely be stranded with high-cost, high-carbon heating.

The thought-piece 'Mind The Gap' explored the issues with space constrained homes and recommended that further research and innovation was needed to identify the best approach to decarbonise space-constrained households.

The dense terraced streets in Rossendale were identified as a particularly challenging typology to decarbonise and the heating solution for these streets was explored in The Net Zero Terrace Streets project. Through detailed technical modelling, the team identified networked ground source heat pumps as the best solution, packaged with whole-house fabric upgrades and shared solar. They are aiming to finance this through an affordable standing charge model with no upfront cost, tested against real household energy bills to ensure it reduces, rather than increases, costs.

Partners in The Programme have demonstrated the importance of understanding the steps that need to be taken to retrofit their unique heritage buildings and are doing so in the context of changing housing standards.

As national policy evolves to demand higher levels of building performance, Net Zero Living programme partners have shown the important role for local authorities, with their planning responsibilities, convening power and opportunity to fund programmes of work.

Driving retrofit action through housing standards

During The Programme the UK government has proposed a suite of reforms to the energy performance of buildings regimes and housing standards, laying the foundations for the Warm Homes Plan in England and funding uplifts for retrofit in Scotland, Wales and Northern Ireland.

The Net Zero Living programme's Retrofit Policy Group, convened by Regen and the National Retrofit Hub, has been supporting local authorities to understand and respond to these policy reforms in buildings to ensure that updated energy efficiency and housing standards empower local authorities to accelerate the growth of local retrofit markets.

Together, reforms to Energy Performance Certificates, Minimum Energy Efficiency Standards (MEES) and Decent Homes Standards (DHS), represent a step change in ambition for housing standards and efficiency requirements, which will help to accelerate local net zero, tackle fuel poverty and reduce housing-related public health crises, with many of these reforms interrelated and reliant on one another to deliver the desired impact.

The Net Zero Living Retrofit Policy Group has been supportive of these changes and the ambition they encapsulate, recognising the transformative impact that it could deliver to our building stock.

While the level of ambition shown by Government proposals is welcomed, the policy group has consistently highlighted concerns regarding resourcing, skills and timelines which could impact the effectiveness of the plans, with local authorities responsible for:

- **Enforcement of MEES in the privately rented sector,** and enforcement of the Decent Homes Standard once introduced.
- **Investing in upgrades** to social housing stock owned by the local authority, particularly where higher standards require increased spend per property.

Local authority teams noted that they were already stretched in terms of resources, resulting in varying effectiveness in enforcing existing housing standards; many felt these new, higher standards would be challenging.

> **"Managing private sector Decent Homes Standards will be a huge issue for councils without increased funding"**
>
> NZL local authority participant

Better understanding the wider value of retrofit can help to create a stronger business case for the value of resourcing enforcement and upgrades to local authority-owned housing, as well as making progress against local and national retrofit targets.

Accessing this funding uplift will still remain a challenge for local authorities. The Retrofit Policy Group are therefore keen to work with government to understand how resource can be accessed and used efficiently to ensure that the ambitious new standards are properly enforced to deliver goal of accelerating local retrofit uptake.

The Net Zero Living programme has submitted four consultation responses, which capture these insights alongside others and can be found online here.

Alongside the Net Zero Living programme, Innovate UK's Net Zero Heat programme is helping to promote innovation that will support local retrofit markets with solutions that can meet increased standards. This includes examining demand reduction, rapid assessment of fabric improvements, and enhancing the use of data to inform heat decarbonisation measures.

Learnings

Understanding what needs to happen in each building requires clear standards. Identifying the right approaches and retrofit measures required to meet these standards is a combination of strong national policy delivered by place-based action and knowledge.

The Net Zero Living programme has shown that local knowledge and bespoke solutions are crucial. Acknowledging the challenge of resourcing a big increase in retrofit delivery and enforcement, further innovation will be needed to underpin how local retrofit is delivered across the UK.

3. Building scale and quality in the local supply chain

Consumers preparing to invest in retrofit need confidence in who is completing the work. Delivering local supply chains with the right scale, skills and quality is vital for accelerating retrofit.

Growing capacity and confidence

After answering why? and what? the next question is who? To deliver retrofit to the 12.6m homes below EPC C in the UK, we need to ensure that we have a vibrant, innovative, highly skilled and responsive retrofit workforce.

Local authorities have a clear interest in ensuring confidence in the scale and quality of local supply chains to complete retrofit work.

However local retrofit markets in many UK places remain nascent, with limited skills, capacity and consumer trust. Attendees at the Net Zero Living's Retrofit Policy group noted that a lack of consumer trust, underpinned by experiences of poor quality work, was significantly hampering attempts to grow demand in local markets.

In October 2025, the National Audit Office published a report which found that weak controls and oversight of the Energy Company Obligation (ECO) scheme led to faulty installations on a massive scale. With 98% of homes that received fabric energy efficiency upgrades as part of the scheme requiring remedial works.

To accelerate the uptake of retrofit across the UK, the quality of skills and capacity in these markets need to develop in tandem with demand. It is important to both ensure there is sufficient capability to deliver the work, and at the same time suppliers need to have visibility of projects and demand to be willing to invest in workforce skills. Developing a pipeline of projects will be explored in more detail in the third insight document, Planning, Pipeline and Finance.

For consumers, having a range of trusted options in the local retrofit market will inspire confidence and further grow demand.

The UK's retrofit workforce for heat and fabric efficiency insight, sets out details of projected workforce growth and opportunities for local authorities to focus their skills budgets. In addition, the insight also identified changes taking place in local retrofit supply chains, with SMEs and sole traders facing growing competition from large national companies.

Local authorities have recognised that this potential new market and demand for retrofit work could help to spur economic development in their areas by supporting the growth and development of local supply chains. Through the programme, local areas have been working to understand the role they can play in promoting retrofit skills and how their places can benefit.

These solutions are set out on the right, alongside examples where the approach is already being delivered.

Examples and evidence

Promoting career opportunities, e.g. through schools and job centres

BristolWORKS

Solar for Schools

Proactively investing in supply chain gaps, e.g. via procurement and social value contracts.

Cosy Homes Oxfordshire

Energy Saving Devon

YorEnergy

Leveraging trusted intermediaries for outreach

Northern Devon Primary Care Fuel Poverty Crisis Programme

Carbon Co op retrofit champions (Calderdale)

Codeveloping career pathways with key groups

Cornwall College Green Skills pathway

City of Portsmouth Net Zero Training Hub

Energy Skills Partnership

Having an internal 'supply chain manager' and facilitating a Community of Practice

Carbon Coop: Contracts and Supply Chain Officer

RetrofitWorks: Supply Chain Development Manager

Monitoring local supply chain health

International review of domestic retrofit supply chains, BEIS research 2021

Retrofit Skills Market Analysis, WECA

Funding free training

Funded home retrofit training for trade professionals

Approaches to supporting retrofit skills and supply chain

Local authority partners have been actively engaging with skills and supply chains as part of their Programme funding, collaborating with local businesses, educational institutions, and regional stakeholders to bring together all key stakeholders and better understand the gaps.

Newham Council has worked with Carbon Trust to investigate local workforce capacity and mapped it against retrofit ambitions for the borough. The study examined the expansion of supply chain capacity through training programmes and public procurement initiatives.

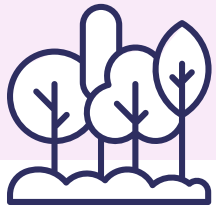
Staffordshire County Council in partnership with Keele University facilitated engagements between domestic consumers and local businesses. A key outcome from the work has been the development of a roadmap for green skills locally, which includes a public directory of verified suppliers and a skills taxonomy which supports local training providers respond to local needs.

Other projects worked to improve access to trusted suppliers:

City of York Council's ROSSY project has developed a supplier marketplace where consumers can access a database of accredited tradespeople across a range of retrofit disciplines. This step encourages contractors to seek accreditation and upskilling to feature in the marketplace and inspires greater confidence from consumers who trust the source of the information.

City of Westminster has been developing a Retrofit Procurement club, which similarly connects building owners with trusted supply chains with the specialist skills required for Westminster's place-based needs.

Developing and scaling retrofit supply chains in rural places is uniquely challenging with a wide range of barriers.



Unique challenges in rural areas

For places in rural settings, developing local retrofit markets can be especially challenging, and this has been explored by Innovate UK Business Connect, which is focused on accelerating ideas into real-world solutions, in its Retrofit in Rural Environments insight.

Retrofit in Rural Environments insight has explored the additional challenges of retrofit in rural areas due to a lack of economies of scale, a shortage of local skills and capacity for retrofit, conservation, or heritage planning requirements, and technological limitations for clean heating, such as limited grid capacity for heat pumps.

The insight used examples from North East Derbyshire, Norfolk, Somerset and others to explore opportunities for local authorities in rural settings to support retrofit, including:

- Engaging local suppliers and SMEs to overcome barriers to entry and grow local market capacity.
- Developing retrofit planning guidance bespoke to the archetype of the area.
- Creating partnerships with neighbouring local authorities and other key stakeholders like education centres, local businesses and community groups.
- Showcasing demonstrator projects to grow awareness and trust for retrofit consumers in rural places.

Harnessing public sector purchasing power

Using the buying power of the public sector is another area of significant impact for local areas. In May 2025, a Retrofit Skills and Workforce sprint was facilitated by Regen for Innovate UK and brought together four local authorities and four retrofit experts to identify a suite of a solutions for growing skills and workforce capacity in local markets.

The sprint explored how to make it easier for local people to train or retrain including transference of skills from declining sectors. They also explored how local authorities by retrofitting their own estates and social housing portfolios could support this directly via procurement functions, including by:

- **Demonstrating retrofit pipeline to local supply chain:** business engagement to highlight the scale of opportunity and encouragement to bid for publicly funded retrofit programmes. This can inspire confidence in market opportunity and lead to businesses investing in skills development and capacity growth.

- **Stipulating training, apprenticeship and upskilling requirements in contracts:** through procurement for retrofit on their own estates local authorities could be requiring organisations to invest in training and apprenticeships or hiring new professionals. These can be included and monitored in specifications for works.

- **National Procurement Framework for local authorities:** Participants felt that a national framework would be helpful to create consistency across local authority areas, while providing better tools for local authorities to develop innovative procurement specifications for retrofit. Consistency across local authority areas would give supply chains greater certainty and confidence to invest in skills and capacity by recognising the level of demand across multiple places.

- **Supporting SME and sole traders tendering for public contracts:** An underappreciated source of capacity is small businesses and sole traders. Opening up innovative procurement approaches which allows consortiums of smaller businesses to bid for this work with support provided on training and retrofit skills. This could open up new capacity and competition in local retrofit markets.

Local authorities have the power through their own retrofit procurement to encourage local economic growth, support innovation and create skilled local jobs. Setting out tenders which define the need for suppliers to support innovation and local market growth, local authorities can influence the development of the local markets and set a great example for other consumers to follow.

Consumers need to have choice and confidence in the local suppliers who enter their homes and deliver complex and costly retrofit works. For local markets, expanding the capacity and quality of retrofit skills is crucial to meet the scale of national and local ambitions.

Learnings

Local authorities have a powerful role in identifying the skills requirements of their place and influencing the development of these skills. The Net Zero Living programme has identified and tested a menu of options for delivering these skills and inspiration should be taken from the programme learnings as places across the UK seek to create skilled, sustainable jobs for the future.

Case study:
Fife Council

Retrofit skills and capacity in the Edinburgh region

More than 670,000 domestic properties in the Edinburgh and South East Scotland City Region will need retrofit measures over the coming decades, requiring an estimated £8.8bn of investment in buildings. Local authorities are clearly keen that their local supply chains can meet these needs and capture as much value as possible for their places.

Fife Council led a partnership that secured Fast Follower funding from the Net Zero Living programme to investigate what this might mean for their regional workforce.

The partnership included local authorities, universities and local colleges in the Edinburgh region, who were looking to use this understanding to help design educational programmes and to demonstrate local retrofit market opportunities to local businesses.

They identified that the local workforce would need to broadly quadruple from 8,000 to a peak of more than 26,000 by 2037.

They also worked to understand specific jobs required to improve building performance – which involved:

- fabric insulation; e.g. ceiling, floors, cavity and solid wall insulation;
- installing double and triple-glazed windows and doors;
- improved ventilation;
- replacing existing heating systems with individual heat pumps or connection to heat networks; and
- installing solar PV and batteries.

To deliver these changes, they estimated the need for more than 8,000 joiners, 4,000 project managers, 2,900 plumbing and heating engineers and 2,000 painters and decorators.

A further study also investigated skills barriers to efficient installation of heat pumps and found key challenges to be addressed as part of the action plan, including:

- Installers regularly install oversized heat pumps due to poor design training, which leads to inefficiency and higher consumer costs.
- Existing training focuses heavily on installation, with gaps existing in maintenance and troubleshooting problems, posing a threat to efficient operation and consumer experiences in the long term.
- Consumers were suffering from a lack of guidance on efficient heat pump use, particularly those in social housing.

They also explored the local clean heat manufacturing supply chain. Although many supply chains in retrofit are global, the work was able to provide an evidence base for locally based companies, such as Mitsubishi, to identify current workforce capacity and project future needs and transferable skills in the region.

Developing a collaborative plan for action

Fife Council have now produced an action plan supporting local authorities, educational organisations, local businesses, and others to work in partnership to develop and deliver a thriving local marketplace providing retrofit expertise and services.

The action plan sets out the following roles for three key stakeholder groups:

Local authorities:

- Leverage local authority skills and retrofit strategies and use their power as a trusted source of information and convenor.
- Developing public procurement frameworks to support growth in local retrofit and clean heat skills and markets.

Educational institutions:

- Institutions will be collaborating on a regional education strategy to deliver more training schemes to meet the needs set out in the analysis.
- They will also evolve communications and engagement to better inform and influence students and teachers on career opportunities in retrofit.

Local businesses:

- Regularly engage with local authorities and educational partners to inform the types of skills being offered by educational organisations locally.
- Provide workforce development capacity in their own organisations by offering more apprenticeships and training opportunities.

The delivery plan has been shared with regional stakeholders to carry forward. The Integrated Regional Employability and Skills (IRES) programme is led by the Edinburgh and South-East Scotland City Region city deal and is currently co-designing the IRES programme beyond its 2027 end date.

This project demonstrated the important convening role local authorities play with local stakeholders, to investigate future capacity needs and creating innovative, place-based solutions to inform regional delivery of education and skills programmes, and support local economic growth.

Consumers need to have choice and confidence in the local suppliers who enter their homes and deliver complex and costly retrofit works. For local markets, expanding the capacity and quality of retrofit skills is crucial to meet the scale of national and local ambitions.

Local authorities have a powerful role in identifying the skills requirements of their place and influencing the development of these skills. The Net Zero Living programme has identified and tested a menu of options for delivering these skills and inspiration should be taken from the programme learnings as places across the UK seek to create skilled, sustainable jobs for the future.

4. Scaling place-based retrofit

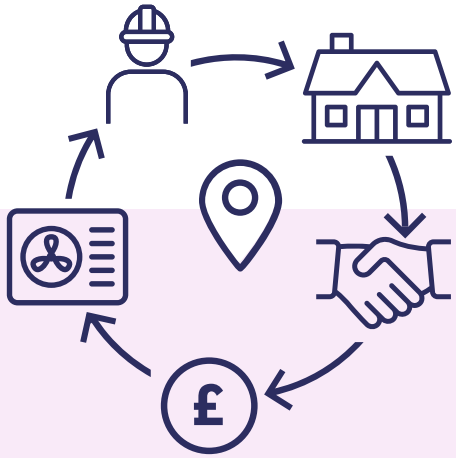
Support with knowledge, finance and project delivery is crucial for answering the question of how more retrofits can be completed.

Accessible and affordable consumer journeys

Though business cases, skills and standards play an important part in any market, bringing these elements together into a service model with financing is critical in answering the question of how retrofit will be delivered. Projects in The Programme have been taking innovative place-based approaches to building demand and providing finance in order to scale local retrofit markets.

These solutions need to meet the needs of a wide variety of retrofit consumers, from private homeowners, private and social landlords, housing associations and local authorities. The retrofit journey is not one size fits all and so services need to be agile to meet a variety of consumer needs.

Through the Net Zero Living programme, local authorities collaborated with specialist partners to develop innovative approaches that help projects progress more quickly from planning to delivery.

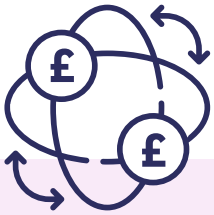


To quickly scale demand, local markets need infrastructure that makes the consumer journey from start to finish more intuitive, accessible and affordable.

Upcoming insight

Accessibility and affordability of retrofit finance is essential for all types of retrofit stakeholders and we highlight some of the learnings from the programme here.

The third Net Zero Living programme insight theme covers Planning, Pipeline and Finance and will be exploring lessons and learnings around finance and investment in more detail.



Creating financial solutions which support a variety of different stakeholders to buy retrofit goods and services in their local market is essential for mass uptake across local markets.

Developing local finance solutions

Finding solutions for financing retrofit at scale remains an important challenge. While some technologies like solar PV generate revenue, the vast majority of retrofit technologies like fabric insulation, double glazing and heat pumps provide financial benefits through cost saving with long payback periods and often significant upfront costs.

Developing low or no-cost financial models to support retrofit markets has been an important area of innovation for at least four of the Net Zero Living programme projects. A finance solution was felt to be the key to build demand particularly for domestic able-to-pay.

Demonstrator project Net Zero Terraced Streets Rossendale has been exploring replicable models to upgrade and decarbonise heating in terraced streets without any upfront or extra cost to homeowners, tenants and landlords. The proposed model funds works through a standing charge, alongside community level activity and engagement via clubs and 'Fairer Warmth', a dynamic platform that connects households with organisations to promote energy efficiency, affordability and a fair energy future for everyone.

Using a different approach with a focus on retrofitting commercial property was the Oxford City Council's Local Carbon Oxford scheme. The project wanted to support 3rd sector and SMEs who were often located in challenging heritage properties, to invest in retrofit and achieve lower energy bills. Their innovation matched these SMEs and charities to larger local businesses who were seeking to offset their carbon emissions. This service allowed the businesses to achieve their corporate goals at the same time as benefitting local economies and helping other local organisations and businesses to grow.

£200,000 was raised over an eight-week period by the service, successfully funding retrofit programmes that have improved the energy efficiency of buildings, reduced costs for SMEs and charities, and increased demand in the local retrofit market. A new insight from Programme partner City Science will be exploring what local authorities can put in place to support and drive demand in retrofit. It explores how to target engagement to different audiences and tailoring financial products for retrofit.

The one-stop-shop model

While designing solutions which address the individual barriers to local retrofit uptake is important, many of the barriers are interrelated, and retrofit customers can find the overall journey confusing.

The “one-stop-shop” model of providing end-to-end service for retrofit customers has been explored by areas across the UK with the aim of creating an easy customer journey, examples are both from within and outside the programme, such as RetrofitWorks. The Net Zero Living programme in particular has been exploring how local authorities can play a role in this service development from convening key stakeholders and serving as a trusted partner for consumers.

Perth and Kinross Council used its Pathfinder ‘Revitalise Homes’ project to engage communities and businesses across its place to support the development of a ‘One Stop Shop’ model which meets local needs.

The Council have now provided seed funding of £80,000 to launch the model beyond the Net Zero Living programme. The platform will focus on:

- Developing an online knowledge hub providing free and accessible information.
- Engaging with key funding organisations, such as the Energy Saving Trust, to improve access and processes for consumers to claim funding.
- Mapping green skills to identify the need for future training.

Learnings

Creating infrastructure in local markets that better enables access, affordability and confidence to consumers is essential for scaling retrofit across the UK.

Net Zero Living programme partners have piloted a range of innovative, individual solutions and explored models for aligning these solutions which can be used for replication and inspiration for other local markets.

Case study:
City of York Council

One stop shop retrofit service in the City of York

City of York Council has been using Net Zero Living programme funding to pilot the development of Retrofit One-Stop-Shop York (ROSSY), which has delivered the YorEnergy service.

Part of the local authorities' strategy for reaching net zero by 2030, the programme is exploring an innovative one-stop-shop model with its innovative lead business partner Brightsparks Agency. Alongside other innovators and community energy organisations, the project is seeking to bring all the required services for building retrofit into a single point of contact to improve consumer awareness, trust, accessibility and affordability.

Designing solutions for local retrofit need

The City of York Council's climate change strategy identifies that domestic buildings contribute 31.8% of direct emissions and therefore energy efficiency was a priority theme for the strategy. However most households in York are not eligible for energy efficiency grant funding. The project recognised that these "Able-to-pay" consumers face multiple barriers which is limiting the market for and up of retrofit measures. The ROSSY project identified barriers that included:

- Technical knowledge of retrofit and the benefits it can deliver
- Limited financial products available to undertake costly works (unlike other home improvements, like kitchens)
- Lack of trust in the installation sector
- Hassle factor of undertaking works

The project sought to overcome these barriers with a programme of work that engages citizens in retrofit and offers the solutions required to deliver scalable and sustainable local markets.

Solutions designed to overcome these barriers have included:

- ROSSY used York Community Energy's expertise to provide citizen engagement and trusted advice on retrofit, which included a free retrofit assessment proposition.

- Creating a network of past users to act as ambassadors who can advocate the benefits of the service to new users, with loyalty benefits given in return.

- York and North Yorkshire Combined Authority developed a database of a wide range of trusted retrofit contractors working in the local market, filtered by trust factors such as accreditation and insurance to inspire consumer confidence in the local retrofit supply chain.

- York and North Yorkshire Combined Authority launched the York Retrofit Network, a forum for retrofit professionals to meet quarterly to discuss barriers faced in the local market, co-design solutions, and develop partnerships to bid for work and develop scale in the supply chain.

- Developing a financial product with project partner Abundance through a local credit union to offer consumers accessible credit to fund retrofit works at an interest rate of 6.5% which is not asset-backed (secured against building or mortgage).

- Brightsparks Agency piloted an innovative approach to procurement, using supply chain engagement and a reverse auction model to commission a project of retrofit works on 34 properties with bespoke retrofit requirements requiring specific skills and local expertise.

- City of York Council provided two homes to be fully retrofitted and opened them up for guided tours, giving residents a real world view of the benefits of home energy improvements, and Energy Systems Catapult has since created a virtual demonstrator of the properties to offer a permanent, accessible way for people to explore the upgrades.

- York Community Energy developed an ambassadors network of retrofit "champions" to grow confidence and demand within communities.

City of York Council, with its ambitious net zero targets but limited resources and skills to deliver, has found that developing an end-to-end retrofit service in collaboration with innovation, community and specialist (e.g. finance) experts has knocked down barriers for the local retrofit market.

By leading the development of the one-stop-shop model in partnership with Brightsparks Agency, City of York Council has been able to utilise its local knowledge and net zero targets to inform the requirements of the service, while leading on Brightsparks Agency expertise as a societal and behaviour change agency to identify solution pathways and establish partnerships with other organisations to design and deliver services.

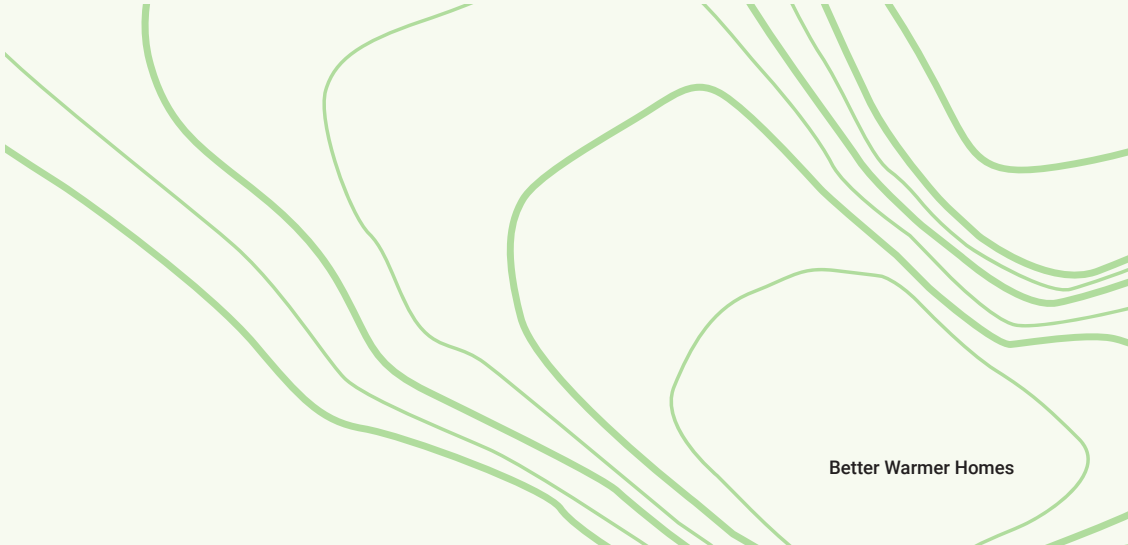
Scaling the One Stop Shop model in York and beyond

Having set up the framework for the service, ROSSY has moved into the delivery stage, as of December 2025 the project had:

- **42 completed retrofits**
- **85 households ready to begin works and supplier identified.**
- **147 households completed a home assessment**

Going forward the project is looking to develop a self-sustaining model for supporting able-to-pay retrofit customers beyond the Net Zero Living programme. The aim is to both expand the offering into new areas and achieve a break-even point by end 2026 with 170 completed retrofits.

YorEnergy has now launched its full service and is continuing to explore long term financial models that keep barriers to entry low for residents while generating the income needed to operate sustainably, including approaches where revenue is earned at the end of the retrofit process through contributions from suppliers, manufacturers and consumers.



Conclusions

Improving the performance of our homes can improve the wellbeing, health and wealth of communities across the UK.

The retrofit programmes that can build this future are local in their very nature and the Net Zero Living programme has identified a wide-range of innovations throughout the retrofit journey which can inspire bold change for the future.

1. **Bold and innovative approaches** to modelling benefits can help create compelling business cases for retrofit.

2. **Improved standards** are welcome but require innovative and bespoke local solutions to ensure our houses get the right upgrades.

3. **Confidence and scale in the supply chain** is urgently needed and local authorities have a powerful role to influence skills development and can take inspiration from the menu of innovative solutions for skills and capacity development from the programme.

4. **Consumers must have accessible and affordable options** in the retrofit marketplace in order for them to make an investment. Innovation is crucial for developing these nascent services and Programme partners have piloted solutions which can be replicated and inspire further new developments.

The Net Zero Living programme offers a mosaic of different solutions to varying challenges on retrofit. While all places have their different characteristics and needs, the learnings from individual projects and from technical insight and guidance developed throughout the programme should inform future developments for retrofit.

Whether it's a local authority seeking to break down barriers to retrofit in their community or national policymakers considering how government can better support local delivery in the future, the shared learnings from the Net Zero Living programme provides a breadth of knowledge and insight which can be taken beyond the programme.

A breadth of learnings and solutions can be taken beyond the programme to create better warmer homes.

Further reading and references

Programme webpage

Innovate UK Net Zero Living

Projects

YorEnergy

Net Zero Living Terraced Streets

Insights

Harnessing local skills for heritage and conservation contexts

Delivering retrofit in rural environments, Business Connect

The UK's retrofit workforce for heat and fabric efficiency

Decision-making in housing and retrofit projects

Coming soon

Community Empowerment insight - Theme 2
(Regen)

Valuing & Monetising Outcomes in Local Projects
(Bankers without Boundaries)

Financing retrofit
(City Science)

Pipeline, Planning and Finance insight - Theme 3
(Regen)

Useful link

Green Buildings Council Retrofit Playbook

References

1. Fuel Poverty Gap is the cost for the household to exit fuel poverty
2. IHE: https://www.instituteofhealthequity.org/resources-reports/fuel-poverty-cold-homes-and-health-inequalities-in-the-uk/read-the-report.pdf
3. ONS: https://www.ons.gov.uk/peoplepopulationandcommunity/housing/datasets/homeswithenergyperformancecertificateepcbandcorabovebyhouseholdcharacteristics
4. BRE: https://files.bregroup.com/research/BRE_Report_the_cost_of_poor_housing_2021.pdf
5. E3G: https://www.e3g.org/wp-content/uploads/The-home-energy-security-strategy-a-permanent-solution-for-lower-bills_E3G-report-1.pdf
6. IPPR: https://www.ippr.org/articles/train-local-work-local-stay-local
7. CCC (2016). Next steps for UK heat policy
8. Royal Institution of Chartered Surveyors (2020). Retrofit: saving energy and creating jobs
9. New Economics Foundation (2021) Financing Wales' Housing Decarbonisation

Innovate UK

Better Warmer Homes

This report was funded by Innovate UK.

The views and opinions expressed in this report are those collated from and curated by Regen supporting the Net Zero Living Programme, a collection of 52 local authorities, partners and communities working to deliver net zero projects in their local areas funded by Innovate UK.

Issue date:
10th December 2025

Report by:
Alex Robertson
Local Net Zero Project Manager, Regen

Regen
Bradninch Court,
Castle St,
Exeter EX4 3PL