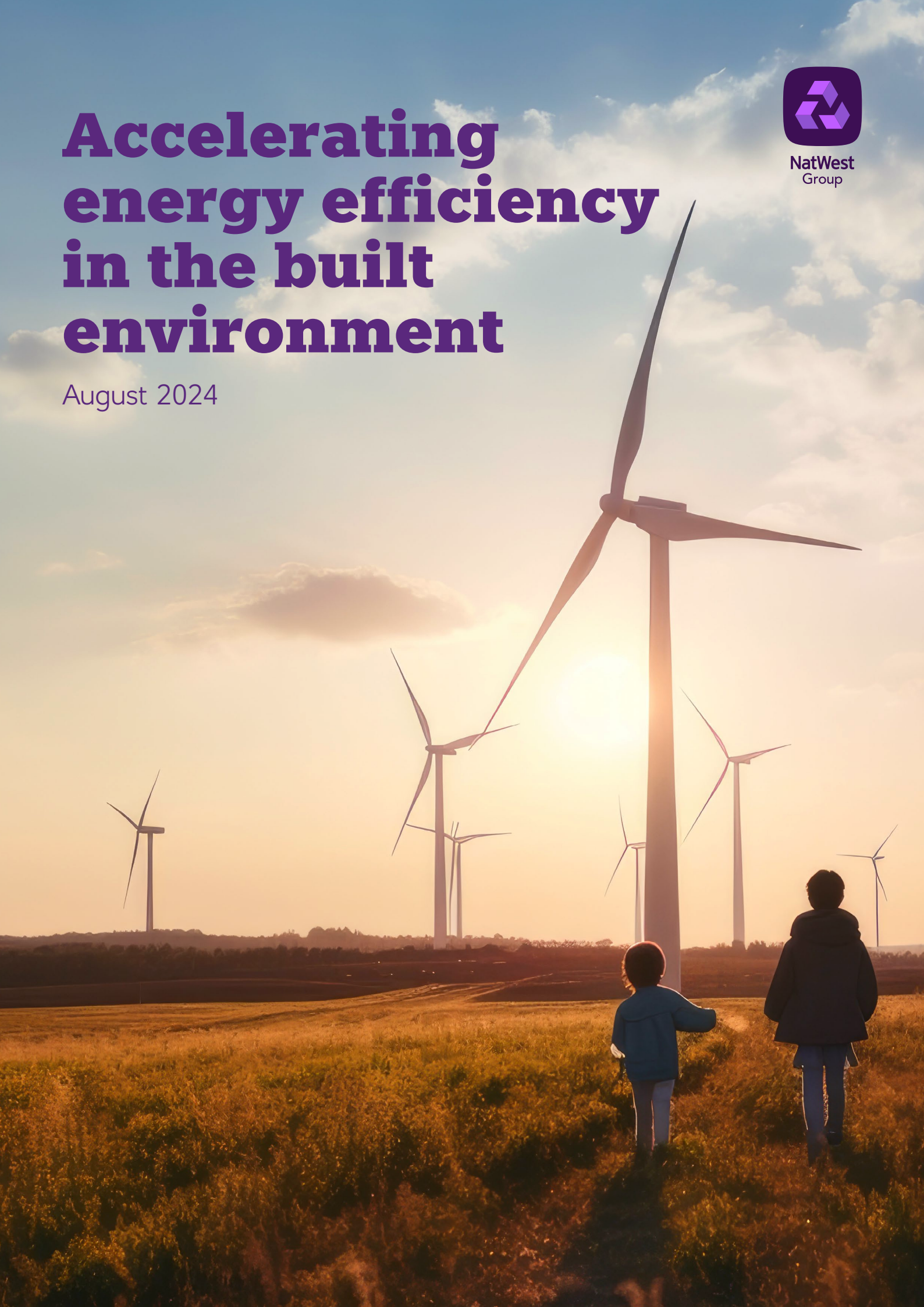
Accelerating energy efficiency in the built environment

August 2024



Foreword

Andrew Gray

Managing Director of Commercial Mid-Market, NatWest Group

The imperative to tackle climate change is more pressing than ever. A crucial step towards meeting this challenge is increasing energy efficiency in the built environment.[1] However, energy efficiency is not simply a climate issue: it can also boost GDP, improve energy independence, enable more efficient manufacturing, decrease emissions and place less strain on the public budget.

Increasing energy efficiency can help build a more prosperous, resilient and sustainable United Kingdom, by:

- Impacting positively on jobs, through investment in new, greener businesses, processes, products and services and the creation of new, green jobs.
- Impacting positively on communities through energy-bill savings for each UK household – a step towards tackling the cost of living crisis.
- Impacting positively on health, through cleaner air and healthy temperatures, as well as mitigating mental health issues arising from excess cold in homes.

Unlocking these benefits will require a step change in action. Today, despite many policy interventions, the UK's homes and buildings (the "built environment") still represent about 17% of all carbon emissions.[2]

To deliver significant change, the UK will need to accelerate action. It won't be easy: there are many barriers to overcome. Making the UK's buildings more energy efficient means tackling low demand, insufficient and fragmented supply, misaligned incentives and standards, limited financial support for installation costs and skills shortages.

Combined public and private sector action is needed to deliver the energy efficiency prize. Strong signals from the public sector can enable the private sector to deliver change at scale, while greater ambition from the private sector can allow the public sector to implement regulations needed to ramp up energy efficiency. Communities should be at the heart of all such plans.

The insights in this report can help move the built environment closer to net zero, achieving not only sustainability goals, but social goals, too.

Contents

Research process

The research process informing this plan involved consultations with more than 220 expert individuals across the public and private sector from close to 150 organisations, seven roundtables with over 200 attendees and drew on data from over 150 expert reports.

As such, this report is based on industry insights and general market observations, and does not represent commitments on the part of NatWest Group.

Acknowledgements

Marcos Navarro, Director & Sustainability Lead, NatWest Group

The aim of this report is to highlight the action needed to accelerate energy efficiency in the built environment.

Whilst there are many challenges facing us, I'm confident that if we harness the impetus for change, we can create positive opportunities that improve our communities, our economy, our health, and move towards a net zero environment.

NatWest Group continues to engage with communities, homeowners, private landlords and representatives from commercial real estate to understand their challenges and suggestions for actions.

I would like to thank each individual and every organisation who contributed time and expert insights to the research contained in this report.

I would also like to thank McKinsey & Company for support on the research and analysis underpinning the report and Douglas Knowledge Partners for editorial and design support.

Introduction

Energy efficiency benefits people, places and the economy. Increasing energy efficiency[3] can deliver a wide range of benefits for the country, including new green jobs, more affordable livelihoods, improved health, economic growth, decreased inequalities and increases in investment, energy independence, industrial productivity and an expanded public budget (Exhibit 1).

Exhibit 1

Energy efficiency could unlock benefits for people, places and the economy.

Industrial Productivity

Energy and resource efficiency mean that businesses can greatly boost their productivity by making more with less

Energy Independence

Energy efficiency can shield the nation from price geopolitical shocks like the Ukraine war, which cost the UK **£1,000** per adult through over-reliance on energy imports

Investment

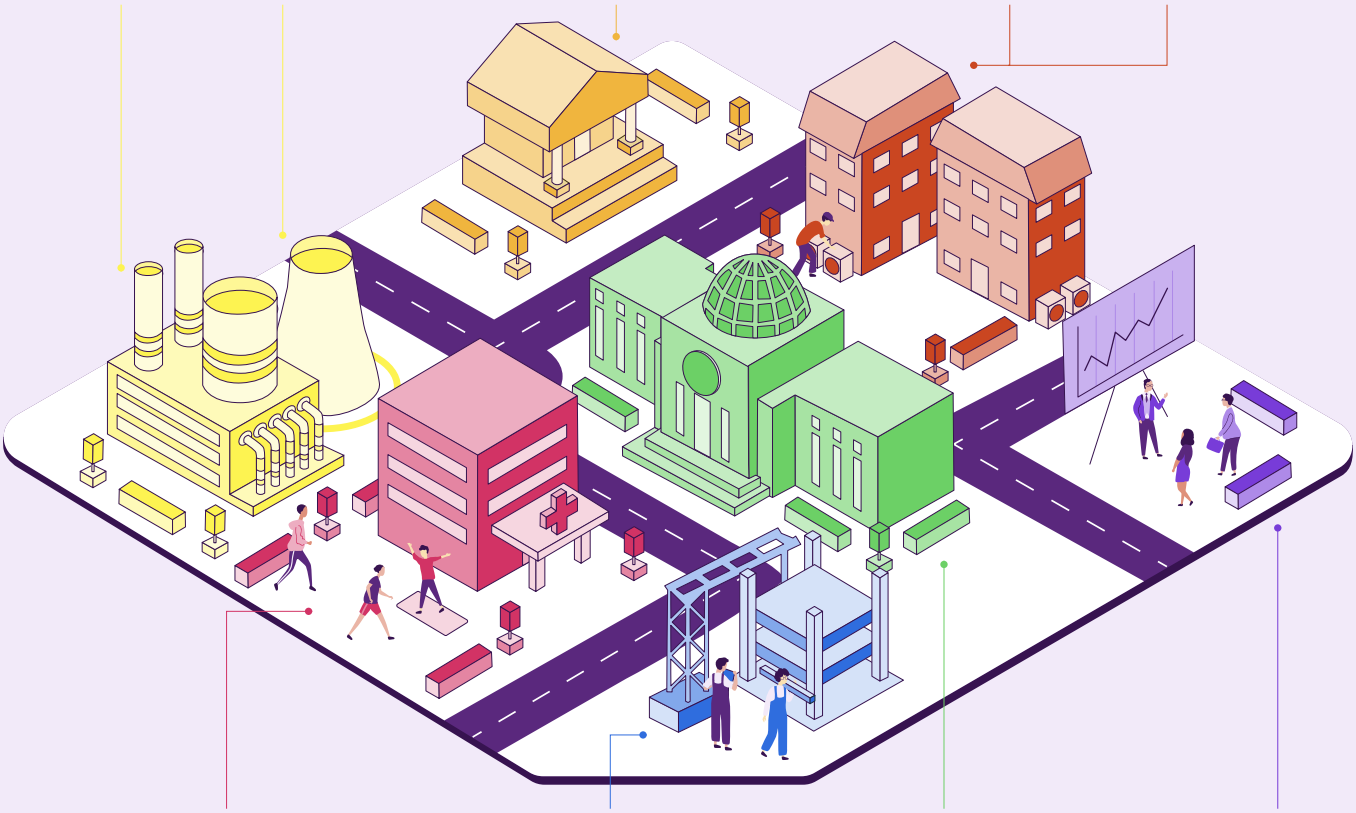
Billions unlocked by 2030, with measures in buildings unlocking up to **£100 bn** in private financing alone

Affordable Livelihoods

Insulating homes can reduce the UK's annual energy bills by up to **£7.5 bn**, or up to **£495** per affected household

Levelling Up

Energy efficiency can benefit local economies by creating jobs across the nation and particularly helping income-deprived regions by alleviating fuel poverty



Improved Health

Reduced exposure to the cold and pollution can save **320,000** life years over the next 27 years while saving health costs for the NHS

Green Jobs

Roughly **180,000** green jobs unlocked by 2030, concentrated in construction, installation, home advisory and high-skill manufacturing

Public Budget

Energy efficiency could generate up to **£1.25** in tax revenue for every £1 invested by the Government

GDP Growth

Each £1 invested in energy efficiency could produce up to **£3.20** in GDP

Energy efficiency can also tackle health issues, as cleaner air and comfortable temperatures impact positively on physical health. Additionally, excess cold in homes can lead to residents experiencing depression and anxiety.[4]

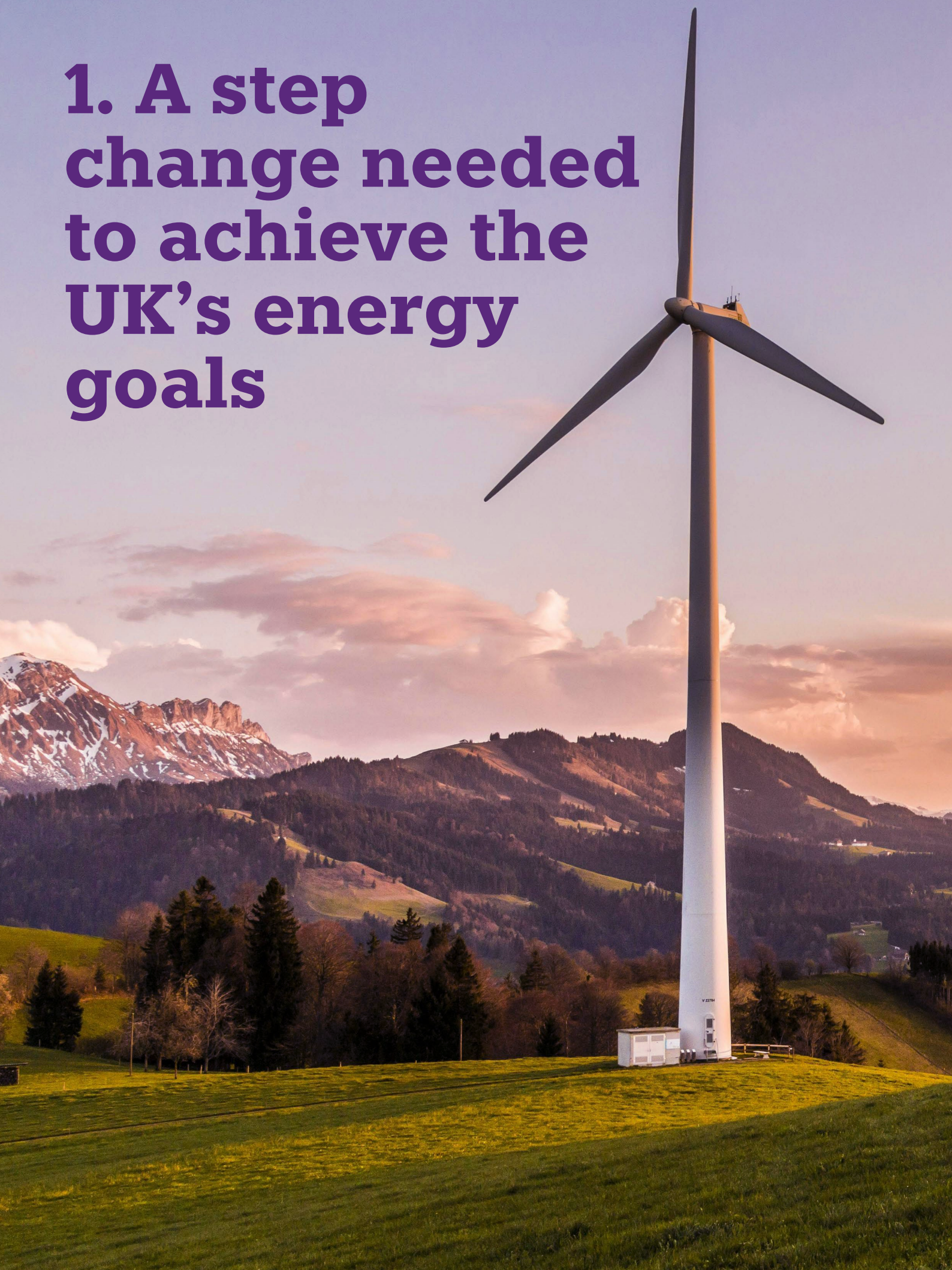
Naturally, energy efficiency can have a major positive impact on environmental sustainability and climate change, too. Energy efficiency is also a cornerstone of the nation's strategy to reduce fuel poverty. For example, insulating a home to get it from an Energy Performance Certificate (EPC) Band E to Band C can lower energy bills by as much as £800 annually.[5]

Energy efficiency can contribute towards energy independence. By using energy more efficiently, the UK can decrease its vulnerability to supply disruptions and protect itself from price fluctuations in global energy markets – all while boosting the economy and making industry more competitive.[6]

This report pinpoints eight opportunities for action to improve energy efficiency in the built environment to bring benefits to the entire UK:

1. **Provide long-term clarity on regulation, policy and future funding streams** – clear information about future standards and mandates can help businesses and individuals make investment decisions for the future.
2. **Ensure that individuals and companies have access to clear, accurate and reliable data on energy efficiency.**
3. **Increase demand and accelerate action,** particularly regarding pipeline density.
4. **Create a frictionless journey** for people wishing to improve the energy efficiency of their homes, including the design and launch of one-stop shops for retrofit.
5. **Improve supply chain and increase skills training in sustainability in the supply chain.**
6. **Better explain the potential value added,** so that landlords, tenants and owners have a clear understanding of the possible rewards of retrofitting and decarbonisation.
7. **Use public-private partnerships to accelerate delivery.**
8. **Match financial incentives and products** – both public and private – to demand.

1. A step change needed to achieve the UK's energy goals



Progress towards energy efficiency targets is key to reaching the government's Net Zero Strategy. Current activity is behind the level needed to reach targets.[7]

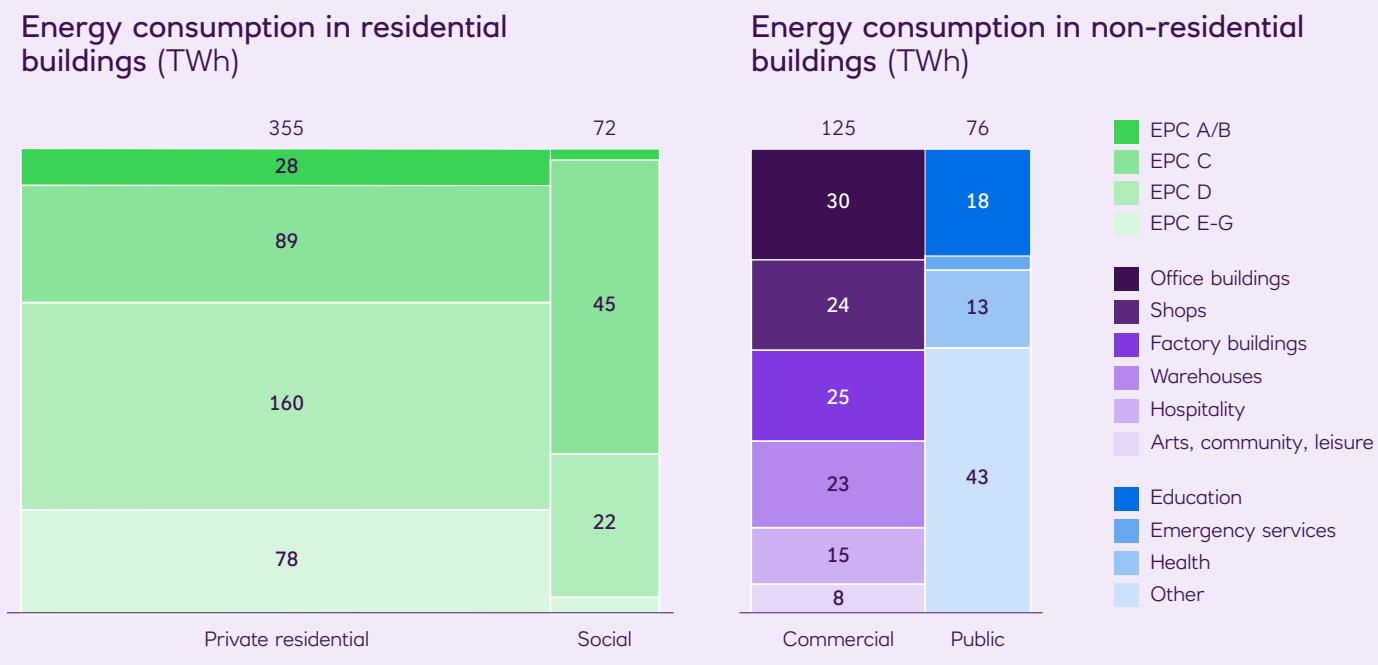
The deployment of insulation measures and low-carbon heat in buildings needs to increase more than tenfold over the next five years. In total, buildings demand ~600 terawatt hours (TWh) of energy per year, with the lion's share coming from private residential buildings,[8] followed by commercial buildings,[9] public buildings[10] and social housing[11] (Exhibit 2).

Bold action is needed to reduce the energy consumed by buildings through high-impact actions like shifting to heat pumps and reducing heat leaks through improved insulation, as well as using more energy efficient appliances and lighting. Heat pumps are especially crucial for tackling the energy used in heating, which is responsible for roughly 70% of a home's energy consumption.[13] Heat pumps are roughly four times as efficient as conventional fossil fuel boilers and could account for up to 45% of buildings' total energy demand reduction.[14]

To achieve the necessary demand reductions in buildings, **one million homes need to be treated with insulation measures annually by 2030,** up from 153,000 in 2021[15] and **over 600,000 heat pumps need to be installed annually by 2028,** up from 54,000 in 2021.[16] This ambition is set against a backdrop of declining insulation action, with annual insulation levels in 2021 being roughly a third of 2013 levels.[17]

Exhibit 2

UK buildings landscape is highly diverse and will require a paradigm shift in action to increase energy efficiency.[12]



Source: HM Government

Delivering action at the necessary scale will require billions in investment, but some interventions – such as heat pumps, cavity wall and loft insulations – are particularly cost-effective (Exhibit 3).

It's a gloomy picture. However, history and the UK's peers show that scaling up this deployment is possible. Past experiences show that it is possible to scale up energy efficiency actions in line with the UK's ambitions (Exhibit 4).

Exhibit 3

The UK needs to rapidly scale energy efficiency in buildings, requiring major investment, and many of these investments have good business cases.[18]

Energy efficiency measures need to scale rapidly…

…requiring £71 bn in investment in the next 7 years…

…which can provide major savings to households.

[1] Latest year of data availability.
[2] 2028 Government milestone for 2028 scaled to 2030 following CCC pathway, as no government milestone for 2030 is available.
[3] Low-carbon heat investment. Includes all energy efficiency investment in new homes. Based on Oct 2022 energy prices, installation costs for a typical semi-detached 3-4-bedroom home. Heat pump values from Nesta.
[4] Internal solid wall insulation.
Source: Climate Change Committee; Nesta; University College London

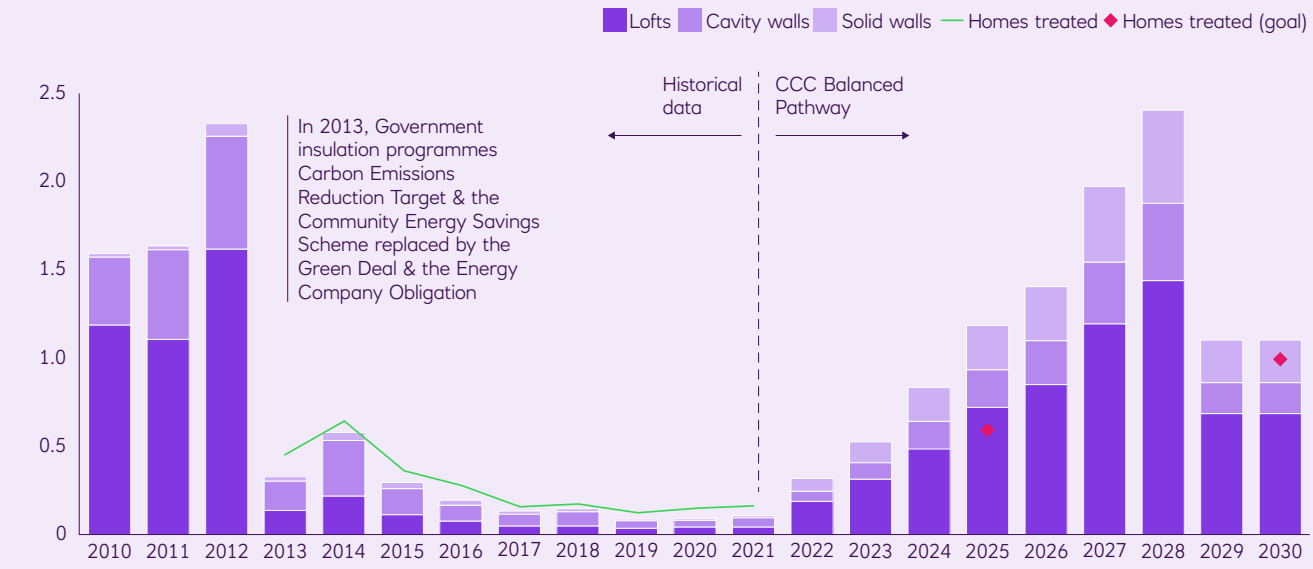
Poland and Germany have rapidly expanded the use of heat pumps in recent years. And more than one in two UK homeowners plan to enhance their property's sustainability over the next ten years.[19] Further, coalitions and industry-led networks in the UK are articulating what can be achieved through collaboration.

However, there are several barriers to overcome to meet energy efficiency ambitions in buildings. These are outlined in the next section.

Exhibit 4

The UK has made major progress in insulations before, and its neighbours are successfully making substantial efficiency expansions today.[20]

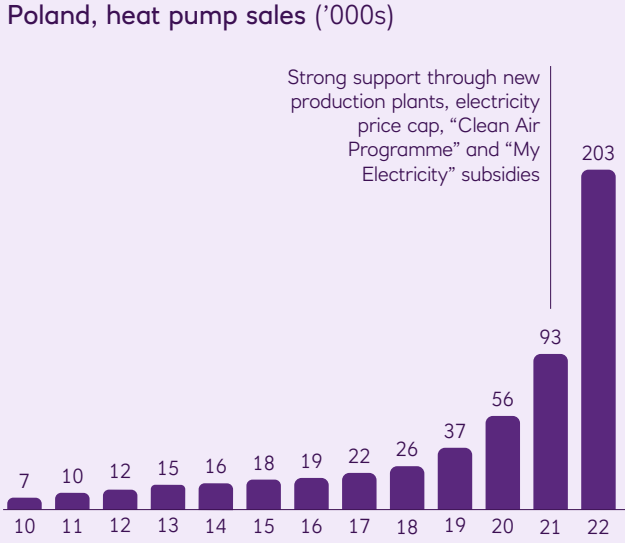
Annual home energy efficiency installations (millions), 2030



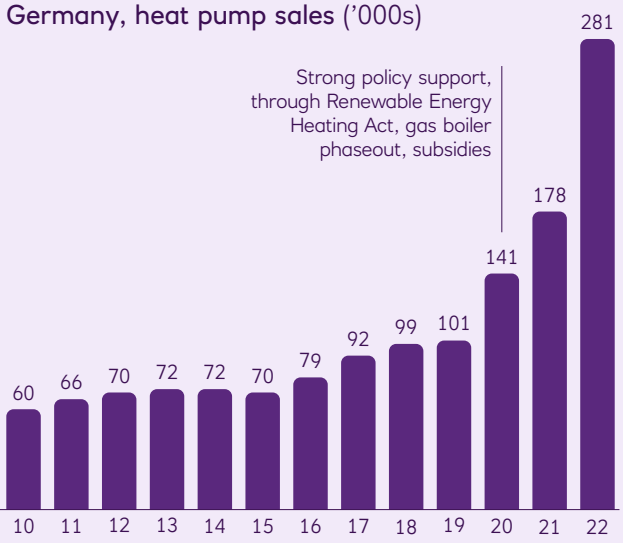
Source: UK CCC

...and peer countries have recently shown how heat pump sales can be scaled up rapidly.

Poland, heat pump sales ('000s)



Germany, heat pump sales ('000s)



Source: European Heat Pump Association; Statista

2. Barriers to overcome

In the built environment, there is significant need to align incentives, reduce installation costs, de-risk investments, upskill the workforce, align efficiency standards and provide more financial support. Barriers to energy efficiency vary across sectors but can be divided into four broad categories, offering opportunities for improvement within the UK.

1

Low demand

There is an opportunity to improve consumers' perception of energy efficiency measures, as the measures are often viewed as too expensive or risky, and people and businesses tend to have little time, low awareness or limited incentives to pursue them.

2

Insufficient and fragmented supply

There is an opportunity to enhance the supply of specialised products and services, facilitating easier access and availability.

3

Insufficient finance

There is a need to expand and diversify financing options that are attractive and aligned with consumer needs, thus enabling more accessible and favourable avenues for financial support.

4

Misaligned, fragmented or insufficient regulation

Regulation could be easier to understand and navigate, and should incentivise meaningful energy efficiency improvements and enable long-term decision-making.

Within these four categories, there are 17 major barriers preventing the UK from scaling energy efficiency in buildings (Exhibit 5).

Exhibit 5

17 major barriers prevent the UK from scaling energy efficiency in buildings.

Low demand	Insufficient & fragmented supply	Insufficient financing	Misaligned, fragmented or insufficient regulation
1. Lack of awareness	8. Insufficient skilled workforce	12. High upfront costs	15. Misaligned standards
2. Misaligned incentives	9. Equipment shortage	13. Limited benefits of green financial products	16. Fragmented public support
3. Cumbersome installation processes	10. Fragmented supply offering	14. Financing tied to misaligned standards	17. Insufficient public financial schemes
4. Low heat pump readiness	11. Lack of customer protection		
5. Limited demand co-ordination			
6. Unclear business case			
7. Lack of in-house capabilities			

Source: Ashden; BEIS; Citizen Advice; Climate Change Committee; Federation of Small Businesses; Green Finance Institute; HM Government; International Energy Agency; NatWest Group; Nesta; RA Brown Heating Serviced Ltd; Skipton Group; The Telegraph; Third Generation Environmentalism; McKinsey analysis

Low demand

- **Lack of awareness:** More than **45% of all homeowners report not paying close attention to sources of energy loss within their property**[21] and over half of UK homeowners are not aware of low-carbon heating systems.[22]
- **Misaligned incentives:** About 40% of the UK residential property stock is rented. Tenants usually pay their own energy bills,[23] so external landlords may lack incentives for improving energy efficiency.
- **Cumbersome installation processes:** It can take weeks to plan and implement a heat pump installation, a process that is also highly disruptive to homeowners.
- **Low heat pump readiness:** Currently less than 2% of households source their energy from low-carbon sources such as heat pumps.[24] However, heat pumps will likely drive more than 45% of the energy demand reduction in buildings[25] and currently over 80% of households with heat pumps are satisfied with their systems.[26]
- **Limited demand co-ordination:** Since individual building owners do not co-ordinate with each other to implement energy efficiency measures, installers cannot exploit economies of scale.
- **Uncertainty around business case:** Efficiency measures with long payback times and complicated financing options can make an unclear business case for energy efficiency.
- **Lack of in-house capabilities:** Building owners and managers often lack the in-house skills needed for understanding efficiency measures and accessing government support.

Insufficient and fragmented supply

- **Insufficient skilled workforce:** Over **150,000 additional skilled technicians** are required for energy efficiency installations in UK buildings by 2030.[27]
- **Equipment shortage:** The significant ramp-ups in energy efficiency deployment mean that supply chains will need to scale rapidly or face equipment shortages.[28]
- **Fragmented supply offering:** Fragmented offerings across the value chain make it more difficult for building owners to plan and implement energy efficiency measures.
- **Lack of customer protection:** Fragmented and insufficient customer protection mechanisms make investment risky for the consumer.

Insufficient financing

- **High upfront costs:** Energy efficiency measures are often capital intensive[29] – heat pumps cost on average £10,100 per unit for a medium-sized home.[30]
- **Limited benefits of green financial products:** More than half of residential consumers in a recent survey said they are unlikely to use traditional finance to fund energy efficiency measures.[31]
- **Financing tied to misaligned standards:** A large portion of financial products are tied to EPC ratings, which do not incentivise major efficiency upgrades.

Misaligned, fragmented or insufficient regulation

- **Misaligned standards:** EPC ratings are based on energy costs, not final energy use, and therefore do not always incentivise major efficiency upgrades such as heat pumps.
- **Fragmented support:** Customers and businesses need clarity on the long-term future of support schemes to give them confidence.
- **Limitations to public financial schemes.**

3. Actions to unlock the value of energy efficiency in the built environment

The research presented in this report pinpoints eight key opportunities that could rapidly accelerate energy efficiency in the built environment in the UK. Some of these actions could be led by government; other actions could be led by private sector actors, such as private landlords and commercial real estate companies. Still other actions may require deep collaboration between the public and private sectors, civil society and communities.

Progress in energy efficiency may, in many cases, require different organisations to come together to build coalitions and partnerships for joint action. There are some coalitions that are already in place that can step up to play a leadership role in energy efficiency. Examples include the 3Ci, UK Green Building Council, Pineapple Sustainable Partnerships and the Green Finance Institute.

1 Provide long-term clarity on regulation, policy and future funding streams

A predictable and consistent policy environment helps businesses and individuals to confidently invest for the future. Government has an opportunity to provide long-term clarity on the policy and regulatory roadmap, and grant allocation and future funding streams. Clear legal and regulatory frameworks allow businesses and individuals to plan and act accordingly.

Potential actions include:

- **Provide clarity on thresholds, timescales and implementation** of new energy efficiency standards across all building segments.
- **Provide clarity on existing duties,** such as heat provision and community-generated energy on regulated rents, in the context of innovative approaches to retrofitting.
- **Improve the awareness, surveillance and enforcement of standards,** especially in privately owned and rented sectors, coupled with enhanced communications and support to small private landlords and low-income owner-occupiers.
- **Launch a data-driven review of the housing stock for mandates,** identifying the minimum thresholds needed to support a phased plan to identify areas of easy implementation and co-benefits.

UKGBC: Radical transformation of the built environment so that communities can thrive

With thanks to Louise Hutchins, Head of Policy and Public Affairs, who gave time for an interview.

Collaboration for the radical transformation of the built environment forms part of a sustainable future for businesses and communities alike.

That is why the UK Green Building Council (UKGBC) and its more than 700 members try to influence policy by recommending sustainable solutions for driving the transformation. Its policy recommendations relate to existing homes and commercial properties, standards for new buildings and addressing embodied carbon emissions.

For example, the UKGBC is calling for a convincing ten-year plan for upgrading homes, including assistance to households that cannot afford it. A tool launched by the UKGBC in 2023 calculates the amount of investment needed, where best to channel funding and the relevant returns.

Other policy suggestions for existing homes include stamp duty reform to shift the market, upgrading investment properties by setting minimum standards for landlords and moving social environment levies from electricity bills to general taxation.

As for existing commercial properties, the UKGBC recommends implementing stronger minimum standards for large properties and encouraging green leases so that landlords implement the measures needed.

In this sector too, stamp duty reform would better reflect the value of upgraded commercial buildings and especially benefit owners of small commercial properties, who would also benefit from support such as tax breaks or grants.

When it comes to new building standards for future homes, an estimated one in five are already built to higher standards than those proposed by the government, according to the UKGBC.

Last but not least, an estimated one in ten tonnes of embodied carbon emissions in the UK economy is unregulated. Therefore, the UKGBC wants these to be measured in a standardised form, the data revealed and relevant regulations then implemented quickly.

When buildings are designed, built, owned and managed for sustainability, they deliver social value improvements and support environmental, economic and social well-being. This means that a sustainable built environment results in better health of people, communities and the planet.

The places where we work, live and play form a crucial part of the solution. The UKGBC calls for the fast transformation of our buildings, communities, cities and infrastructure so that people and nature can thrive.

Future Homes Hub: Bringing together the partnerships needed to deliver on the new home sector's climate and environment plan

With thanks to Ed Lockhart, CEO of Future Homes Hub, who gave time for an interview.

While the challenge of retrofitting existing UK homes to increase their energy efficiency has commanded significant attention in the conversation around reaching net zero in the residential homes sector, ensuring that newly built homes are as energy efficient as possible is also a key concern. The Future Homes Hub works to support the new home sector across the breadth of the UK's sustainability targets, including energy, water and resource efficiency, resilience, and biodiversity maintenance and improvement. It aims to ensure that new homes built in the UK have world-leading levels of energy efficiency, and that the sector is supported by science-based, robust and practical policies.

The Future Homes Hub aims to provide a long-term roadmap for the sector to achieve net zero while working with the sector to develop real world solutions for energy efficiency in new homes. The Hub was established in October 2021 and has rapidly scaled up to support the new homes sector. It works closely with a range of key stakeholders in the sector, including home builders, investors, supply chain, manufacturers and government, and helps to facilitate the necessary collaboration to ensure that the new homes sector can meet the pressing climate and environmental challenges facing the world today.

The Hub focuses on developing technical solutions for regulatory changes, as well as developing industry-led proposals for current and future policy challenges, which entails working with government to design individual policies, inform future policies and help design the solutions. The Hub also fosters sector-wide collaboration to overcome barriers to implementation, such as in skills or supply chain. Additionally, it works to ensure that the value of improving performance can be captured by creating a basis for measuring sustainability performance. Communication between all stakeholders in the homebuilding sector, including SMEs, is another key aspect of the Hub's mission, with the Hub facilitating the sharing of information and learning across the sector.

Informing policy to create new building regulations that will enable the sector to reach net zero by 2050 is a key part of the Hub's work. New building regulations came into force in 2021 which improved energy efficiency of new homes by around 30%, with the Hub producing technical guidance for the sector on how to meet the regulations. Looking ahead, the Hub is playing an integral role in informing the more ambitious Future Homes Standard.

This standard is intended to be mandatory for new homes by 2025 and aims to ensure that buildings complying with the standards produce 75-80% less carbon emissions than those built under the previous standards. Homes built under the standards will use electricity for heating and other allocations, so as the grid decarbonises, they will move closer towards being net zero. The Hub led a task group of over 170 expert stakeholders to inform the Future Homes Standard 2025, and regularly monitors the implementation of the standard through the Standard Implementation Board, which monitors the progress of the policy quarterly to ensure that it will be able to be implemented across the industry.

Although ensuring that new homes are energy efficient is a key factor in reaching the UK's net zero goals, only around 20% of homes in 2050 are likely to be newly built under the Future Homes Standard. This underscores the importance of retrofit, which can be informed and enabled through new home building. Sustainability gains in new homes can help pave the way for retrofit by providing an opportunity to test new technologies and how they can be applied to diverse home types, as well as creating a supply chain and skills base for key technologies.

The Hub also works to communicate tests, trials and pilot work being conducted across the UK on energy efficiency in homes and to ensure that best practice becomes widely known and can be applied across the board through tools like its low carbon homes trials and demonstrator map. This collects information on the large number of tests, trials and pilot work being undertaken by homebuilders across the UK in preparation for the Future Homes Standard and makes it available to stakeholders across the sector to ensure that valuable lessons and experience are as widely known as possible.

As the new homes sector looks to the future, not only solving technical issues but also providing strong and co-ordinated leadership is of crucial importance. To help plot a course for the new homes sector, the Hub brings together a cross-section of around 20 CEOs from across the industry who meet every six months to chart the path forward for the sector and ensure that an energy efficient future for the sector is firmly supported by ambitious and workable policy.

2 Ensure that individuals and companies have access to clear data on energy efficiency

What you cannot measure, you cannot change. Currently, the EPC measure is an estimate and does not provide the actual energy performance of a building. Evidence shows a significant performance gap between design and operation in buildings. EPC implementation is also inconsistent, lacking enforcement and various recent consultations have created uncertainty, inhibiting private sector action. Further, responsible financing requires robust data and transparent impact assessment.

Potential actions include:

- **Ensure that the EPC regime is fit for its purpose** and provides an accurate indication of the potential energy efficiency of buildings.
- **Consider broadening the focus of the EPC system from energy cost savings to carbon.** By adjusting the methodology to reflect carbon savings, the EPC system could enable data-driven decisions.
- **Increase energy efficiency disclosure across the real estate sector,** initially through voluntary action in the private sector on ratings, building on the success of voluntary initiatives to date.
- **Support managers of social housing and public buildings to develop and implement energy efficiency programmes** by setting up an energy efficiency community to share best practices.
- **Facilitate access energy efficiency information** to drive building renovation by ensuring that information on the energy efficiency of buildings (including metering) is accessible and accurate.

Kamma: Delivering the data needed to drive the built environment to net zero

With thanks to Joe Webb, Chief Growth Officer at Kamma, who gave time for an interview.

In today's data-driven world, accurate, accessible and reliable data to inform sound decision-making has never been more important. Kamma's goal is to generate accurate and up-to-date property data to empower homeowners, lenders and other stakeholders to make better decisions and accelerate the UK property sector towards net zero.

Residential property has been the slowest of all major emitters to decarbonise, having only decarbonised by 14% since 1990 compared to, for example, energy suppliers, which have decarbonised by 68% in the same period.

A major factor hindering decarbonisation in the sector is the lack of accurate and up-to-date data. Although it is generally freely available, property data is overwhelmingly generated through manual data entry, and can be difficult to acquire and integrate at scale. As a result, it is often inaccurate and unreliable. The data is also often out of date. For example, more than three-quarters of UK homes have energy performance certificates (EPCs) that are more than five years old or have no EPC altogether. While the data available may historically have been sufficient for mortgage lenders and homeowners since property risks tended to be limited, climate change and the energy crisis have changed the game, creating new challenges at a blistering pace.

To tackle these crises, the industry needs more effective tools. The data currently available to the industry is often too inaccurate to convincingly make the case for switching to cheaper renewable energy sources and retrofitting to improve energy efficiency, hindering the retrofit revolution that will be needed to meet net zero goals – four million more retrofits could be delivered if homeowners were offered more accurate data and better advice. At the same time, inaccurate data can prevent capital from being directed to lower-risk green investments.

Kamma addresses this issue through comprehensive and innovate environmental property profiling, mapping parameters from environmental impact to property regulations from a portfolio level to individual addresses to generate clear, actionable insights. Different properties may be represented differently in different datasets, and matching the same property across different datasets can be a challenge, particularly at scale across millions of properties. Using machine learning techniques, Kamma can match properties across multiple datasets to build a deep energy and environmental profile on the property. In a field trial, Kamma was able to match 97% of addresses, compared to around 80% by competitors.

To enable the retrofit revolution needed to propel the UK property sector towards net zero, Kamma has created a retrofit optimisation engine which can generate the cheapest route to reach homeowners' energy efficiency goals. Due to inaccurate or out-of-date data, retrofit costs are often overblown, and customers are frequently put off by these large, estimated, upfront costs. Kamma's retrofit optimisation engine can accurately show the benefits and value of retrofits and can chart a cost-effective and efficient route for homeowners to get the greatest possible benefit from retrofits at the lowest possible price, incentivising homeowners to retrofit.

Better, more reliable data that accurately shows the value of retrofits can increase the flow of capital into retrofitting, while also helping investors secure cheaper loans, which translate to cheaper loans for customers. The stakes of making the right decisions are high. The best data possible is crucial to inform strategies, lending policies and individual retrofit decisions for the best possible outcomes for people and the planet.

3 Increase demand and accelerate action

Scale is required to address the challenge of reducing emissions from homes, and pipeline density is a key driver of scale. Upgrading social housing can be a powerful lever to create the material pipeline density needed to improve the energy efficiency of the UK's housing stock, as well as supporting households that face rising living costs and inflation.[32]

Potential actions include:

- **Create and support partnerships across the industry to leverage scale** to change the dynamics of the retrofit market. An example of how this has been done successfully to date is Pineapple Sustainable Partnerships (see Sidebar: Social housing, and Pineapple Sustainable Partnerships).

Social housing, and Pineapple Sustainable Partnerships

A key component that is essential for the success of upgrading at scale is demand density, or the number of people in a given area that want to upgrade their homes.[1] Social housing represents 16.6% of households in England, and as such, has the potential to generate a consistent need for retrofit skills and services, providing employment opportunities for local communities and residents, contributing to economic growth both at the local and national levels.

Pineapple Sustainable Partnerships is working across the social housing industry to achieve decarbonisation through social housing retrofit, in an impactful partnership between NatWest, Places for People, British Gas, Schneider Electric, Sero and Tallarna. In this way, they can leverage scale to change the supply chain dynamics of the social housing retrofit market and are currently on track to decarbonise thousands of homes in the coming years. In so doing, they are moving the sector towards a just transition to net zero as well as impacting positively on the health and well-being of people and the built environment.

[1] Home is where the heat is, The Sustainable Homes and Buildings Coalition (NatWest Group, Worcester Bosch, British Gas and Shelter), October 2021.

Places for People: Finding a balance between affordability and energy efficiency

With thanks to Branwen Evans, Group Director of Sustainability and Policy at Places for People, who gave time for an interview.

Finding a balance between affordability and energy efficiency in the housing market ultimately means decarbonising homes because that brings real savings.

This is the view of Branwen Evans, Group Director of Sustainability and Policy at Places for People, one of the UK's leading "placemakers". It developed and manages about 240,000 rental homes and has generated social value totalling £272 million so far.

The organisation's main focus is affordable social housing. Tenants in this segment face increasing energy prices. Yet, a big hurdle in the energy conversion process remains that gas is still a cheaper option, making it hard to convince clients to make a shift. A particular problem for Places for People – different from owner-occupiers – is that savings from installing energy efficient measures (still an expensive investment) are realised only by the tenant through lower energy bills. Evans suggests a better model might be a mixed economic one, which captures returns for both investor and customer.

Another challenge is that of obtaining the finance to reach scale. That is why Places for People is looking at a potential collaboration with Pineapple Partnerships, which assists businesses in building partnerships to enable impact at scale.

Nevertheless, there are plenty of examples of what Places for People have managed to achieve. Heat pumps and solar have already been installed in several hundred homes. For example, the group's Environmental, Social and Governance Report 2022 mentions a £3 million grant from the Social Housing Decarbonisation Fund (SHDF) for a large-scale retrofit programme of 223 homes to improve their carbon footprint.

A project in Norwich provided sustainable heating solutions for 18 units housing women fleeing domestic violence in partnership with the international SHIFFT project. Long-term, the aim is to save 40 tonnes of CO_2 a year and to look at a possible wider roll-out.

The ESG report highlights a partnership with Bioregional, Nottingham Trent University and Etude to develop a sustainable business model for social landlords carrying out retrofit projects. The net zero model produced can reduce heating energy demand by 76%, 82% less carbon emissions and £220 average annual savings on customers' energy bills.

The report points out that Places for People expects that future Government requirements will focus on heat pumps. Therefore, the organisation has partnered on a research programme with Purrmetrix and City Science to install temperature sensors for property meter data readings. The aim is to demonstrate and optimise heat pump technologies.

At the end of the day, in the view of Evans, the best results arise from a peer-to-peer transfer of knowledge. For example, a neighbour sees the positive impact on energy bills after their neighbour installs a heat pump. They, in turn, then become a champion for heat pumps.

4 Create a frictionless customer journey

It can be a challenge for individuals and small businesses to implement energy efficiency measures. They often lack clarity on what they can do to make their building more energy efficient (for example, nearly half of UK's adults haven't heard of a heat pump) and are unaware of the benefits. Even if they do want to deploy energy efficiency measures, they are faced with a fragmented and confusing supplier, installer and financer landscape where they lack information, making it hard to know who they can trust and how to co-ordinate energy efficiency upgrades effectively.

Potential actions include:

- **Create a centralised platform** for access to and understanding of existing and future public schemes and advice.
- **Pilot and scale one-stop shops** to provide end-to-end customer support.
- **Provide customer support along all steps of the journey based on the four pillars of consumer protection** – consumer advocacy, advice, redress and regulation (especially for new technologies).

NatWest's Home Energy Hub: An all-in-one solution helping homeowners learn how to increase the energy efficiency of their home, lower emissions and potentially save money

The NatWest Home Energy Hub "One Stop Shop" brings enhanced home energy efficiency awareness, a link to a "reduced cost" trusted partner suite to help get the work done and a range of financial options from NatWest to help spread the cost.

This free online hub brings together the support homeowners need to improve the energy efficiency of their home and is a further development of our Home Energy Plan, launched in December 2022.

The tool is available to both our existing 1.3 million mortgage customers and non-NatWest Group homeowners who want to learn about potential home energy efficiency benefits, access trusted tradespeople to deliver upgrades and find information about finance options, including available grant funding.

The easy process combines a digital journey with in-person support. The first step is to get a free digital Home Energy Plan, which will include an estimated EPC and high-level improvement recommendations.

Users of the hub can book a discounted in-home energy assessment with our partner Vibrant, to receive more detailed retrofit and energy efficiency recommendations. They are then presented with installation pathways with both TrustMark and British Gas, a discounted path to Wickes for customers wishing to do it themselves and links to financing options from NatWest. We have also teamed up with Snugg to offer customers information on Government grants available, based on their postcode.

In our 2023 Climate-related Disclosures Report, Group Chief Executive Officer Paul Thwaite sets out our belief that for households, energy efficiency is the best and most sustainable long-term defence against high energy prices. Our Home Energy Hub enables our customers and UK homeowners to better understand their homes' energy efficiency and provides recommendations to help improve this, reducing energy consumption and helping reduce their carbon footprint.

Our ambition is to be net zero by 2050 across our financed emissions, assets under management and operational value chain. That is why, as part of building capability, we develop integrated platforms that connect advisory and tools to services and finance. The Home Energy Hub is an example of how embracing innovation can help accelerate change. It illustrates how we embed climate considerations into our franchise governance, taking homeowners through their retrofit journey from education and awareness to in-home energy assessment, installation options and finance.

5 Improve supply chain, and increase skills training

Delivering energy efficiency requires an expanded set of skills around design, installation and integration of energy efficient measures. The UK will need to train a new generation of engineers and auditors for energy efficient advice, data technicians for energy efficiency data, and educators to teach green skills to the new and existing workforce.

This starts with investing in education and training programmes. Collaboration is key. Policymakers and industry could support and create systems that encourage sharing of knowledge. Workshops, conferences, mentoring and dedicated online platforms for sharing expertise can break down barriers and speed up learning.

Potential actions include:

- **Map and tackle gaps in energy efficiency and low-carbon training and career pathways,** including mapping and publishing existing training pathways, leveraging existing public and private sector efforts, as well as launching and supporting new training and apprentice schemes.
- **Explore approaches to upskill the current workforce and increase the relevance of energy efficiency in organisations,** including undertaking trials of innovative approaches within businesses for retraining employees, with special focus on micro-SMEs.
- **Ensure current and future investment also addresses skills gaps** through ensuring skill development and transfer when leveraging financial public schemes and co-ordinating investments at a local level to match supply and demand of skills.
- **Provide support across developers and the supply chain for sustainable development.** This could include providing direct training, or funding support, making it more viable and attractive to improve skills.
- **Focus on addressing a skills imbalance across the country,** where rural areas often have a higher proportion of older, energy inefficient homes and also lack enough skilled engineers to improve these older homes.

Supply Chain Sustainability School: Collaboration and innovation for a sustainable built environment

With thanks to Holly Hansen-Maughan, Sector Manager – Retrofit & Construction, who gave time for an interview.

Imagine a built environment where everyone acquires the necessary skills and knowledge to deliver a sustainable future. Such a vision lies at the core of the Supply Chain Sustainability School (SCSS), an award-winning, industry-wide collaboration whose members include over 26,000 companies across the supply chain. Together they create strategic direction and funding for the school to provide free learning resources, training and support. The sharing of knowledge and resources helps construction professionals and organisations to ensure that supply chains in the sector are sustainable and inspire positive change by delivering more efficient and sustainable projects.

Innovative ways of training are required to supply a suitable workforce while enhancing inclusivity and delivering measurable impact. That is why the SCSS provides a compelling model for how industry-led collaboration can help to upskill companies across the supply chain, helping them become more sustainable and contributing to meeting key sustainability goals.

Material, developed in collaboration with the school's partners, includes resources across all skill levels covering eight main topics: Sustainability, Digital, FIR, Lean Construction, Management, Offsite, People and Procurement. The SCSS also offers members the opportunity to attend training workshops and networking events.

To ensure that training is tailored to their specific needs, members can use the confidential Maturity Matrix tool to identify current strengths, as well as competencies that could be developed further, enabling them to upskill in areas that will best enhance their competitiveness and enable growth.

Engagement with the school is recognised and rewarded through bronze, silver and gold membership levels, which organisations can include in tenders, pitches, presentations, email signatures and other marketing materials. Members can also earn continuing professional development (CPD) points by attending workshops and events and by completing e-learning modules.

Since its establishment in 2012, the school has grown rapidly and continues to expand. For example, in June 2023 it introduced the Retrofit topic to help the industry tackle the pressing issue of retrofit at scale across the UK. Retrofitting existing buildings makes them more energy efficient and able to meet energy needs by using less carbon-intensive energy sources. The process can also provide jobs and improve the quality of life of people who live and work in those buildings. Since its launch, more than 1,000 individuals have engaged with this programme.

6 Better explain the potential value added

Both government and businesses can engage more closely with individuals and communities in both cities and rural areas so that landlords, tenants and owners have a clearer understanding of the potential rewards of retrofitting and decarbonisation.

Public understanding is crucial for residents to embrace retrofitting, empowered by knowledge. Residents informed about the benefits can become partners in progress, creating a supportive environment for successful project implementation.

Potential actions include:

- **A public awareness campaign,** with political leaders in collaboration with the private sector, could dispel myths, educate on available technologies and build confidence.
- **Engaging closely with individual consumers, landlords and businesses** to understand their challenges and their suggestions.
- **Ensuring that energy efficiency initiatives are collaborative,** so that residents and occupiers believe energy efficiency is being achieved with them, not done to them.

Hackney's climate change plan showcases collaboration and ambition

With special thanks and gratitude to Mete Coban, Councillor for Stoke Newington, who gave time for an interview.

Hackney Council declared a climate emergency in 2019 and has since planted thousands of trees, installed zero-carbon energy on many of its buildings and improved half of the borough's streets for walking and cycling – and has the highest number of school streets in the country.[33]

Since 2010, emissions from buildings and road transport in Hackney have fallen by about 27%. It is also one of three boroughs in London where traffic has reduced compared to pre-pandemic levels, as a result of the implementation of Low Traffic Neighbourhoods (LTNs) and school streets programmes.[34]

Hackney is part of the UK100 network of councils committed to reaching net zero emissions by 2030 for council office buildings and vehicle fleets as a first step. Its five key themes are adaptation, buildings, transport, consumption and environmental quality. The Council has committed to investing £61 million over three years to reduce its climate impact.

The plan aims to ensure that the transition to net zero is fair for both residents and businesses, in line with the Council's philosophy that any climate action is done in collaboration with citizens.

For example, a pilot residential solar project is aimed at giving council tenants and landlords the option of opting in or out to get discounted energy from rooftop solar on their buildings – a microgrid solution, which also has job creation potential.

As with any ambitious goal, there are challenges. Significant funding is likely to be needed by councils to reach net zero. Another barrier is not having the right regulatory framework to enable councils to take ownership and find more innovative models to work with the private sector around infrastructure investment for energy efficiency. The Hackney Council Climate Action Plan recognises that organisations will have to come together collectively to address the climate crisis which no single body can do on its own.

7 Use public-private partnerships to accelerate delivery

There are buildings energy efficiency measures that could be implemented quickly and deliver significant impact. Many of these have the potential to significantly reduce energy bills, for example, deploying heat pumps in electrically heated homes, retrofitting LED lighting and adjusting boiler temperatures (which could be done during annual boiler servicing).

Potential actions include:

- **Deploy energy efficiency interventions in suitable buildings:** Deploying heat pumps to suitable buildings (with focus on electrically heated buildings and buildings that will replace their boilers); scaling light retrofit measures including LED lighting and adjust boiler flow temperature by leveraging replacement or servicing interventions.
- **Update procurement rules to incentivise sustainable development.** This could include: limiting procurement opportunities to developers that meet energy and climate targets; favouring developers and developments based on sustainability-based metrics; and updating procurement frameworks to include requirements focussed on improving energy and climate impact.

8 Match financial incentives and products to demand

Financial barriers are a big deterrent to efficiency improvements, because of upfront costs and long payback periods. The current lending landscape has limited options for energy efficient retrofitting. This means that often businesses and individuals who want to make their buildings more energy efficient cannot or do not. New models for energy efficiency finance are emerging which address these barriers by, for example, spreading the cost of the investment over a longer period. Scaling models like this could enable more businesses and individuals to act on energy efficiency. Further, more could be done to align the UK tax system with the energy efficiency agenda.

Potential actions include:

- **Explore innovative lending models** to remove financial barriers to efficiency improvements, for example, carbon-linked financing models that reward projects based on their contribution to sustainability goals.
- **Create a "go-to market scalebox" to rollout new and adapted financial products to support energy efficiency,** led by an independent organisation with deep finance expertise, such as the Green Finance Institute, bringing together product providers, data providers and regulators.
- **Explore reforming the tax system to incentivise energy efficiency** in both commercial and residential buildings, across a portfolio of levers that drive demand for energy efficiency.

Green Finance Institute

With thanks to Emma Harvey-Smith, Chief of Staff, and Simon Horner, Director, Strategy and Public Affairs, who gave their time for an interview.

Established in 2019, the Green Finance Institute (GFI) aims to mobilise and channel global capital towards real-economy local green solutions to accelerate the transition to a clean, resilient and sustainable economy. The GFI is jointly funded by the UK government and the City of London Corporation, and occupies a unique position as a neutral third party between the public and private sectors, working with the financial sector and policymakers to co-design innovative financial instruments and develop enabling frameworks, guidance and policy ideas to support green investment at pace and at scale.

Along with its efforts to mobilise funding for green ventures, the GFI also collaborates with key stakeholders within the financial sector to support the growth of green finance within the financial system, as well as supporting knowledge exchange and the building of green financial skills and capabilities.

Within the built environment, the GFI has identified an urgent need to develop and support a suite of financial solutions to help decarbonise homes across the UK. To meet the challenge of improving the energy efficiency of the built environment, the GFI established its flagship coalition, the Coalition for the Energy Efficiency of Buildings (CEEB), in 2019 in collaboration with partners from across the finance, property and energy sectors, as well as from policy, academia and non-profit organisations. The CEEB has developed several financial enablers and solutions to promote the decarbonisation of the built environment, including promoting the further development and scaling of already-existing solutions, such as green mortgages, and champions new innovations like property-linked finance.

Green mortgages are a diverse group of products that aim to incentivise homeowners to invest in improving the energy efficiency of their properties. They represent a rapidly growing market, with banks and building societies across the UK launching green mortgage products at a rapidly increasing rate. However, this growth has been relatively recent – just five years ago, green mortgages were an extremely niche market, with very few products available. To promote the growth of this market, as well as to ensure its integrity and prevent greenwashing, the GFI, in collaboration with the Loan Market Association, launched the Green Home Finance Principles (GHFPs) in September 2020. These aim to provide a framework of guidelines to provide financial institutions with a consistent and transparent methodology for financing retrofitting in domestic buildings in the UK to improve energy efficiency. Twelve organisations now align one or more financial products to the GHFPs, and a further three have committed to align more and more products. Alongside the GHFPs, the GFI has developed a Lender's Handbook to inform mortgage lenders about green home retrofit solutions and technologies, as well as a Broker's Handbook to support mortgage

intermediaries and home buyers in adopting home retrofit solutions. The green mortgage market has since blossomed, with over 60 products available from over 20 lenders.

Research by the GFI has identified property linked finance (PLF) as a financial instrument with the potential to support the decarbonisation of the UK's buildings, both commercial and residential. PLF is a loan linked to a property rather than the property owner and secured against the property, which enables longer repayment terms and lower interest rates, and means that repayment obligations are transferred to the new owner when the property is sold. It can support property owners to fund 100% of the upfront costs of energy efficiency improvements. PLF has been successfully implemented in several countries, particularly the USA, where the PACE model has supported around $10 billion of investment into energy efficiency and resiliency measures. In the UK, PLF could enable between £52 billion and £70 billion of private capital to be mobilised towards upgrading homes. Alongside enabling policies, regulation and technologies, PLF could play an important role in upgrading the built environment in the UK for a more efficient and sustainable future.

NatWest Group's Client retrofit roundtables

In 2023 and 2024, NatWest Group's climate team and colleagues hosted a series of retrofit roundtables in Manchester, Edinburgh and Belfast for customers in the built environment. These customers operate across the build environment: they acquire and lease assets such residential, office, industrial, retail and carry out new build developments.

Themes across the roundtables were consistent. Customers highlighted barriers to retrofitting buildings that included:

- High interest rates that discourage borrowing (especially by SMEs) and thereby prevent retrofit action.
- Other priorities – such as addressing the high cost of living and recovering from the COVID-19 pandemic – took precedence over retrofitting.
- Inconsistent reports from EPC assessors on the same buildings which hamper transition plans for buildings.
- Fragmented supply chains, and the lack of skilled, reliable trades people to carry out retrofits and the sporadic variation of costs makes executing a retrofit difficult and time-consuming.

Despite these barriers, customers continue to pursue retrofitting. The reasons they give include:

- Embracing sustainability is a key driver in improved valuations, and thereby mitigating the risk of standard assets. This is a key driver for action.
- Customers believe that regulation is coming that will push landlords to retrofit properties in both residential and commercial sectors.
- Higher values ("green premium") for sustainable assets are now becoming evident in the market. Non-sustainable buildings are starting to see a drop in value at the point of sale, owing to the capital expenditure needed to improve buildings energy efficiency.
- Lower energy costs for tenants was something that our clients were passionate about addressing. Energy bills are the number one driver for tenants, and keeping these low leads to sustainable rental income. Retrofitting buildings not only increases valuation but also keeps tenants happy and saves them money.

Overall, customers in the built environment demonstrated a clear appetite to improve the energy efficiency of buildings to mitigate the risk of standard assets, protect and increase value and help tenants save money.

4. Conclusion

Energy efficiency is not simply a climate issue, but impacts on jobs, communities and health, too. The research informing this report – as well as conversations with communities, home owners, property renters, and private and commercial landlords – has shown that good intentions for energy efficiency are in place.

Bold action is now needed to match these existing good intentions with a national framework that supports, encourages and incentivises sustainable choices and investment.

This report pinpoints eight opportunities for action to reduce total UK energy demand across domestic and commercial buildings. If followed, these actions could contribute not only to energy efficiency but also to a more prosperous, resilient and sustainable United Kingdom.

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The research process informing this plan involved consultations with more than 220 expert individuals across the public and private sector from close to 150 organisations, seven roundtables with over 200 attendees and drew on research from over 150 expert reports. The key findings, estimates and projections in this Report are based on various industry and other information and are based on assumptions and estimates and the result of market research, and are not statements of historical fact.

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