

Green Heat Finance Taskforce

Report: Part 1

November 2023

Foreword

Human driven climate change is contributing to the warming of our planet. The climate emergency is the greatest long-term threat humanity faces; [the latest Intergovernmental Panel on Climate Change \(IPCC\) report](#) indicates that approximately 50-75% of the global population could be exposed to periods of life-threatening climatic conditions due to extreme heat and humidity by 2100.

The April 2022 IPCC special report on the impacts of global warming states that we need to half greenhouse gas emissions this decade to have a 50% chance of keeping global warming to 1.5°C. Hard and fast emissions cuts are needed across all sectors and nations to hold warming to safe levels.

The effects on Scotland of global warming can be seen in the shifts in our climate; average temperatures are increasing across all seasons, intense heavy rainfall events are increasing in summer and winter, typical winters are becoming milder and wetter. Such shifts are increasingly negatively impacting on the biodiversity of our land and marine ecosystems, our infrastructure and built environments, human health and the economy. The importance of climate mitigation and adaptation to the future of Scotland and its people cannot be underestimated.

Heat in buildings plays a substantial role in the creation of our carbon footprint and so must play a significant part in our transition away from fossil fuels. Carbon emissions from heat generation in Scotland's homes accounted for 15% of our total greenhouse gas emissions in 2021 and approximately 30% of Scotland's total energy consumption¹. Non-domestic (commercial) buildings made up 7% of our total greenhouse gas emissions in 2021 and 15% of final energy consumption for 2020².

The decarbonisation of heat in Scotland's buildings is a vital step in the Scottish Government's programme to ensure that Scotland achieves Net Zero emissions of all greenhouse gases by 2045, in line with our Climate Change Plan and legislation.

This is a huge challenge, especially in the context of the current cost of living crisis, and it is recognised that such a change to our buildings will require a mixture of public and private financing in various combinations to ensure that this transition is affordable for all. A just transition to Zero Direct Emissions Heating (ZDEH) along with the necessary energy efficiency improvements to ensure ZDEH solutions work efficiently, will also deliver improvements in health outcomes as homes will be warmer, greener and more efficient. The transition will also support environmental recovery and sustainable economic growth.

The work to develop finance options to support the transition to ZDEH is not happening in isolation, but is part of the Scottish Government's delivery of its [Heat In Buildings Strategy](#), which focuses in on all areas of the journey to ZDEH, including the skills and supply chain, advice and quality assured installation.

¹ For heat consumption: [Non-electrical heat consumption by sector](#)
For total energy consumption: [Total final energy consumption by consuming sector](#)

² As above

This Green Heat Finance Taskforce was established in response to a commitment in the Strategy, with the Taskforce asked to explore and report on the opportunity to secure private finance, including identifying potential products and the commercial drivers and barriers affecting the flow of finance into the retrofit of energy efficiency and ZDEH measures.

We would like to thank our fellow Taskforce members for their valuable contributions, support and expertise in this task and in the development of this report. This is the first of two reports from the Taskforce, with this report focusing on financing options for individual properties, while our final report will focus on mechanisms impacting multiple properties. We look forward to continuing to work with the Taskforce as it completes its work on this vital subject area, which will have implications for all domestic and non-domestic properties over the coming years.

A handwritten signature in black ink, appearing to read "Patrick Harvie".

Patrick Harvie, Minister for Zero Carbon Buildings, Active Travel and Tenants' Rights

A handwritten signature in black ink, appearing to read "Sara Thiam".

Sara Thiam, Chief Executive, Prosper (Trading name of Scottish Council for Development and Industry)

Co-Chairs of the Green Heat Finance Taskforce

Contents

1. Executive Summary.....	6
2. Zero Direct Emissions Heating; Finance For Individuals.....	10
2.1 Introduction.....	10
2.2 Green mortgage (secured loan) illustrative example.....	11
2.3 Equity Release Illustrative Example.....	12
2.4 Small Business Illustrative Example.....	13
3. Strategic Context and Background.....	14
3.1 Characteristics of Scotland’s domestic and non-domestic buildings.....	14
3.2 Policy Context.....	14
3.3 Green Heat Finance Taskforce.....	16
3.4 Key Themes.....	18
3.5 Market Pillars.....	18
3.6 Regulations.....	20
3.7 Co-Investment.....	20
4. Finance context and constraints.....	25
4.1 Financing supply context and influences.....	25
4.1.1 Overarching Macro-Economic Drivers.....	25
4.1.2 Changes Within the Lending Market.....	26
4.1.3 Green Taxonomy.....	26
4.1.4 Other Influences from Government and Other Markets.....	26
4.1.5 Challenges constraining financial sector provision of finance.....	27
4.2 Finance demand constraints and challenges.....	28
4.2.1 Complexity of Making the Right Choice.....	28
4.2.2 Perceived Impact on Property Value.....	29
4.2.3 Poor financial returns.....	29
4.2.4 Split Incentives.....	30
4.2.5 Lack of Promotion of Green Mortgage Products.....	31
4.2.6 Legislative barriers.....	32
4.2.7 Quality of Data.....	32
5. Overview of Current Market Financing Options.....	34
5.1 Summary of possible financing options (descriptions of each product below can be found in Annex 2).....	35
5.2 Traditional Self-Financing (including unsecured loans).....	41
5.3 Taskforce View on Current Use and Potential Development.....	42
5.4 Green Loans or mortgages (secured lending).....	44
5.4.1 Taskforce View on Current Use and Potential Development.....	45

5.5	Equity Release Mechanisms	48
5.5.1	Taskforce View on Current Use and Potential development	49
5.6	Green Leases or Rental Agreements	49
5.7	Property Linked Finance.....	50
5.8	Fiscal Incentives	51
6.	Conclusions and Recommendations	52
6.1	Fostering Market Development	52
6.2	Recommendations.....	52
6.3	Recommendations and How They Address the Identified Challenges.....	55
7.	NEXT STEPS	64
8.	ANNEX 1 – Taskforce Membership	65
	Green Finance Institute (GFI)	66
	ANNEX 2 – Potential Finance Mechanisms	69
9.	ANNEX 3: Market Structure Overview	85
9.1	Domestic Buildings	85
9.2	Non-domestic buildings	88
10.	ANNEX 4 – Rationale for government involvement and summary of Existing Scottish Government Initiatives	93
10.1	Rationale for government intervention	93
10.2	Existing Support	93
11.	ANNEX 5 - Wider explanation of the market pillars	97
12.	ANNEX 6 – Glossary	103

1. Executive Summary

The £1.8 billion of capital funding for heat and energy efficiency measures that the Scottish Government is investing in this Parliamentary term will provide stimulus to energy efficiency and Zero Direct Emissions Heating (ZDEH) deployment. However, according to the Scottish Government's 2021 Heat in Buildings Strategy, the total cost to transition heating to Net Zero by 2045 is likely to be in excess of £33 billion. We recognise that this cost cannot be funded by the public purse alone.

Recognising that the transformation of heat in buildings will require a mix of public and private funding, this Taskforce was established with a remit to:

- explore options for the scaling up of existing financial mechanisms;
- identify potential new financial products where there are market gaps;
- identify other mechanisms / services that may support the market to decarbonise heat sources in buildings; and
- consider potential demonstrators to pilot in the marketplace.

Scotland has around 2.5 million homes, of which over 63% are owner occupied, approximately 14% are in the private rented sector and 23% are socially rented³. Many were built over 50 years ago using traditional building methods, such as solid wall construction, which can create challenges for improving energy efficiency performance. Approximately 80% of homes are connected to mains gas and are therefore currently heated by fossil fuel burning, although most off-gas properties also use a form of fossil fuels as a primary heat source.

On the other hand, roughly 50% of our 200,000 business premises already have electricity as their main heating fuel. However, poor energy efficiency levels in non-domestic buildings are a major factor leading to high energy demand, something which is costly for the bill payer and stretches capacity in the energy market. Unlike domestic properties, where the majority of buildings are owner occupied, a greater proportion of properties in the commercial sector are occupied through various forms of leasing, meaning a one size fits all solution is unlikely.

Such variety of ownership and energy performance levels, coupled with building owners' individual financial circumstances, necessitate the need for a suite of possible finance options across both domestic and non-domestic premises to ensure that all can transition to ZDEH by 2045.

This Taskforce's work has been focused on understanding those finance mechanisms that can support the retrofit of homes and buildings by helping individuals, businesses and organisations spread the upfront cost of installing energy efficiency measures and ZDEH systems, such as heat pumps. The Taskforce recommendations therefore aim to help address some of the existing financing barriers to installing ZDEH or energy efficiency upgrades.

³ [Supporting documents - Scottish House Condition Survey: 2021 Key Findings - gov.scot \(www.gov.scot\)](https://www.gov.scot/supporting-documents/scottish-house-condition-survey-2021-key-findings)

However, having financing solutions in place and at scale, is just one of the many different moving parts that will be needed to ensure that this transformational change in how heat is generated in our buildings is delivered successfully. This report therefore also highlights the importance of wider measures in creating the overall conditions required for an energy efficiency and ZDEH market to flourish, with demand stimulation being a particularly critical factor, as highlighted by many private sector lenders.

Work is underway elsewhere on issues like regulation to help stimulate demand, and on developing a workforce and supply chain with the right skills and capacity to deliver the physical upgrades required. Work and public engagement is also underway separately through the Scottish Government around a Just Transition, which ensures a fair distribution of the costs and benefits associated with the transition to Net Zero. We have therefore taken into consideration the detail of those issues beyond the remit of the Taskforce, while focusing on the specific issues and questions related to financing. However, it is vital that the importance of these wider issues is not overlooked and that coordinated efforts to drive action across all of these key themes is redoubled at both Scottish and UK Government levels.

In this report we recognise the overall key themes that foster the growth of both the demand for and supply of finance in the energy efficiency and ZDEH markets:

- the necessity that all aspects of the market are developed in alignment with finance offerings (market pillars);
- the need for Regulations to provide clarity around future building requirements, as well as incentives to encourage action and give confidence for providers to invest in products and skills; and
- the scope for co-investment models to leverage public sector funding to support market development and attract / de-risk early market private financing.

The Taskforce has, and continues to, examine the current status and potential growth opportunities for a range of financial mechanisms that contribute to energy efficiency and ZDEH installations across both domestic and non-domestic markets. This report focuses on the mechanisms which, in the Taskforce's view, are most suitable for individual properties, while our Part 2 Report will focus on mechanisms that can apply across multiple properties (Annex 2 provides a table outlining mechanisms for individual and multiple properties).

The products discussed in this report, and which private lenders are doing significant work to develop and test, are:

- Personal loans;
- Green mortgages;
- Equity release mechanisms;
- Green leases/rental agreements; and
- Property Linked Finance.

Additionally, we highlight the role that public finance and fiscal incentives could play in supporting the market to create the requisite demand and supply.

The Taskforce is aware, however, that there are serious barriers to completing retrofit works. We recognise that key amongst them are the complexity for consumers in identifying the right technology and financing option for their property, and the nervousness many people have about physical disruption that may occur while the works are underway, as well as concerns that property value enhancement from installation of new heating systems may not be fully reflective of installation costs.

For domestic and non-domestic landlords there is also the issue of split incentives, where the owner of the property incurs the costs of work, while the tenant gains the benefits of more comfortable and energy efficient properties. Underpinning this are issues of quality of data on energy efficiency levels, energy consumption and heating sources, particularly for non-domestic buildings. This is relevant for investors and finance providers trying to gauge risk levels for products they may offer. It also impacts on the monitoring and tracking of progress of the impact different initiatives can have on achieving overall carbon reduction targets.

Taking the current state of the energy efficiency and ZDEH market in Scotland into account, along with the barriers we discuss, and reflecting on the opportunities for growth that exist, the Taskforce makes nine recommendations in this report. We believe that the Scottish Government, in partnership with private sector organisations and other levels of government, can help unlock an increased flow of private finance across various mechanisms by taking action on these recommendations. This will be required alongside a wider programme of action around non-financial factors such as skills or advice provision around the correct solution for an individual property.

Collectively, these will enable individual property owners to install energy efficiency and ZDEH measures. Our recommendations, which are discussed alongside our thinking behind each in Chapter 6, are –

1. Scottish Government, from early 2024, should work with the Green Finance Institute, Scottish Financial Enterprise and others to expand current market engagement with brokers, finance providers, distributors and quantity surveyors to generate greater public awareness of financing products like green mortgages and encourage their expansion;
2. Scottish Government should begin work, from early 2024, in partnership with the Equity Release Council, to develop an information framework and guidance for Green Retrofit Equity Release products;
3. Scottish Government should research co-investment vehicles – blended finance with public and private input – with the support of the Scottish National Investment Bank, Scottish Financial Enterprise and Scottish Futures Trust, to identify by the end of 2024 where and how to test the approach in Scotland;
4. Scottish Government should collaborate with the Green Finance Institute to research the potential for Property Linked Financing in Scotland, with a view to establishing a scalable demonstrator by May 2025;
5. Scottish Government should review and publish, by the end of 2024, the potential of incentivising domestic property owners to increase levels of retrofit works through fiscal and taxation policy;

6. Scottish Government should review and publish, by the end of 2024, analysis of how non-domestic rates reliefs can better support and encourage investment in energy efficiency and ZDEH;
7. Scottish Government should seek to mitigate the split incentive issue by researching and piloting, by early 2025, the potential for green rental agreements, to encourage retrofitting in rented properties;
8. Scottish Government should immediately engage the UK Government and regulators to drive action on ZDEH and energy efficiency deployment, and support coordination of activities between parties; and
9. Scottish Government should, by mid-2024, map current heat in building data gaps and establish a framework to promote open data sharing to address these.

In our Part 2 Report, the Taskforce will focus upon communal and area-based mechanisms, including district heating networks, municipal bonds and heat as a service. We believe that broader area-based schemes have a potentially important role in achieving overall ZDEH targets, as they may be required for many properties where individual owners lack the capacity and / or willingness to fund individual solutions by drawing on the financing options available. Communal solutions, though, will not serve everyone, so individual financing options, as focused on in this report, will be important for early adopters and to complement area-based solutions.

Our Part 2 Report will also consider options for the social housing sector; its specific challenges and possible solutions. The Taskforce will consider where mechanisms discussed in this report, like co-financing, may interact with the topics we explore as we continue our work over the coming months.

We recognise that we do not have all the answers and so we would welcome any feedback, views or good practice examples you may have on the issues discussed in this report. Please get in touch via the following email address should you wish to discuss further: greenheatfinancetaskforce@gov.scot .

2. Zero Direct Emissions Heating; Finance For Individuals

2.1 Introduction

Human activity is driving changes to the Earth's climate, which will have both international and local impacts through increased instances of extreme weather, more devastating wildfires and greater examples of flash flooding, amongst other changes. Climate change will affect people's everyday lives and the operation of businesses, through issues like food chain disruption and wider supply chain bottlenecks, while, at a global level, there is a heightened risk of conflict over scarce resources like water and the displacement of people as a result of weather-related emergencies.

That is why it is vital that action is taken to reduce and end the harmful climate impact of human activity by reducing carbon emissions and supporting measures to enable natural habitats to recover. Through a combination of reaching Net Zero emissions and fostering diversity within the natural environment, we will be able to limit the increases in global temperatures and prevent the worst case climate scenarios becoming our reality. As many respected commentators have said, this is fundamental to protecting the planet and quality of life for current and future generations.

Like many people, this Taskforce realises that addressing this global challenge is one of the most complex challenges humankind has faced. It will require leadership, commitment and collective efforts right across the world. We are not experts offering prescriptions for how to solve the overall climate challenge. However, we do believe that there are steps we can all take, and changes in behaviour we will need to make, as part of wider efforts to reduce emissions and ensure a sustainable future planet.

One of the areas touching all individuals and businesses that will need to transition to Net Zero emissions over the next two decades is that of energy use, and, in particular, how we heat our homes and buildings. In 2021, space heating (including fireplaces) and water heating together accounted for 95% of Scotland's domestic emissions. For non-domestic emissions (heating and cooling) it is 82%⁴. Transitioning to ZDEH can therefore make a significant contribution to reaching Scotland's target to reach Net Zero emissions by 2045.

Complementary to decarbonising heating systems is improving the energy efficiency of buildings, so that they require less energy to heat and keep warm. This will help people live healthier lives by preventing illnesses caused by things like damp living conditions as a result of poorly insulated buildings. This will generate wider impacts in terms of reduced demand on healthcare, as well as supporting increased productivity and economic activity through less days lost to sickness.

The focus of this Taskforce has been on one aspect of supporting a transition to ZDEH systems, that is, identifying how individuals and businesses can or could finance the work needed as we move away from heating by means of fossil fuels. The main body of this report focuses on explaining what the current structure of

⁴ [Supporting documents - Scottish Greenhouse Gas Statistics 2021 - gov.scot \(www.gov.scot\)](https://www.gov.scot/resources/documents/2022/04/Supporting_documents_-_Scottish_Greenhouse_Gas_Statistics_2021_-_gov.scot)

heating is across Scotland's buildings, setting out the state of the private financing market for energy retrofitting measures, and proposing a set of recommendations that can help unlock deployment of private finance at scale.

The report discusses ZDEH and energy efficiency in combination, something that may be termed as green heat. ZDEH relates to the heating system in a property and means heating by means of a non-fossil fuel source, generally some form of electric heating, as this will become increasingly zero emissions as renewables account for greater proportions of overall generation. However, conversion of all properties to ZDEH will take time, including for heat networks to be built to connect some. This means increasing energy efficiency across all properties is also important, both in terms of reducing overall emissions and in helping consumers lower their energy bills, as energy efficiency measures can make a big impact on the level of energy a property uses.

Before delving into the detail of the report, however, we believe it would be helpful to set out some illustrative examples of how individuals are currently able to finance the installation of ZDEH systems and improve energy efficiency of their properties. These examples serve to demonstrate how different, currently small scale financial products, can be combined with existing financial support available from the Scottish Government and used to install ZDEH solutions.

For clarity, these are illustrative examples and do not provide financial or investment advice. Individuals considering different financing options for any planned upgrades to their property should seek professional financial planning advice as necessary.

2.2 Green mortgage (secured loan) illustrative example

Mr and Mrs Henderson are in their early 40s and own a 1930s semi-detached house in an urban area in which they have a mortgage. The house has a pre-1998 standard gas boiler and double glazing which is over 20 years old.

The Hendersons contacted Home Energy Scotland for free and impartial advice on how to make their home more energy efficient. They received a tailored report and a home visit by an adviser, following which they decided to replace their gas boiler with an air source heat pump, and to replace their old double glazing with new triple glazed windows.

The Hendersons contacted their mortgage providers and received confirmation that they were eligible for a green home loan of up to £25,000 on a five year fixed rate. They then sought quotes from accredited installers through the Micro Certification Scheme and selected a preferred supplier for both heat pump and windows. The combined total of work for their house came to an estimated £20,000.

With quotes for the work, and having consulted a financial adviser, the Hendersons then completed application forms for Home Energy Scotland's grant and loan scheme, applying for the maximum grant of £7,500 and maximum interest free loan of £7,500, which was to be paid back over 10 years. They also completed an application for a £5,000 green home loan from their mortgage provider.

Once Mr and Mrs Henderson had confirmation of grant funding, and both the Home Energy Scotland loan and the green loan from their bank, they booked the installation of a heat pump and new windows.

Mr and Mrs Henderson now make a monthly payment of £65 to Home Energy Scotland, which they will do for 10 years. In addition, their mortgage repayment increased by an extra £32 monthly, which they will pay back over the remaining lifetime of the mortgage.

The combined impact of these upgrades substantially reduced the Hendersons energy consumption, reducing their CO² footprint and giving them a more consistently heated home.

2.3 Equity Release Illustrative Example

The Hendersons' neighbour, Judith, is also interested in improving the energy efficiency of her home. Judith is in her late 50s and owns her house outright, having paid off the mortgage following the death of her wife a few years ago.

Judith contacted Home Energy Scotland for free advice about the home improvements that were most suitable for her property. Upon receipt of her tailored report, Judith decided to invest in solid wall insulation and a solar water heating solution. She decided a heat pump was not the right solution for her at the current time, as she installed a new gas boiler last year, although she is aware that she will need to convert to a zero emission heating solution at a later date.

Having sought quotes from accredited solar installers (via the Micro Certification Scheme) and explored sources of financing available, Judith identified the work would cost £15,000 and that she was eligible for a £7,500 grant from Home Energy Scotland's grant and loan scheme.

As Judith was hoping to reduce her working hours in a few years' time, she was not keen on taking out a loan to finance the remaining work.

After researching alternative options on a trusted comparison website and taking advice from a qualified financial adviser, Judith decided to raise the necessary financing through an equity release product known as a Home Reversion Plan. Through the Home Reversion Plan she sold a 10% equity stake in her house, for less than the market value of the stake, with the equity release finance provider to receive repayment when Judith's house is sold.

The impact of the upgrades to Judith's home are that it is warmer throughout the house, particularly in winter, and she is able to make sizable savings on energy bills. Combined with not having to make any monthly repayments, as the financing raised through selling an equity stake is not repaid until the house is sold, Judith also feels more confident that she will be able to continue to afford to live in her house when she reduces her work to three days a week when she reaches the age of 60.

2.4 Small Business Illustrative Example

‘Stylish Lines Joinery’ is a small company with a healthy order book, although the increase in input costs over recent years has squeezed margins and made the business owners decide it is important that they eliminate unnecessary ongoing costs from their business.

Over the years the business has expanded and the owners, Adam and Kaye, sought new premises to accommodate their growing needs. They purchased a unit in nearby industrial premises, with the aim of bringing the showroom, workshop and warehouse under one roof. The existing heating and lighting systems in this property were poor and in need of an immediate upgrade.

The owners approached their bank to enquire about financing options, having received marketing material about Green Business Loans from the bank. Following initial discussions with their bank, and based on information provided, the owners also contacted Business Energy Scotland (BES) to request an assessment of their requirements. An independent assessment was carried out and the report stated that the key focus areas to consider for energy savings were as follows –

- Glazing
- Insulation
- Lighting
- Heating

With steeply rising energy costs, the owners were keen to consider the recommended projects and carry out the necessary installations. The overall cost estimate for the four projects was £150,000. Having established that this business was eligible for an interest-free small and medium-sized enterprise (SME) loan of £100,000, and, upon conducting the mandatory credit assessments, BES was willing to offer the loan to carry out the necessary energy improvements.

The owners then turned to their existing bank to explore the financing options for the £50,000 shortfall they faced to cover their overall projected expenses. As they already had a relationship with the bank, the owners were able to quickly and easily agree a sustainability-linked loan of £30,000 and asset finance for £20,000 worth of centralised heating equipment. The owners were extremely pleased because they were keen to implement their projects and be energy efficient as soon as possible.

The optimal mix of financing from the Scottish Government and a commercial bank helped the business realise its energy efficiency goals. The business now estimates it will reduce its carbon footprint by over 15 tonnes annually, while saving over £16,000 on energy bills. The expert advice and support available from both the public and private sectors proved invaluable in helping Adam and Kaye to realise their business aspirations and meet their environmental goals (whilst also helping them market the business’ sustainability credentials). Both the £100,000 SME Loan and commercial loans will be repaid monthly over a 10 year period.

3. Strategic Context and Background

3.1 Characteristics of Scotland's domestic and non-domestic buildings

There are over 2.5 million domestic properties in Scotland, with almost 1.6 million being owner occupied homes, over 360,000 in the private rented sector, and nearly 580,000 which are social housing. Over 1.3 million of these properties have an EPC energy efficiency rating of C or better, while around 325,000 have EPC ratings of E or lower. Social housing as a sector, though, does have a better overall energy efficiency rating than that of other domestic property types, 65% of social housing having an EPC rating of C or better, compared to 52% for all domestic buildings.

Mains gas remains the principal source of heating for the vast majority of domestic properties, with 81% of homes heated by gas, compared to just 11% for the electricity, which is the second most popular source, followed by smaller contributions from sources like oil or communal heating.

The predominance of gas as a primary heating source highlights the scale of challenge involved with converting the existing building stock to ZDEH, the cost of which is estimated as in excess of £22 billion, with a further £5 billion required to support energy efficiency upgrades. The overall costs estimates are aggregated across all property types, and will, therefore, mask the variation that will exist between individual properties, where factors like property age, size and location all have an influence on both the most appropriate technical solutions and the costs.

The number of non-domestic buildings in Scotland is much smaller, being around 230,000. They are, however, of varying sizes, from very small (public toilets for example) to very large (hospitals) and the data available on their current energy efficiency levels and typical costs for retrofitting individual properties is limited. Indications are, though, that energy efficiency is very poor across non-domestic buildings with 85% of those with an EPC rated as D or lower.

We do, however, know though that the majority of non-domestic properties are heated by electricity (59%) suggesting that improvements in energy efficiency are at least as important as converting to ZDEH as a way to maximise non-domestic buildings' contribution to Scotland's Net Zero goals. As the total floor space varies across (and within) sectors – while the sectors with the greatest floor space do not necessarily align with the sectors that have the most properties – there are a range of challenges for policy makers to wrestle with when planning how best to encourage action to convert non-domestic properties to ZDEH and to undertake relevant energy efficiency retrofitting work.

Annex 3 provides a more detailed discussion of the characteristics of the current domestic and non-domestic building stock from a heating perspective, based on the data available.

3.2 Policy Context

In 2019 Scotland declared a Climate Emergency and enacted the [Climate Change \(Emissions Reduction Targets\) \(Scotland\) Act 2019](#), committing Scotland to Net Zero

emissions by 2045, with interim statutory targets of a 75% overall emissions reduction by 2030 and by 90% by 2040. The update to the Climate Change Plan, published in December 2020, committed to a reduction in emissions from both homes and non-domestic buildings of 68% by 2030 compared to 2020 levels⁵.

The Scottish Government set out its plan for reducing emissions from homes and non-domestic buildings in its Heat in Buildings (HiB) Strategy including the role of different technologies such as heat pumps and heat networks. This strategy recognises that not all actions in support of emissions reductions in homes and buildings can be delivered by the Scottish Government alone, with some regulatory and policy levers remaining reserved to the UK Government. For example, the reformation of gas and electricity markets is needed, including with respect to current higher costs for electricity relative to gas, to align Net Zero emissions goals with ambitions to end the use of fossil fuels such as gas to heat buildings. Decisions on the future role of hydrogen and the gas network are also required at a UK level⁶.

In the HiB Strategy the Scottish Government committed to:

- improve the energy efficiency of buildings, so as to reduce heat demand, and to remove fossil fuels heat generation by supporting renewable heat technologies, such as heat pumps, heat networks and hydro-electric technologies;
- work with local government to put in place Local Heat and Energy Efficiency Strategies (LHEES); and
- continue to provide stimulus to the heat and energy efficiency sector through £1.8 billion of funding and financing in the current Parliamentary session to:
 - generate opportunities across Scotland through delivery programmes that will support local jobs and create opportunities for young people;
 - expand work with the supply chain, including the co-creation with industry of a Supply Chain Delivery Plan; and
 - bring forward Regulations setting standards for property owners across all tenures and building types.

Underpinning this national strategy is the development of LHEES, which will help to guide the rollout of measures, as well as inform the designation of heat network zones. All local authorities are legally required to produce a strategy for heat transition in their local catchment area by the end of 2023. These strategies will include how each segment of the building stock needs to be upgraded to meet national and local targets on ZDEH, as well as measures relating to the removal of poor energy efficiency as a driver of fuel poverty. Additionally, they will identify heat decarbonisation zones, highlighting the primary opportunities for emission reduction in each zone.

This Taskforce's work has been focused on achieving a better understanding of the finance mechanisms that could support the retrofit of homes and buildings by helping individuals, businesses and organisations spread the upfront cost of installing energy efficiency measures and ZDEH systems. The Taskforce has also made recommendations that identify options that could help address some of the existing

⁵ For more details, please see the Update to the Climate Change Plan: [Update to the Climate Change Plan 2018 - 2032: Securing a Green Recovery on a Path to Net Zero \(www.gov.scot\)](https://www.gov.scot/publications/update-to-the-climate-change-plan-2018-2032-securing-a-green-recovery-on-a-path-to-net-zero/pages/10_to_12.aspx)

⁶ Please see chapter 10 of the Heat in Buildings Strategy for more detail on non-devolved area of energy policy.

barriers to installing ZDEH. These barriers must be addressed alongside challenges within the financial sector itself to help ensure the continued growth in the range and scale of finance mechanisms necessary (picked up in more detail in Chapter 4).

However, while acknowledging that the Scottish Government has ambitious targets in place to reduce emissions from buildings, the Climate Change Committee is concerned that policies are not yet in place to support the rapid deployment of energy efficiency and low carbon heating necessary to be able to achieve these targets⁷. This situation could act as a break in the development of the market place as it may impact on demand generation. The Taskforce understands that the Scottish Government plans to introduce a Heat in Buildings Bill during the current Parliamentary session to help underpin and drive delivery of ZDEH. Alongside this, the Scottish Government is reviewing and developing proposals to reform Energy Performance Certificates⁸. The Taskforce considers these steps important aspects of creating a long-term and certain environment, helping to de-risk investment in the finance sector and allowing for new products to be brought to market.

The Taskforce will work with and feed into a range of existing collaborative fora that exist between the finance sector and the Scottish Government, including the Financial Services Growth and Development Board (FISGAD) and its sub-groups, as well as the Scottish Government's Net Zero Investor Panel, which is co-chaired by the First Minister. The latter was established in December 2022 to advise on how Scotland can create the right conditions to attract global capital to develop the physical infrastructure required for a just transition to Net Zero⁹. There are common areas of interest for this Taskforce and the Panel, for example, considering how to attract capital at scale to support a just transition of Scotland's buildings.

3.3 Green Heat Finance Taskforce

The Green Heat Finance Taskforce (GHFT) was established in February 2022, following a commitment in the HiB Strategy, with a remit to explore and report on:

- Alternative financing – setting out sources of funding and finance for heat decarbonisation, including for existing and new technologies to meet medium and longer term requirements.
- Market demonstrators – opportunities to pilot value-for-money and innovative financial mechanisms to unlock individual and community level investment.
- Ongoing engagement on financial products – catalysing constructive longer term relationships and partnerships between the public sector, the heat sector, industry, wider supply chains, building owners and financial institutions.
- Strategic alignment – support balancing the needs of heat decarbonisation with the requirements for private investment activity across the wider energy system to deliver broad socio-economic benefits.

This is in response to the significant funding and financing gaps that exist, and the challenge of attracting private investment into the heat in buildings transition. The estimated gross cost of achieving ZDEH, including energy efficiency improvements

⁷ [Scottish Emission Targets & Progress in reducing emissions in Scotland – 2022 Report to Parliament](#),

⁸ [Energy Performance Certificate Reform Consultation - Scottish Government - Citizen Space](#)

⁹ [Net zero: Investor Panel - gov.scot \(www.gov.scot\)](#)

to reduce heat demand, are significant. The Scottish Government has estimated this as being in the region of £33 billion, based on prices in 2021¹⁰. Capital funding from the Scottish Government for heat and energy efficiency improvements over the current Parliamentary session to 2026, is £1.8 billion, including specific support for those least able to pay, as well as funding to support infrastructure development¹¹.

Bridging the financing gap between committed Scottish Government funding and the total financing required will be challenging. The right mix of measures, including market signals and delivery mechanisms, will need to be in place to help create customer demand for (and straightforward access to) ZDEH and energy efficiency measures, as well as help de-risk private investment and reduce the cost of finance. There will be a need to scale up and flex existing products, as well as innovate to develop new financial products to help spread the upfront costs of retrofitting homes and buildings.

The Scottish Government will need to strike the right balance between providing direct funding support and fostering increased private finance, and will, therefore, need to determine which segments of society and which building types need higher subsidy levels to make retrofit cost-effective and ensure the overall transition of heat in buildings is fair and just. In making these determinations the Scottish Government should look in particular at where and how the public funding available could be used to leverage additional private investment, and, therefore, increase the overall reach of the funding. How to effectively incentivise groups less able to draw on direct Scottish Government funding will also be vital to a successful transition to ZDEH.

The GHFT has been co-chaired by the Minister for Zero Carbon Buildings, Active Travel and Tenants Rights, alongside Sara Thiam, Chief Executive of SCDI¹². This Part 1 Report primarily covers the Taskforce's conclusions around options to grow private sector financial support for individual building owners. It identifies the key barriers which currently constrain the provision and/or uptake of products to finance private investment in ZDEH solutions, and enhancing the energy efficiency of buildings. It considers both domestic and non-domestic buildings, with Annex 2 outlining the range of existing financing being provided by the Scottish Government.

A range of mechanisms will be required to allow people to access the option which is most appropriate to their individual circumstances, and we expect individual and communal approaches to work in tandem. The Taskforce's Part 2 Report will therefore cover financing of communal approaches to both ZDEH generation and energy efficiency, taking into account options for social housing, area-based approaches and heat networks. These mechanisms are largely focussed on larger scale financing, such as regional and neighbourhood financing of Net Zero improvements across multiple buildings, and should provide alternative mechanisms that complement financing which may be secured by individual building owners.

¹⁰ [Supporting documents - Heat in Buildings Strategy - achieving net zero emissions in Scotland's buildings - gov.scot \(www.gov.scot\)](https://www.gov.scot/buildings-strategy)

¹¹ This Parliamentary session runs for five years from May 2021.

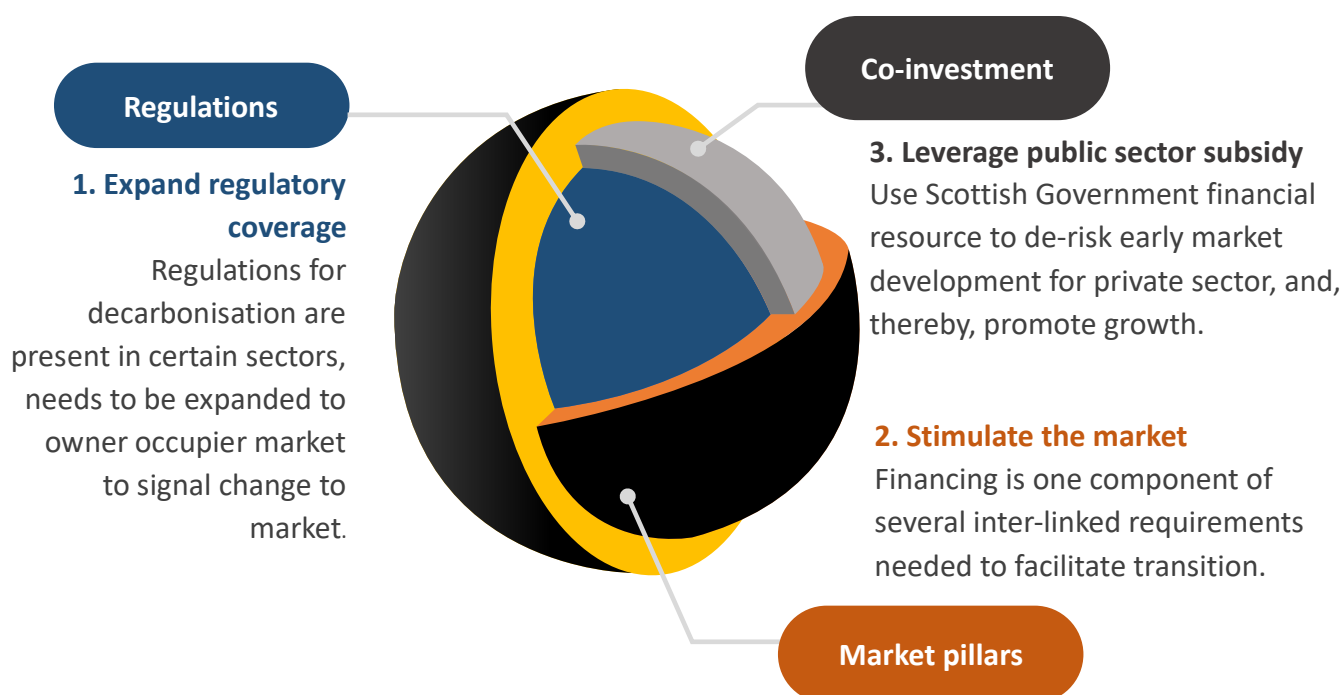
¹² Please find the [Terms of Reference and membership of the Taskforce here](#).

3.4 Key Themes

To foster an effective and efficient green finance market capable of funding the transition to ZDEH with associated energy efficiency improvements, we have identified three key themes impacting on financing and which are aligned with and support the needs articulated by the HiB Strategy. These themes are –

- Market pillars – recognise the flow of finance needs to be considered holistically and is dependent upon sufficient demand, as finance is one of many inter-linking factors that give providers confidence to offer finance and customers assurance they are making the best decision for their circumstances.
- Regulations – which, alongside incentives to encourage actions, can have a positive impact by providing clarity around future building requirements and give confidence for providers to invest in products and skills.
- Co-investment – acknowledges the potential benefits from being able to pool funding, share expertise and de-risk potential private investment, thus delivering more in partnership than any one party can do individually.

Figure 3-1 Key underpinning themes to support effective market in green financial products



3.5 Market Pillars

Encouraging development of robust market pillars will create an overarching framework to both structure the market and grow the number of participants. While many of the features that could be considered market pillars are not explicitly financial, and are therefore not directly within the scope for this Taskforce, we argue that failure to consider these factors has implications for the ability of finance to flow effectively. Without aligning action to support key market pillars, there will be less demand for financing and a lower supply of private finance.

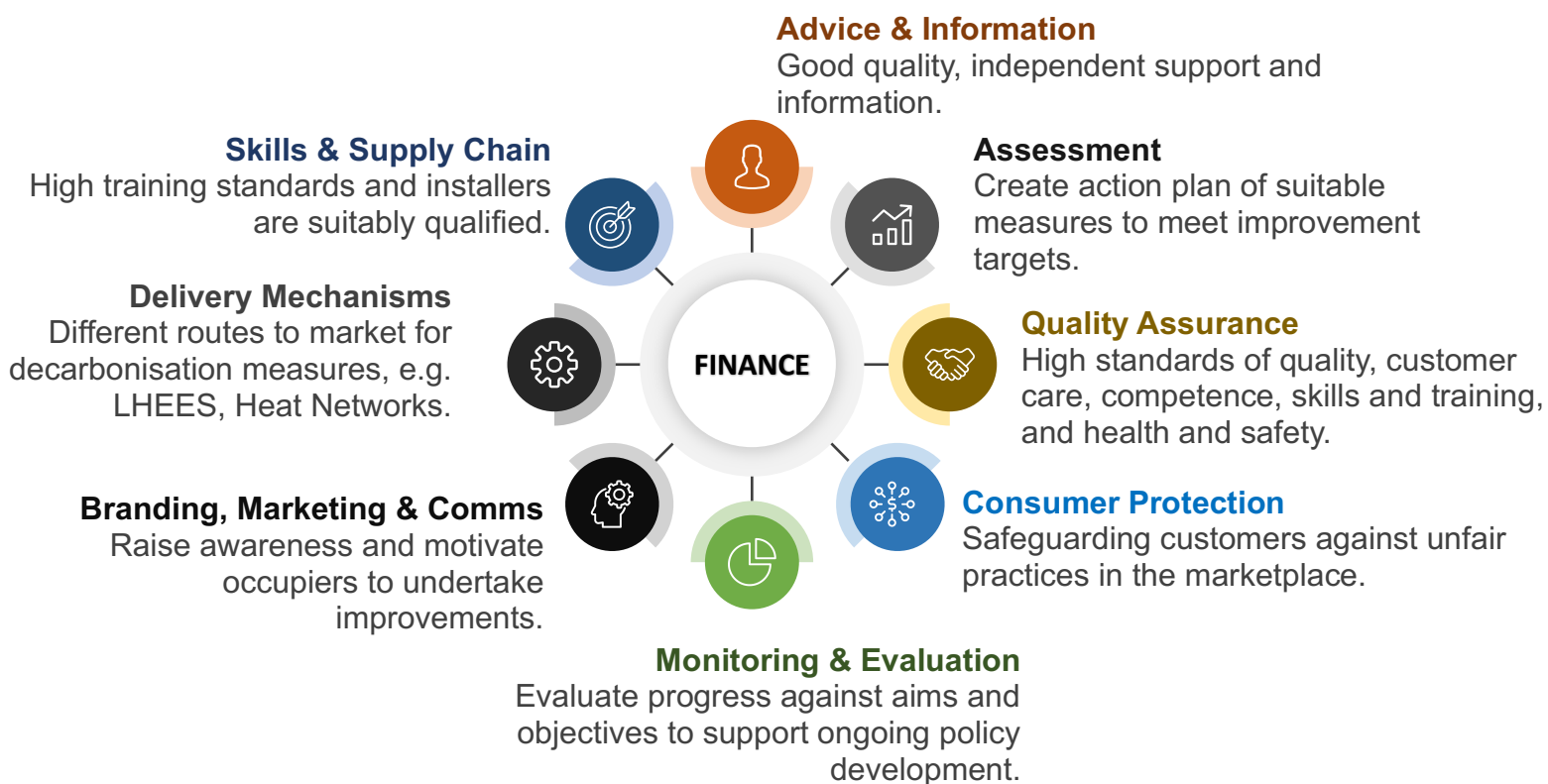


Figure 3-2 Summary of key market pillars

The above diagram summarises important wider factors to consider. These are –

- Advice and information – good quality, independent advice and support can help people navigate a complex landscape.
- Assessment support – helping people develop and follow an action plan that is appropriate to their circumstances and helps meet wider heating targets.
- Quality assurance – consistently high and standardised levels of products, customer service, skills and reporting to provide certainty on quality of goods and services (for both customers and finance providers).
- Consumer protection – safeguarding customers against unfair practices in the market place and ensuring effective right to redress where unsatisfactory advice or services have been provided.
- Monitoring and evaluation – tracking progress and impact of initiatives with timely data and evidence to create effective feedback loops.
- Marketing and communications – to raise the profile of available products and services, including the features and benefits for different parties.
- Delivery mechanisms – routes to market and to delivery of measures, recognising a range of options exist across different types of buildings and/or ownership structures, for example, Heat Networks or LHEES.
- Skills and supply chain – having an appropriately trained workforce and sufficient capacity within supply chains to deliver the physical improvement works.

Annex 5 provides more information of market pillars and what the Scottish Government is doing to develop them.

3.6 Regulations

Effective regulation can support stimulating the market for energy efficiency and ZDEH by influencing the demand for retrofitting measures and their accompanying need for finance. Regulations can also support supply side confidence to develop financing products, as well as encourage investment in the necessary skills and training for employees to meet an increased demand for retrofitting work.

Regulations can help boost the demand for financing products to fund energy efficiency and ZDEH improvements by clearly setting out the requirements which have to be met for different building tenures and the timeframes which they need to be achieved by. Evidence indicates that purely voluntary approaches to encouraging energy efficiency and ZDEH retrofit will not deliver the scale of transformation required, even with generous grants available. For example only 1% of forecast demand for UK Green Deal financing was actually provided to consumers. Even allowing for design flaws with the products offered, the level of take-up for such a voluntary scheme was extremely low¹³.

As well as boosting the demand for ZDEH and energy efficiency, regulations can boost the supply of finance by providing a clear and strong signal to the market about policy intentions. This can provide confidence to the market, stimulating the development of new products, as there is greater certainty of future demand. It will also support growth and investment in market pillars such as skills development and the building of supply chain capacity, as the wider market responds to the clarity about future conditions and demand.

The Scottish Government is taking forward work on regulation and is committed to consulting on a proposed Heat in Buildings Bill in the coming year. While this Taskforce has not considered the issue of regulation in detail, we do believe that appropriate regulation will be an important part of the overall structure required to deliver against the Scottish Government ambitions to decarbonise homes. Regulations will need to be carefully developed and be cognisant of a Just Transition, to avoid being regressive and placing an undue burden on those least able to pay.

3.7 Co-Investment

Co-investment, also known as blended finance, is a financial structuring approach which combines finance and other resources from a range of sources with different risk tolerances for use on agreed shared priorities. Many forms of blended finance structures are currently either in use or under discussion. In general, these financial structures combine capital from public (or philanthropic) sources to help overcome the for private investors or lenders¹⁴.

There is a strong case for government intervention and support to spur innovation and lead by example, particularly in the short term. This will help to support market creation and maturation as government can foster an attractive investment

¹³ [Green Deal and Energy Company Obligation - National Audit Office \(NAO\) report](#)

¹⁴ [Description of blended Finance on the Convergence website](#)

environment. As private investors, even patient investors such as pensions funds, are investing clients' money and they have to comply with the legal and fiduciary responsibilities established by regulators. This requires longer term confidence in systems and risk profiles to enable finance to flow.

In some instances, this may require blending approaches that have comparatively high portions of public to private finance, at least initially. As noted by Professor Mazzucato in her proposition for a mission-orientated frame for the Scottish National Investment Bank:

“Missions by nature are designed to spur innovation towards addressing societal challenges. But because innovation is highly uncertain, has long lead times, is collective and cumulative, it requires a specific type of finance [...] Early stage public investment helps to create and shape new markets, nurturing new landscapes which the private sector can develop further.”¹⁵

In blended structures, public sector funds can reduce risk exposure for co-financing partners by absorbing part or all the partners' exposure to risks of missed repayments, default by borrowers or other forms of losses. In some instances, grants to support project development may be paired with pre-arranged private debt or equity. In other cases, public or philanthropic and private capital may be pooled together in a fund with different tranches of capital, accepting different levels of risk weight returns or different repayment priorities in case of default. Public commercial capital can also be deployed with a different risk appetite, or on a more patient basis than typical private lending or investment. Finally, public guarantees or insurance products may be issued to 'credit enhance' transactions or reduce the exposure of private investors to default and other risks.

An advantage of these approaches is that it can 'crowd-in' additional private sector funding, as the different tolerances for loss and return requirements between private capital and public grants or sub-commercial loans enables the blended approach to work. This can also mean lower repayment costs for individuals than if the funding was provided through solely private channels, or the ability to borrow more and still ensure repayments were affordable. It therefore has the potential to create significant scale by bringing a number of finance providers together, including longer term investors such as pension funds and insurers, to create a larger pool of finance, allowing the sharing of expertise and splitting of risk.

There is a range of co-investment mechanisms that could work in the ZDEH market, targeted at either an individual property level or at communal solutions. Similarly there is a range of options for investment vehicles that could manage Scottish Government interests. A number of forms of blended finance are already in use internationally to support energy efficiency and ZDEH investment.

The Scottish Government is already providing both grant and subsidised lending, combined with advice for households and SMEs (detailed in Annex 2). As illustrated

¹⁵ [Paper by Professor Mariana Mazzucato and Laurie Macfarlane on a mission oriented framework for the Scottish National Investment Bank](#)

in examples on pages 11-13, households are able to blend these individually with sources of private finance to fund the full costs of installations. However, examples from other governments show that this type of public funding can also support co-investment and blending at an overall level to reduce the overall costs to the public sector, while offering similar levels of public support to individuals.

For example, Box 1 presents details of the German Government's energy efficiency loan programme running since 2006 by KfW Development Bank.

Box 1: Example of Germany's Energy Efficient Construction and Rehabilitation Programme.

Launched in 2006, Germany's Energy Efficient Construction and Rehabilitation Programme combines limited grants from the German national budget with repayable concessional loans to households. Structured in a manner that incentivises ambitious renovations that meet the highest levels of national performance standards, the German Government provides performance-based grants of up to a maximum percentage of total project cost. The loans application and contracting process is managed by partner retail banks, which are then refinanced for the amount of the loan at concessional rates by KfW, Germany's state owned development bank, which is committed to improving economic, social and environmental conditions across the world.

KfW raises most of its finance through international capital markets, issuing bonds which are guaranteed by the German state. While it is not allowed to compete with retail banks, as its state guarantees enable it to offer lower levels of interest, it can facilitate business in areas that fall within its defined mandate, for example, improving the environmental sustainability of homes.

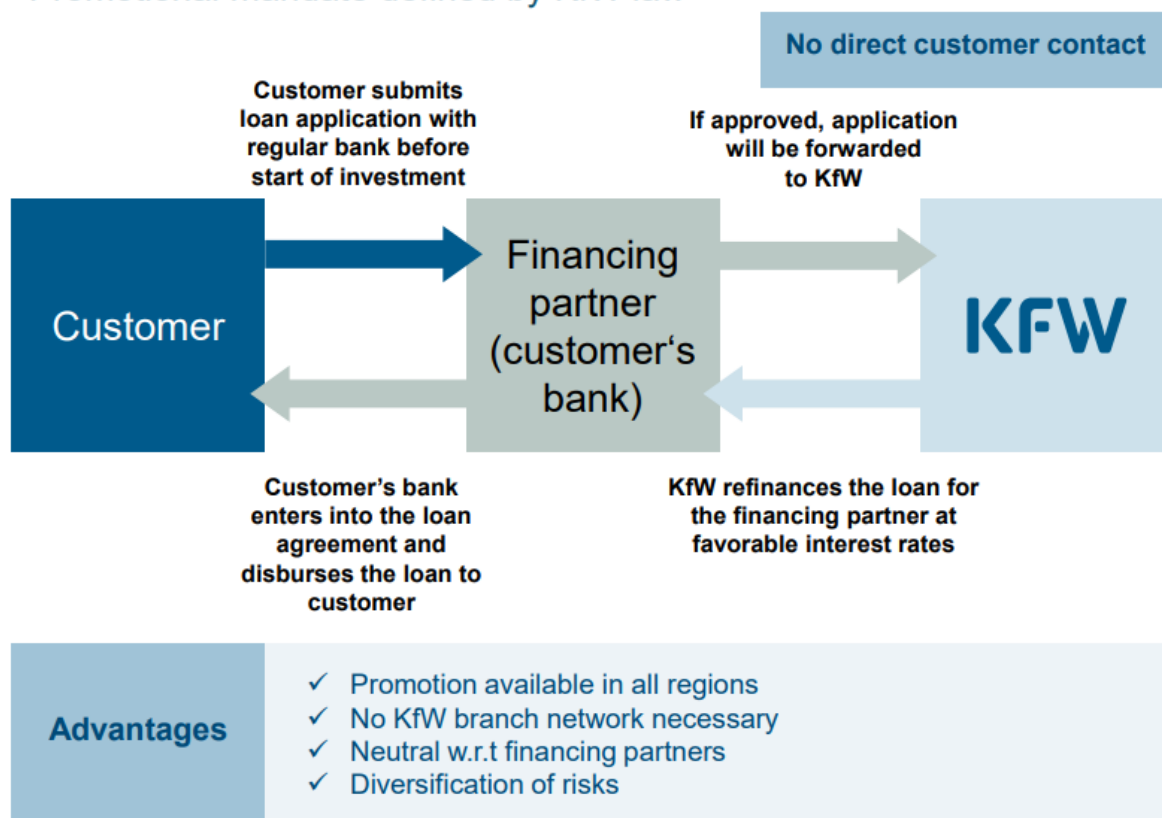
As seen in figure below, customers apply for a loan through a participating retail bank, which manages the approval process. If approved, the partner bank notifies the KfW, which refinances the loan for the bank. KfW refinances these loans at a favourable interest rate which is passed on in part to the final customer. KfW is able to provide a concessional rate using limited public subsidies due to its ability to raise debt on the capital markets at comparatively low rates. KfW is, in turn, able to repay the debt raised on international capital markets by means of the repayment of loans by customers.

As the on-lending banks take on the credit risk of the final customers, they need to understand the programme conditions, including the technical aspects, so as to adjust their systems and information materials to reflect any changes. KfW also appoints special liaison officers for the partner banks and offer regular training on relevant issues for staff of the on-lending banks.

As a result, the programme is able to blend private investment from the international capital markets as well as the resources and existing networks of participating commercial banks, using limited direct resources from the German national budget. This has been estimated to deliver up to a 1:10 leverage ratio of public subsidy to loans and private investment (Hohne et al., 2009)¹⁶.

1. On-lending Principle – a successful business model

Promotional mandate defined by KfW law



17

Co-investment is a well-developed concept in Scotland and has been applied in areas such as funding City Region Deals or for funding of the UK Catapult Network of innovation and research centres. The development of co-investment vehicles will almost certainly need to play a part in financing the scale of heat transformation necessary. Co-investment mechanisms offer the potential to be combined with private sector products such as green mortgages or Property Linked Finance, which are discussed later in this report (see section 5.1). They could also be used to unlock investment in area-based schemes and potentially social housing, topics which will be the focus of our Part 2 Report next year.

¹⁶ HÖHNE, N., BURCK, J., EISBRENNER, K. & VIEWEG, M. 2009. Scorecards on the best and worst policies for a green new deal, London (E3G & WWF), Ecofys/Germanwatch.

¹⁷ https://www.kfw-entwicklungsbank.de/PDF/Download-Center/Materialien/2018_Nr.6_Lessons-Learnt-from-Germany-and-Emerging-Economies.pdf

Scotland has organisations with expertise in investment, such as the Scottish National Investment Bank and Scottish Futures Trust, which understand the nuances around co-investment, including the characteristics to be considered in structuring appropriate vehicles for investment. Taskforce members, including Scottish Financial Enterprise, are also well placed to facilitate connections with experienced private sector investors which will have direct knowledge of structuring blended investment mechanisms in other contexts, including managing the risk profile for different parties.

4. Finance context and constraints

4.1 Financing supply context and influences

The finance market for supporting the transition to green buildings is currently relatively immature, reflecting a range of unknowns around longer term demand, returns and general performance data. This combines to heighten the perception of risk amongst finance providers and investors.

Wider market factors, such as the availability of skills to deliver physical work and the supply chain's ability to scale up materials at pace, also affect risk decisions for finance providers. There are, however, indications that the range of green financing products available to support decarbonisation of domestic properties is expanding. This is being influenced by broad market changes across the UK, as discussed below.

4.1.1 Overarching Macro-Economic Drivers

We are currently witnessing rates of inflation not seen in the last forty years and this presents serious economic and social challenges for Scotland and the UK. The high rates of inflation have contributed to a cost crisis impacting both living costs and the costs of doing business. This cost crisis follows challenges created by the COVID-19 pandemic, Brexit and a period of prolonged austerity.

The negative impacts of rising costs are already being felt in Scotland and are likely to remain high in the public consciousness as an issue of significant concern. The Taskforce is also aware that these issues are likely to have an impact on the future path and costs of decarbonisation Scotland's buildings.

However, market forces, encouraged by increased environmental awareness amongst individuals and the increased importance of Environmental Social Governance (ESG) amongst businesses, are already establishing the necessary building blocks for a thriving market in green finance. ESG provides a set of criteria which guide business operations by measuring the company's sustainability and ethical impact on the environment, people and leadership structures. Positive action by regulators and investors can further encourage this trend.

The growth in importance of ESG over recent years gives grounds for optimism that the supply of financial products that fund environmental improvements will continue to grow and flourish where they can demonstrate a sound commercial case. Increased demand from domestic and non-domestic customers, the later motivated by gaining a market advantage through delivering on their own ESG strategies, will help strengthen the commercial case for finance providers.

Embedding ESG in organisations' operating models and articulating this as part of their corporate strategies will help them to meet the increasing demand from consumers, society and investors for involvement with a business which recognise the importance of their ethical responsibilities. It will also support organisations to attract and retain talent. Many investors are increasing pressure on companies to substantiate their impacts on society and the effects of their ESG strategies before

agreeing to any investment. Some large investment providers have now even introduced preferred rates or packages for business that can substantively demonstrate a strong ESG strategy delivery¹⁸.

4.1.2 Changes Within the Lending Market

At the beginning of 2021, the UK Government undertook a consultation to seek views on proposals to set requirements for lenders to help homeowners to improve the energy performance of their homes – initially through reporting of the EPC profile of their loan books. Implementation of any approach to require mandatory reporting of EPCs on lenders loan books would need to be carefully structured to avoid creating a situation where only the most energy efficient homes are able to access finance. However, developing a metric which encourages improvement in EPC of each home in a mortgage portfolio, rather than just encouraging lending to the most efficient homes, could be helpful. This would need to be implemented at a UK level.

4.1.3 Green Taxonomy

Any proposed reporting of ‘green’ assets or investments by lenders requires a means of classification of such assets. The UK Green Taxonomy is a common framework for investments that can be defined as environmentally sustainable. It is aimed at helping to scale up sustainable investment and will provide companies, investors and policymakers with appropriate definitions for which economic activities can be considered environmentally sustainable. This can create security for investors, protect against ‘greenwashing’, help companies to become more climate-friendly and help drive investments where they are most needed¹⁹.

Reporting requirements for lenders and financial institutions influence the strategic decisions made and products offered by those organisations. These reporting requirements will become mandatory by the end of 2023 for larger organisations, to meet financial regulatory requirements, or voluntarily for smaller companies wishing to signal to potential customers particular values it prioritises. For retail finance providers, this reporting could be to attract customers or to secure investment from institutions committed to reducing the emissions of their asset books.

4.1.4 Other Influences from Government and Other Markets

Alongside this, for private sector finance to flow at scale, responsibilities to clients and financial regulators must be met. Investors have fiduciary responsibilities for clients’ money, to make best decisions on their behalf, while regulators are clear on how assets and liabilities are matched off, and what level of risk is appropriate. These regulatory boundaries are established at a UK level. While Solvency II²⁰ reform, which is currently underway, may help to make it easier to invest in green programmes like ZDEH measures – possibly by reducing the risk margin capital buffers required for insurance companies – it is unlikely to lead to substantial changes in practice and culture in the shorter term.

¹⁸ [Investors incorporate ESG standards into their sustainable funding packages](#)

¹⁹ [Green Technical Advisory Group \(GTAG\) Terms of Reference](#)

²⁰ [Solvency II | Bank of England](#)

At this time, however, the Taskforce believes that, unless confidence can be offered around credible paths to delivery of Net Zero goals, investment asset owners and managers cannot confidently invest in areas where the overall join-up, scale and level of risk/return do not meet their requirements. As capital is mobile across international borders, the UK needs to be conscious of the environment other countries are creating to make it more financially attractive to invest in green retrofit and environmental sustainable programmes.

4.1.5 Challenges constraining financial sector provision of finance

Substantial academic and applied literature has identified the barriers to channelling private finance for energy efficiency and green heat projects²¹. The literature has identified a number of barriers that have posed challenges across both investment and debt finance including:

- Challenges to assessing the cash-flows of projects: financial market participants are typically unfamiliar with estimating the cash flows based on energy conservation, and, in turn, returns from savings. Additionally, these assessments often require an in-depth technical understanding of the context of the investment (building typology), technologies or conservation approaches being deployed and to what extent, as well as the potential for rebounds in energy demand that may reduce overall savings. Furthermore, there is only a limited historical track record of this type of investment to use as a basis for comparisons or as a benchmark. Finally, returns may also be exposed to different sources of volatility, such as fluctuations in national policy frameworks and changes in energy market prices.
- Challenges around structuring transactions: financial market actors have noted that energy efficiency and related investments often involve significant transaction costs corresponding to either their size (typically relatively small), a lack of standardisation of project structures, assessment approaches and contracts, as well as the assessment of specific legal and performance-related risks. As a result, these transactions may be seen as overly novel and bespoke, thus requiring relatively long approval and structuring timeframes. This has been noted as an issue both for traditional forms of debt and investment, as well as co-investment and blended finance.
- Challenges to integrate investments into investor portfolios: mobilising finance from investors into this area often faces a number of additional challenges, given that energy efficiency and ZDEH investments tend to be relatively small in size, implying both high transaction costs and being inconsistent with the typical size of investment deals that are regularly in the tens or even hundreds

²¹ [A.] Parker, M., Guthrie, P., 2016. Crossing the energy efficiency chasm: an assessment of the barriers to institutional investment at scale, a UK perspective. *Journal of Sustainable Finance & Investment* 6, 15–37. [

B.] Climate Strategy, COWI, d-fine, Directorate-General for Energy (European Commission), EEIP, EnergyPro, Fraunhofer ISI, ICCS-NTUA, Viegand Maagøe, 2022.

[C.] Report on the evolution of financing practices for energy efficiency in buildings, SME's and in industry: final report. Publications Office of the European Union, LU.

of millions, rather than tens of thousands of pounds. As a result, aggregation or securitisation of a large number of ZDEH and energy efficiency investments may be seen as necessary, although they may also run into issues of liquidity and tradability as they may not fit into traditional assets classes.

4.2 Finance demand constraints and challenges

There are, though, a range of barriers that currently constrain the levels and pace of private finance offerings for energy efficiency and ZDEH. Some of these barriers will apply across domestic and non-domestic buildings, while some will apply across ownership models, for example, owner-occupier and private rental landlords. Others will primarily impact on a specific ownership model. Taken together, though, they explain why the demand for, and supply of, financing for ZDEH is currently an immature market in the Scotland and the UK.

4.2.1 Complexity of Making the Right Choice

Whilst not a finance challenge, the complexity involved with retrofit – including uncertainty about making the right choice, unfamiliarity with the available technologies, a confusing advice and installer landscape, and the disruption of the physical work – discourages people taking action. The need for many properties to undertake substantial internal work for piping and radiators when installing a heat pump is also daunting and off-putting for many.

In contrast, installing a new gas boiler is more straightforward, as people are familiar with the technology, can utilise a range of traditional funding options and can readily access a range of potential suppliers, as well as easily access aftercare service. The Taskforce is therefore strongly of the view that simplifying customer journeys, including making them easy to access trusted advice on energy efficiency and ZDEH investment, is an essential prerequisite to stimulating the demand required to meet targets.

The Taskforce also recognises the current economic context, with the cost crisis leading to increased mortgage costs, rising energy bills and high food prices. In such an environment it is understandable that many households may feel that they cannot make further financial outlays with potentially long-term payback periods. The Scottish Government is aware of the immediate challenges in this area and will need to continue to work to ensure that the right mix of future funding support and private finance is coupled with helping those who need it the most.

At the core of this, the Scottish Government, working with other trusted voices, will need to win the hearts and minds of individuals across Scotland to secure buy-in and convert that buy-in to clear action. In addition to understanding what to do and why, support and clear advice in an accessible format for people will be essential in helping people understand how to take the most appropriate actions for their property.

4.2.2 Perceived Impact on Property Value

A key barrier to investing in ZDEH across all property types and for all owners, is the difficulty in understanding how they will recover the value of their investment over the longer term, through a combination of valuation enhancement (should this materialise) as well as potential future energy savings. For tenanted properties, the focus of the tenant will be on the latter.

It is generally accepted that investing in visible improvements, like a new bathroom or even redecorating, can boost the value of a property. For heating and energy efficiency upgrades the benefits remain uncertain and would accrue over time by a combination of possible property value enhancement (relative to an unimproved property) and potential future energy bill savings. The realisation of property value enhancement from heating and energy efficiency investment has yet to be achieved at scale and is influenced by wider market factors, including property supply and demand, as well as UK level regulatory decisions around the relative costs of gas compared to electricity. The wider health and comfort benefits from having a better heated home may also not fully translate through to property value.

The Taskforce also noted that the presence of regulations in the future, which specify standards for different properties, may have an impact on property valuation. When retrofitting measures are voluntary, they can be viewed by the market as a 'nice to have', but are not fully reflected in valuations.

Notwithstanding, there is cause for optimism, with emerging indications that this is starting to change in parts of the market where heating improvements are leading to enhanced property values, reduced energy bills and lower credit risks for institutions²². This is strengthened by research from Rightmove, which shows a greener home attracts an additional price premium on top of local house price growth, with an average of almost £56,000 more for homes that have improved from an EPC rating of F to a C, sometimes referred to as the 'EPC Premium'²³.

4.2.3 Poor financial returns

For many homeowners and organisations, the key financial calculation will be whether the annual cost of borrowing money to finance the retrofit is larger or smaller than the resulting reduction in the energy bill. That is, are they (the householder or organisation) left in a better or worse financial position by carrying out the work?

Whilst heat pumps are more efficient than incumbent gas and oil systems, due to the current structure of pricing – with gas cheaper than electricity – their overall impact on bills will be determined by the levels of energy use before and after retrofitting. Energy efficiency improvements will reduce energy consumption, and would therefore reduce bills on their own. However their impact when combined with ZDEH, which changes the main source of fuel to electricity, means that in reality most households are unlikely to be in a better overall situation once the upgrade costs are taken into account.

²² [Article by the Nationwide Group which indicates that heating improvements are leading to enhanced property values](#)

²³ [Rightmove Greener Homes Report 2023](#)

The current relative cost of electricity compared to gas is therefore likely to reduce appetite to borrow and only incentivise fairly superficial retrofit, rather than the deep retrofit required by Net Zero targets. This is particularly the case with increased interest rates leading to increased costs for repayment of any borrowing, both for individual consumers as well as for finance providers, the latter borrowing on wholesale markets and making commercial considerations that will likely limit their ability to offer low enough interest to make the overall case for upgrading attractive to most households or organisations.

Clearly, government subsidies are one way of reducing the required borrowing costs by providing part of the upfront capital, but collective schemes that are area-based may provide ways to access cheaper capital and deliver economies of scale that would reduce the requirement for public sector subsidy. These will be explored in the Taskforce's Part 2 Report. Reformation of the UK electricity market, to reduce the cost of electricity relative to gas, would also help incentivise retrofit works by increasing the value of savings for a given reduction in energy consumption as a property moves from heating via fossil fuels to ZDEH. Powers to reform electricity prices sit with the UK Government and regulators.

4.2.4 Split Incentives

A key challenge for the private rental sector, and for many leased non-domestic properties, relates to 'split incentives', whereby the landlord bears the cost of retrofit work, but the tenant pays for energy bills and benefits from any savings. Alongside this, there is little incentive for landlords to invest if the improvements are not reflected as an increase in property or rental value. Depending on demand for properties in a particular area, landlords can be reluctant to upgrade and increase rent as rentals may appear uncompetitive compared to other similar properties. This is even more pronounced if a landlord is likely to sell their private rental property in the short to medium term, as there would be even less time to recover the costs of any ZDEH or energy efficiency improvements made through growth in the property price market overall.

For tenants, the incentives to invest are negligible because the payback period to recover installation costs through savings generated by more efficient use of energy is too long compared to typical tenancy duration of around 1-2 years²⁴.

The split incentives challenge is further complicated in the non-domestic sector as investment in energy efficiency and ZDEH systems can attract a 'green rental premium' for landlords. Given nearly 60% of non-domestic properties have electricity as a primary heating source (compared to just over 10% of domestic properties) energy efficiency improvements may be particularly beneficial in helping reduce energy bills. However, upgrades by landlords can be counter-productive as they can

²⁴ [Article by Simply Business noting that Your Move data indicates that the average UK tenancy length is almost 2 years](#)

increase the rateable value of the building and hence Non-Domestic Rates bills for tenants. This in turn can offset any potential energy bill savings for the tenants who may also face higher rents than in less energy efficient buildings.

Additionally, the complexity of ownership to tenant structures in the non-domestic sector can make the split incentive challenge even more pronounced than is the case domestically, particularly in larger buildings like shopping centres or office blocks with multiple tenants. In such instances, the building owner may be a formally structured property fund, with building managers responsible for general running of the building and tenants located in specific plots. Responsibilities for heating provision and energy efficiency may be split across all parties and are likely to be defined in legal contracts between each party.

4.2.5 Lack of Promotion of Green Mortgage Products

As discussed in section 5.4, while green mortgage products currently exist, the Taskforce does not believe they are as widely understood or promoted as they might be. We consider this a missed opportunity to grow the green mortgage market, as over 70% of annual house purchases in Scotland involve owners taking out a mortgage. An overwhelming majority – 80% – of mortgages taken out in the UK are sold through mortgage brokers. When the number of property owners renewing or switching mortgage products each year is taken into account, the scale of the potential market for ‘green’ mortgage products will be substantially greater than the annual £13 billion for new house purchases ²⁵.

While the Taskforce acknowledges that mortgage brokers have to weigh up a range of factors when offering customers advice, and ensure they provide appropriate advice to each customer, we consider that more can be done to improve understanding of the benefits of green mortgages. This applies to the public in general, but also to mortgage advisers who perform the role of a trusted messenger in the mortgage market.

Work has already begun to educate brokers about green mortgage product solutions and retrofitting technologies, such as the Green Finance Institute’s Broker’s Handbook, which was published in February 2023²⁶. This has been followed up by the inaugural Green Mortgage Summit, which brought together stakeholders from across the sector, including brokers, to convene and join up the thinking on progress within the market. Broker awareness and engagement remains a key priority of the Green Finance Institute’s Green Mortgage Campaign.

While most mortgages are sold on the basis of cost – and customers prioritise affordability in most decisions – it may be misleading to look at just the interest rate when making a comparison between a product identified as a green mortgage and a more traditional mortgage. A Green Mortgage, for example, might offer cashback that could act to offset any small differences in monthly repayments, or to provide owners with a cashback sum at a time when they are incurring significant costs associated all aspects of property purchasing. We also anticipate that the volume

²⁵ [Intermediaries to take 90% market share by 2024: IMLA | Financial Reporter](#) .

²⁶ [Broker’s Handbook \(greenfinanceinstitute.co.uk\)](#)

and variety of green mortgage products will expand in the coming years, so it will be important to ensure coordinated and coherent messages around their features and benefits.

4.2.6 Legislative barriers

Personal loans are a form of credit regulated in the UK under the [Consumer Credit Act 1974](#) (CCA). The CCA was a landmark piece of legislation that provided comprehensive protections for consumers in relation to how credit was used at the time. Since then, however, use of and ambition for credit has evolved dramatically.

Some sections of the CCA (particularly sections 56 and 75) create risks for lenders developing green personal loans. Sections [56](#) and [75](#) apply when finance is used for a particular good or service (such as energy efficiency or ZDEH solutions). Both sections cause a lender and supplier to be equally responsible for any purposeful or accidental mis-selling, misrepresentation, or breach of contract. Any successful claim under section 56 or 75 could be a one-off payment or a series of payments, which can lead to high claims (liabilities) and potential claims (contingent liabilities) costs for lenders.

The complex nature of energy efficiency and ZDEH solutions make them more exposed to any mis-selling, misrepresentation, or breach of contract risk. The potential impact of sections 56 and 75 on green home finance was realised in the UK during early lender activity associated with financing solar panels. A continuing legacy arising from this time has been a perception by many lenders that energy efficiency and ZDEH solutions represent a prohibitively costly risk to them.

4.2.7 Quality of Data

One of the features of an efficiently functioning market is the reliable availability of robust and transparent information or data, which allows all parties to make informed decisions around what and when to make investments, while understanding the associated risk profile. Data is also important for tracking progress against strategic targets and to inform monitoring and evaluation activity. This supports creating effective feedback loops that allow schemes and products to be refined in response to delivery experience, and/or resources to be refocused on the most effective measures.

In our discussions, the Taskforce has found that, as a relatively new and developing area, there is currently a range of gaps in the data available to track progress with improving the energy efficiency and ZDEH levels of Scotland's buildings. Domestic and non-domestic buildings have different challenges. Whilst domestic buildings have EPCs that measure the energy efficiency of buildings, they can often be out-of-date, either by being unreflective of property's true environmental impacts or by virtue of the subjective process involved in assessment making an EPC rating inaccurate. Some ZDEH measures, such as air-source heat pumps, could even have an adverse impact on the EPC of a property.

Non-domestic buildings face a different challenge, since reliable data on features such as EPC ratings for buildings of different types is not easily accessible or

particularly relevant. For instance, similar properties of a similar age, such as community primary schools, may have very different energy consumptions because of differences in the way they are used, for example, through the extent of additional 'out of hours' use of the building.

5. Overview of Current Market Financing Options

A range of financing mechanisms is currently in use in the energy efficiency and ZDEH markets. These different instruments, structures and products are currently being implemented either separately or in packages and offer potentially useful lessons for financing the transition to ZDEH heating and installation of energy efficiency measures for different types of buildings and ownership models in Scotland. Summary information on the applicability of each of these mechanisms is provided in Tables in section 5.1 below with further detail on each in Annex 2.

Some of these mechanisms will already be used extensively and will not, therefore, be new concepts to consumers, rather their application to finance green housing improvements will be more novel. We recognise, though, that many of the products discussed in more detail in this report, particularly secured or unsecured loans, will only be accessible to individuals who will be able to afford the repayment terms, even for those products that have no significant upfront fee. For those who are able to pay, the ability to access affordable finance is important because it enables them to act now, this also supporting market development more broadly.

Many people in the able to pay group already self-finance either through their own savings or recourse to loans to cover the costs of installing a new gas boiler, with many retailers offering interest free finance options. Other financing options will be less familiar to consumers, being currently unavailable in Scotland, such as heat as a service, or are available but predominantly used at a larger organisation level, for example, bonds (both of which will be discussed in more detail in the Taskforce's Part 2 Report).

While the individual products outlined below all have their own merits, it is worth noting that, in practice, delivery models are likely to incorporate a variety of mechanisms and funding sources. International experience suggests that it is unrealistic to focus on purely private finance mechanisms to drive transformational change in new areas like heat. Rather, different forms of public concessional and private finance solutions are required²⁷. Individuals may also require combinations of the products summarised below over the lifecycle of any energy efficiency or ZDEH solutions installed.

²⁷ [Toolkit for Energy Efficiency Financing Instruments for Buildings in the Arab Region \(unescwa.org\)](https://unescwa.org/)

5.1 Summary of possible financing options (descriptions of each product below can be found in Annex 2)

Grants	
Summary description: grants are funding provided by Scottish Government or other third parties for use on a particular activity like installation of ZDEH measures with no need to repay the grant funding (providing conditions are complied with).	
Used by Private sector (incl. households)	Yes
Used by public sector	Yes
Source of direct finance	Yes
Tool to 'crowd-in' or support low cost private sector capital	Yes
How well developed in market (1- little or no; 3- strong)	3
Further considered in this report	No
Suitability to finance energy efficiency and ZDEH: Scottish Government currently provides grants through various programmes (see Annex 2), helping reduce upfront costs for eligible individuals. Grant could be combined with other sources of finance including traditional loans or 'green mortgages'. The scale of funding required to grant fund installation of ZDEH and energy efficiency measures across all properties is likely to exceed the level of available Scottish Government budget.	

Traditional Self-financing (including unsecured lending)	
Summary description: individual sectors / property owners source their own financing requirements through traditional channels for undertaking ZDEH measures, for example, through unsecured bank loans, by means of credit cards or selling any stocks or shares owned.	
Used by Private sector (incl. households)	Yes
Used by public sector	No
Source of direct finance	Yes
Tool to 'crowd-in' or support low cost private sector capital	No
How well developed in market (1- little or no; 3- strong)	3
Further considered in this report	No
Suitability to finance energy efficiency and ZDEH: able to pay property owners could finance installations through traditional financing sources, such as loans or rental income, without the need for further support or new 'green' specific financing solutions. Most property owners are likely to have access to these more traditional financing routes and will be familiar products to them. The extent to which they are used is likely to depend on the associated cost of any ZDEH works.	

Green Loans or mortgages (secured lending)	
Summary description: offered by lenders, including banks, to existing domestic and non-domestic customers for specific measures related to green or environmentally sustainable upgrades. 'Green mortgages' generally provide additional secured lending available to individuals from their existing mortgage provider to finance green upgrades to their homes.	
Used by Private sector (incl. households)	Yes
Used by public sector	Yes
Source of direct finance	Yes
Tool to 'crowd-in' or support low cost private sector capital	No
How well developed in market (1- little or no; 3- strong)	2
Further considered in this report	Yes
Suitability to finance energy efficiency and ZDEH: one of the more common forms of green financing for energy efficiency and ZDEH, although still a developing area. Particularly for domestic properties, many providers are currently considering their offerings and testing new products, expecting increased future market demand, particularly as these can support meeting ESG requirements of finance institutions. A more established range of green loans is available to non-domestic building owners.	

Equity Schemes	
Summary description: enables people over 55 years old to access tax-free financing by releasing equity in their home; that is, giving up a partial ownership stake or agreeing to repay a certain amount to a third party in the future in return for an upfront cash receipt and being able to continue living in the property as long as they wish. The financing can have many potential uses, including the funding of ZDEH solutions.	
Used by Private sector (incl. households)	Yes
Used by public sector	No
Source of direct finance	Yes
Tool to 'crowd-in' or support low cost private sector capital	NA
How well developed in market (1- little or no; 3- strong)	1
Further considered in this report	Yes
Suitability to finance energy efficiency and ZDEH: there is considerable equity value held by property owners. Releasing some of this, particularly amongst older householders, could pay for ZDEH installations and may provide an option for those who have asset wealth but limited income. Other potential costs, such as boosting income in retirement, or to fund future care needs, are amongst the considerations people would need to think about in deciding on the suitability of equity release products.	

Property Linked Finance	
Summary description: Property Linked Finance (PLF) can support homeowners to fund up to 100% of the upfront costs of energy efficiency improvements – with the unique characteristic that the finance is linked to the property, rather than the property owner – which results in payment obligations transferring to the new owner when a property is sold. Underpinning PFL is the principal that the person benefitting from energy efficiency measures at any given moment is responsible for the PLF payments.	
Used by Private sector (incl. households)	Yes
Used by public sector	No
Source of direct finance	Yes
Tool to 'crowd-in' or support low-cost private sector capital	Yes
How well developed in market (1- little or no; 3- strong)	1
Further considered in this report	Yes
Suitability to finance energy efficiency and ZDEH: PLF is a financial solution where the payment obligation is linked to the property, rather than the property owner. The transfer of finance with changes in building ownership could overcome a key challenge of efficiency upgrades known as the “payback period barrier”, whereby homeowners looking to move in the short to medium term are deterred from making energy efficiency upgrades as the costs of repaying the upgrades are greater than potential energy bill savings while they still own the property. While not currently available in the UK, a form of PLF is widely utilised in USA, Australia and Canada to finance property upgrade works.	

On-bill Repayment	
Summary description: provides a mechanism whereby utility providers invest in, or provide customers with, the financing to undertake energy efficiency upgrades. Customers then pay for those upgrades through a charge on their energy bill over a set period of time. Works generally have to be carried out to an agreed standard and/or through an approved list of contractors. Tends to be focused on individual households, rather than non-domestic customers, where mechanisms like Energy Performance Contracting may be more applicable.	
Used by Private sector (incl. households)	Yes (domestic)
Used by public sector	No
Source of direct finance	No
Tool to 'crowd-in' or support low cost private sector capital	No
How well developed in market (1- little or no; 3- strong)	1
Further considered in this report	No
Suitability to finance energy efficiency and ZDEH: Scottish Government unable to apply this with current devolved powers. Mechanism was used as part of the UK 'Green Deal', but proved challenging to deliver at scale. Given the integrated UK energy market, it is also likely to be something best applied at a UK-wide level.	

Heat as a Service	
Summary description: private sector suppliers provide finance investment and install ZDEH measures, with property occupants paying a contracted monthly amount for a combination of the upgrades, heat provision and/or maintenance. Sometimes referred to as a Heat Pump on Subscription model, although there is no reason why the model has to be limited to heat pumps as the ZDEH technology.	
Used by Private sector (incl. households)	Yes
Used by public sector	No (although similar to EPC contracting)
Source of direct finance	Yes
Tool to 'crowd-in' or support low cost private sector capital	Yes
How well developed in market (1- little or no; 3- strong)	1
Further considered in this report	No
Suitability to finance energy efficiency and ZDEH: by shifting customers away from buying fuel, towards paying an energy supplier for a service, potentially including ZDEH equipment and maintenance, it offers a possible route to deliver ZDEH, although requires scale to be economically viable for supplier. The financing would be provided by the supplier, with repayments being supported from income from service agreements with the domestic customer.	

Dedicated Property and Investment Funds	
Summary description: a type of fund that invests in rental property or other real estate assets, including commercial property. Can be open-ended, meaning they accept investment at any time; or closed-ended, with a limited number of shares. Property funds can be traded in financial markets and can provide a return for investors through selling their stake at a higher price than for what it was purchased, or through dividends, which are generated by the underlying assets in the fund (rental income, revenue from property sale, etc.).	
Used by Private sector (incl. households)	Yes
Used by public sector	No
Source of direct finance	Yes
Tool to 'crowd-in' or support low cost private sector capital	No
How well developed in market (1- little or no; 3- strong)	3
Further considered in this report	No
Suitability to finance energy efficiency and ZDEH: open and closed-ended property funds are a well-established and regulated financial mechanism, trading on the London Stock Exchange and can comprise particular types of property. This could include funds focused on properties converting to ZDEH. Commercial considerations around the rates of return and scale of properties – both domestic and non-domestic, which could comprise the underlying assets – will determine the market appetite to establish ZDEH focused property investment funds. It is likely that 'green' property funds will evolve naturally over time as the number of ZDEH buildings increases.	

Energy Performance Contracting	
Summary description: agreement between a customer (e.g. Registered Social Landlord (RSL) or private sector landlord) and an energy services company which provides energy efficiency upgrades, across multiple properties, or buildings to an agreed standard – typically designing, installing and maintaining the upgrades – to deliver an agreed reduction in energy consumption levels with the customer, paying a monthly service charge for the duration of their contract. Energy Performance Contracting (EPC) agreements aim to ensure the energy bill savings post-upgrade are sufficient to cover the monthly costs to the service provide. An initial payment from the customer may also be required.	
Used by Private sector (incl. households)	Yes (non-domestic)
Used by public sector	Yes
Source of direct finance	Yes
Tool to 'crowd-in' or support low cost private sector capital	No
How well developed in market (1- little or no; 3- strong)	2
Further considered in this report	No
Suitability to finance energy efficiency and ZDEH: used by the non-domestic sector, particularly the public sector, although the model does have potential for use in the domestic sector too if scale for delivery across multiple properties could be guaranteed (for instance with RSLs or larger private sector landlords). Benefits of EPC contract include: the customer not having to fund the upfront costs of the upgrades, project risks being transferred to the energy services company, and having a guarantee of the level of energy savings being delivered, as future repayments are tied to the energy service company delivering the agreed outputs.	

Green Bonds	
Summary description: raising finance from financial markets by issuing debt (in the form of bonds) which is then repaid by the bonds issuer at agreed interest rates over time to all purchasers of the bonds. The financing raised by issuing the bonds must then be used for the purposes stated in issuing it, for example, to finance ZDEH upgrades. Repayments must made to investors as per the bonds' conditions irrespective of the income the bond issuer receives on the activities they delivered with the finance the bonds raised. Bonds can be issued by private sector organisations of scale, or public sector organisations with borrowing powers (such as local authorities).	
Used by Private sector (incl. households)	Yes (corporate)
Used by public sector	Yes
Source of direct finance	Yes
Tool to 'crowd-in' or support low cost private sector capital	No
How well developed in market (1- little or no; 3- strong)	2
Further considered in this report	No
Suitability to finance energy efficiency and ZDEH: might be useful for larger organisations, including local authorities, although requires a sufficiently large	

pipeline of deliverable projects to make it cost effective. Scottish Government currently has limited borrowing powers and is unlikely to utilise bonds in any meaningful way to finance ZDEH installations.

Revolving Loan Funds	
Summary description: public sector lead mechanism whereby individuals or businesses apply for funding in the form of a loan, which is then repaid over time, providing a repayment stream to replenish the fund for future funding rounds. Potential to attract additional third party (private) money to increase the scale of the fund.	
Used by Private sector (incl. households)	Yes
Used by public sector	Yes
Source of direct finance	Yes
Tool to 'crowd-in' or support low cost private sector capital	Yes
How well developed in market (1- little or no; 3- strong)	1
Further considered in this report	No
Suitability to finance energy efficiency and ZDEH: a form of co-investment mechanism that could attract larger scale institutional investment and offer scope to aggregate loans (coupled with frameworks for installation, quality assurance and service standards). Funds could be structured and focused in a way to support policy goals.	

Fiscal mechanisms	
Summary description: not a direct form of financing, rather the use of taxation to incentivise desired behaviours. It could encourage investment by providing monetary benefits to undertake works, or alternatively penalise those who do not adhere to the encouraged behaviour (the latter potentially then providing funding to subsidise retrofit programmes). Could include taxation powers such as Land and Building Transaction Tax for domestic properties or Non-Domestic Rates for non-domestic properties.	
Used by Private sector (incl. households)	Yes
Used by public sector	Yes
Source of direct finance	No
Tool to 'crowd-in' or support low cost private sector capital	No
How well developed in market (1- little or no; 3- strong)	1 (to incentivise ZDEH)
Further considered in this report	Yes
Suitability to finance energy efficiency and ZDEH: taxation is widely used internationally to promote behavioural change in line with a government's objectives and could, in theory, encourage people to retrofit their properties, although limitations on the Scottish Government's taxation powers may constrain the potential effectiveness of fiscal levers in Scotland.	

Guarantees and First Loss Capital	
Summary description: public sector support through use of guarantees, or first loss capital, in a Joint Venture or co-investment vehicle, with the aim of reducing risks for private sector finance providers sufficiently to encourage them to offer relevant funding to individuals and/or businesses. First loss capital is where the Scottish Government accepts the risk of covering a given level of loss (or non-repayment) before other fund financiers suffer any loss, thus reducing the risks they face in offering finance. It may help de-risk the financing of early stage market development.	
Used by Private sector (incl. households)	Yes
Used by public sector	Yes
Source of direct finance	Yes
Tool to 'crowd-in' or support low cost private sector capital	Yes
How well developed in market (1- little or no; 3- strong)	1
Further considered in this report	Yes
Suitability to finance energy efficiency and ZDEH: as an immature market, government guarantees and/or uses grant as first loss capital. Could provide a means of crowding-in larger scale amounts of private capital, which can offer an overall lower financing cost for borrowers than purely private capital could, if private providers had to accept all the risk themselves.	

There follows a discussion of the key mechanism, drawing on products highlighted in the tables above, which individual building owners may be able to use to invest in ZDEH systems and energy efficiency improvements. We offer the Taskforce's views on the opportunities for growth that may exist, if those barriers highlighted in the next section can be addressed.

5.2 Traditional Self-Financing (including unsecured loans)

There is a wide range of unsecured loans available through retail banks and building societies, and interest rates can vary significantly depending on circumstances. Unsecured personal loans are typically used to borrow relatively small sums of money and access to them will be influenced by an individual's credit rating. In the current market, however, they are not widely used for financing energy efficiency and ZDEH installations. This is partly because the Scottish Government provides a range of interest free and low cost loans to various building owners, and, although there has been demand for these Scottish Government products, the Taskforce understands that this has not been at significant enough scale to meet Scotland's emission reduction targets. This limited demand also helps to explain the low interest in utilising traditional unsecured finance products for ZDEH solutions.

Private sector loans are also available to businesses, including a range of 'green loans', in a similar way to personal loans for individuals. These 'green loans' enable businesses to invest in a range of environmentally sustainable improvements, with repayment terms echoing those of standard business loans. The Taskforce does not

believe these 'green loans' are widely utilised in Scotland as SMEs are able to access a loan of up to £100,000 from the Scottish Government, with the zero per cent interest offered on the SME Loan Scheme being better than companies could achieve through commercial lenders. Again, low demand from businesses for energy efficiency and ZDEH works, when considered along with the range of competing demands on business finances, is likely to substantially explain low uptake of privately provided loan funds that do exist.

5.3 Taskforce View on Current Use and Potential Development

Who can currently access them – in theory, traditional self-financing products, such as unsecured loans, are available to everyone, although will be subject to a satisfactory credit check and the repayments being affordable.

Repayment of a personal loan is typically over a one to seven year period, a much shorter repayment period than for mortgage additional borrowing (the main alternative source of home improvement finance). A personal loan will, therefore, generally have higher monthly repayments than mortgage finance, so will only be a suitable source of financing energy efficiency or ZDEH solutions where the overall costs of the upgrades do not lead to prohibitively high monthly payments. Households with low income levels are, therefore, unlikely to find personal loans an attractive financing option, even if they were to pass credit checks. This will rule out many property owners that are in or at risk of fuel poverty, as well as many older householders where individuals are retired or are planning to retire.

Despite the higher interest rate associated with personal loans, a personal loan can cost less than mortgage additional borrowing over the full lifetime of the loan due to its shorter term. Personal loans used for financing a specific good or service also benefit from robust consumer protections under the CCA. Personal loans are also an appropriate source of finance for the approximately 50% homeowners in Scotland that do not have a mortgage.

Personal loans could, therefore, offer a realistic financing option for approximately 1.4 million property owners in Scotland, this representing approximately 55% of overall domestic dwellings. Notwithstanding, such loans would not generally be suitable for more expensive retrofitting works and their attractiveness would be influenced by the terms of a loan compare to alternatives.

While a range of privately provided 'green loans' is available for business, these are only likely to be attractive to a smaller proportion of Scotland's businesses at present. A private loan is only likely to be a suitable option where the total costs of a project exceed the level of interest free loan available through the SME Loan Scheme, or where a company is not classed as an SME. As at March 2022, there were an estimated 360,910 private sector businesses operating in Scotland. The vast majority of these businesses (98.3%) were small (0 to 49 employees). A further 3,835 businesses (1.1%) were medium-sized (50 to 249 employees) and 2,340 businesses (0.6%) were large (250 or more employees)²⁸.

²⁸ [Scottish Government Statistics: Businesses in Scotland 2022.](#)

How traditional loans might evolve to support ZDEH solutions – there is currently a large array of green loans available in the market for businesses, however, there are very limited domestic products, which are distinguished from ordinary unsecured loans.

There are currently several key barriers limiting the green home loan market in the UK, the main limitations stemming from the CCA and operational challenges. On the latter, a personal loan journey has become streamlined, is often digital-only, and has limited after-sales interaction for the consumer. Assessment of the use of funds adds an additional layer of complexity to a personal loan journey, making it more challenging for a lender, although integrating into a supplier’s platform through “point-of-sale” finance can help streamline this process.

In the short-term, at least, it seems unlikely that there will be any substantial development of personal loans for domestic property owners, notably those focused specifically on investing in environmental sustainability measures. However, traditional personal loans for any purpose could still help individuals bridge any small gaps in the costs of enhancements relative to the scale of public support available.

The Green Finance Institute (GFI) launched the Green Home Finance Principles (GHFPs) a framework of guidelines to support the allocation of finance towards retrofitting works in the UK’s domestic buildings²⁹. Broader adoption of these principles could support the development of new products along the lines outlined above.

GFI role in supporting development of Green Home Improvement Personal loans

Personal loans are a form of credit that are regulated in the UK under the CCA 1974. Some sections of the CCA (particularly sections 56 and 75) lead to significant risks for lenders developing green personal loans as they cause a lender and supplier to be equally responsible for any purposeful or accidental mis-selling, mis-representation, or breach of contract.

As already noted, the potential impact of sections 56 and 75 on green home finance was realised in the UK during early lender activity financing solar panels. Various factors, including a lack of consumer understanding, have led to billions of pounds in liabilities and contingent liabilities still being held on lender balance sheets today. A continuing legacy arising from this time has been a perception by lenders that energy efficiency and ZDEH solutions represent a prohibitively costly risk for to them.

CCA reform is widely considered to be the most critical catalyst for large-scale green personal lending. The UK Government has committed to reforming consumer credit protection laws, and the GFI has been actively supporting and engaging with this reform. However, the length and complexity of the CCA means that reform is expected to take several years and the outcome is uncertain. Nevertheless, de-risking mechanisms that facilitate the rapid development of green loans remains of key importance.

²⁹ [Green Home Finance Principles \(greenfinanceinstitute.co.uk\)](https://www.greenfinanceinstitute.co.uk)

There are potential market opportunities for risk-management mechanisms that support the development of green loans including:

- consistent standards across SME contractors through audited work to help prevent claims; and
- the involvement of the insurance industry for risk management and mitigation insurance that can spread the risk for lenders and suppliers.

The GFI has identified potential risk-management and mitigation solutions with leading market actors and is continuing to actively work cross-sectorally with key stakeholders to develop these solutions. Development of these solutions has the potential to unlock a substantial UK personal loan market for energy efficiency and ZDEH solutions.

5.4 Green Loans or mortgages (secured lending)

Overview – one common area for green home financing is a green mortgage, whereby a bank or mortgage lender offers home owner preferential terms, if they can demonstrate that the property for which they are borrowing meets, or will meet through retrofitting measures, certain environmental standards.

The GFI has been working closely with industry to stimulate growth within the green mortgage market; with just four green mortgage products available in 2019 – when work on the GFI’s Green Mortgage Hub³⁰ started – there are now over 60 green mortgage products available from 38 different lenders. These offer a variety of incentives and product features for purchasing, remortgaging an already energy efficient home, as well as a suite of products that allow additional funds to be raised for retrofitting. These span both the owner-occupier and buy-to-let (BTL) sectors.

There are currently two main categories of ‘green mortgage’ available on the market. Firstly, products that incentivise through product features such as a discounted rates (typically 0.05 – 0.10%) or by means of cashback of typically between £500-£2,000 (for existing customers that have carried out energy efficient improvements on the security property). Secondly, products based upon enhanced affordability for energy efficient properties, where additional funds of typically up to £25,000 are available to borrow for these purchases, giving potential buyers greater buying power when searching for a property if considering an energy efficient property versus a less energy efficient property.

More widely, as of January 2023, according to Money Facts³¹ there were 533 ‘green’ mortgage products³² (as labelled by lenders) available on the market from both high street and specialist lenders. This included loans for landlords and so-called ‘second’ loans, where a mortgage is extended to provide capital for energy efficiency upgrades. The Intermediary Mortgage Lenders Association (IMLA) in its report on Green Mortgages in 2020, stated that these types of mortgages, although in their

³⁰ [Green Mortgages \(greenfinanceinstitute.co.uk\)](https://www.greenfinanceinstitute.co.uk)

³¹ [Will 2023 be the year of green mortgages? - FTAdviser](#)

³² Money Facts’ figures include the number of rates available for each green mortgage product

infancy, are a growing part of the UK financial service sector, and that 14% of brokers have had clients that have enquired about or taken out a green mortgage that offers some type of incentive to customers to invest in energy efficiency improvements as part of taking out a mortgage³³.

Currently, many green mortgage products that constitute a main mortgage do not offer a significantly lower interest rate than their traditional counterparts, despite emerging evidence that there is a lower credit risk associated with borrowers owning energy efficient properties. As the market is currently considered niche, the competitive effect of suppliers competing for customers, and, thereby, driving down prices is limited, and customers' decisions on which mortgage products to select, are strongly correlated with costs. This is understandable, particularly given the other large outlays associated with purchasing a property, as well as the wider cost pressures faced by everyone due to current high inflation (and increasing interest rates).

However, finance providers are increasingly exploring the appetite of existing mortgage customers to access additional secured borrowing to fund green improvements to their home. These additional loans generally offer better interest rates than those available through either traditional loans or for full mortgages, with some offering zero per cent interest currently available³⁴.

The Bank of England has increased base rates steadily from 0.1% in December 2021 to a level of 5.25% by September 2023. This is likely to have an impact on the housing finance market over the coming year as the higher base rate feeds through into higher interest rates for new mortgages. This would be expected to make consumers even more sensitive to costs when determining which mortgage to take out, suggesting challenges in growing the demand for green mortgages if they do not offer the most competitive overall package for individual property purchasers needs.

5.4.1 Taskforce View on Current Use and Potential Development

Who can currently access them – similar to personal loans, green mortgages (and associated secured lending) are available to all private property owners, subject to individuals receiving a satisfactory credit check, repayments being affordable and having sufficient equity within the property. This applies to private rented landlords as well as owner occupier housing. Again, many older householders, as well as those living in fuel poverty, are unlikely to be attracted to green mortgages as repayment may be unaffordable for such individuals.

Green mortgages can offer an attractive financing model for those able to afford the repayment and who are looking to install ZDEH systems or energy efficiency upgrades. There are, however, other solutions, such as unsecured finance, that provide alternative options which should be assessed individually based on the borrowers' financial circumstances. While a benefit of a green mortgage is to spread the cost of raising additional funds over typically a longer period, and at a lower interest rate when compared to an unsecured personal loan or credit card, a

³³ [imla-green-mortgages.pdf](#)

³⁴ [Green Additional Borrowing | Nationwide](#)

mortgage would, typically, mean more interest would be paid over the term of the product and also may not be available for older householders, those already in fuel poverty, or those who may be behind with their bills, which would impact their eligibility for mortgage products.

As repayment for secured loans can, generally, be added to a customer's remaining mortgage period, they offer an opportunity to spread the costs out over a number of years, and, therefore, have potential to help fund work requiring more substantive upfront costs.

Full mortgage products badged as 'green mortgages' are sometimes only available to homes that are already highly energy efficient. If this is taken to mean properties with an EPC rating of band B or better, it could potentially offer an option for approximately 85,000 properties across the owner occupier and private rental sectors (out of a total 1.95 million properties in these sectors).

How mortgages and loans might evolve to support ZDEH solutions – the increased availability of secured loans for energy efficiency or ZDEH works, alongside traditional mortgage products, could be a natural growth area if demand for heating enhancements increases substantially. This may even include the total value of mortgage and secured loan exceeding the maximum loan to value ratio which a bank would lend a traditional mortgage against, therefore opening up the possibility of green additional secured borrowing for homeowners who are unable to put down larger deposits, or who have not built up substantial equity in their property.

As the market matures and risks are better understood, we would anticipate that the interest rates charged on the green mortgage or secured loan would be better than the interest charged on a traditional mortgage. This would be driven by competition between providers, as well as more data to validate emerging indications that there are lower rates of credit default amongst households which invest in energy efficiency measures³⁵. Greater demonstration of supply chain capacity and sufficient skilled installers, along with established standards and quality assurance over work carried out, would also help reduce the perceived risk which is currently priced into many green finance products.

On its own, though, the savings from a lower interest rate for a green mortgage product compared to a traditional mortgage (which does not require any green upgrades) may not be significant enough to induce an individual to install upgrades, as the cost of the upgrades are likely to be greater than the level of repayment savings between green and traditional mortgages.

Increased competition between finance providers could lead to a greater availability of secured loan 'second charge' products to individuals, even if their main mortgage is with another provider. About 50% of lenders now offer green mortgages and 98% indicated they will offer them in the near future³⁶. As demand is expected to ramp up in the second half of the current decade, many banks are currently developing green

³⁵ [Article by the Bank of England on whether energy efficiency predicts mortgage performance](#)

³⁶ [Article on how Green Mortgages are changing the mortgage market](#)

mortgages and loan products with the aim of testing and refining them before scaling them up in the coming years.

This is a promising development and one which is worth monitoring going forward. With many lenders choosing to develop green mortgage products using the GFI's 'Green Home Finance Principles' as a framework and voluntary code of conduct, this is bringing structure and integrity to the market as it continues to grow at pace.

Green mortgages could also evolve to become available to property owners not currently living in very energy efficient properties, with cash or interest rebates for installing agreed energy efficiency or ZDEH measures.

GFI activity to foster development of green mortgage market

Green mortgages are a key financial mechanism for connecting homeowners with the finance required to achieve the UK's Net Zero ambition through decarbonisation of housing stock. Scaling this market requires proactive, sustained, and tailored market interventions, such as the GFI's green mortgage campaign, which has directly supported growth in the green mortgage market from four to over 60 products within just four years.

Understanding how greater competition would drive innovation, whilst identifying that lenders were hesitant to launching green products due to a perceived risk of 'greenwashing', the GFI developed the Green Home Finance Principles to strengthen the integrity of the market and provide the clarity and framework required by lenders during the product design, development and marketing and process.

Resources to inform commercial decision-making on green mortgages were lacking in 2020. Lenders shared frustrations over the lack of widely available information, which they did not have capacity to individually compile. This caused a slowdown of innovation. Responding to this need, the GFI launched the Green Mortgage Hub and Lenders' Handbook on green home technologies, a comprehensive guide to inform financial institutions and industry about retrofit technologies and funding options.

Recognising that mortgage brokers play a vital role in the market, with 82% of all mortgage origination being intermediated, and in response to demand from leaders in the intermediary market, the GFI also published the Brokers' Handbook on green home technologies, in collaboration with several finance and retrofit trade bodies, to help educate and raise awareness of energy efficiency and green mortgages amongst the intermediary sector.

The GFI continues to work closely with the mortgage industry, including mortgage lenders, as well as broader stakeholders such as surveyors and valuers, regulators and mortgage sourcing systems, to ensure that the market continues to grow, diversify and provide financial mechanisms and education to homeowners.

5.5 Equity Release Mechanisms

Overview – of the approximate 100,000 house purchases made per year in Scotland, almost 34,000 are mortgage-free transactions, accounting for £7.6 billion³⁷, a segment of the housing market for which green mortgage products are not relevant, as these largely relate to older people who have already paid off their mortgages.

Equity release products enable property owners that own their property outright, and are over 55 years of age, to utilise equity in their property to secure a long-term loan. The equity release loan can then be used to fund energy efficiency improvements, although there are currently very few products available in the market that specifically target equity release for green home improvement.

Equity release allows the property owner to release tax-free cash without needing to move out or make monthly repayments. Third party financing is provided to the borrower in exchange for the funder taking an equity stake in the property and may be particularly relevant for mortgage-free owners. The financing is repaid on sale of the property. Such mechanisms can be used in many ways, including to boost income in retirement, pay for caring needs, or to transfer some wealth to children while still alive.

There are two existing types of equity release: Lifetime Mortgages and Home Reversion Plans. Lifetime Mortgages are mortgages (loans) that do not have to be repaid until the property is sold, although individuals may choose to make regular repayments on the interest to reduce the compounded interest payments that would be applied at point of sale, alongside repayment of the mortgage amount borrowed. A smaller proportion of equity release loans are accounted for by Home Reversion Plans, which allow the property owner to sell a proportion of the property, for less than the market value of the portion sold, while continuing to reside in the property. The finance provider receives their cut (or equity stake) when the property is sold.

Equity release products are not, however, suitable for all, and professional advice is required before taking out any equity release mortgage to ensure people understand the downsides and how they relate to their individual circumstances³⁸. An important risk to understand with Lifetime Mortgage equity release products is the potentially significant interest costs a person's estate may have to pay upon settlement of the agreement. This is because interest compounds and can build up substantially if doing so for several years. Making monthly interest repayments can help reduce the level of compounded interest due upon settlement, while only drawing down the agreed equity release money as required will also help, as interest is only compounded on the money actually borrowed.

Raising less than the market value for the proportion of a property put into an equity release product is an important downside for people to consider with Home Reversion Plans (where interest is not charged, as the provider is not offering a loan, rather taking an ownership stake in the property). The lump sum released may only

³⁷ [Long term statistical review of the Scottish property market 2022-2023, Registers of Scotland](#)

³⁸ [How equity release works and risks involved - MSE \(moneysavingexpert.com\)](#)

be about half the market value of the property, even though the equity provider is entitled to the proportionate market share of the property when it is sold. For example, selling a 20% equity share in a property valued at £200,000 might only raise £20,000, while the provider would be entitled to £44,000 if the property was eventually sold for £220,000. The reason for the large discount on market value raised by equity release is because the provider, typically, has to wait several years to get money back, while the discount also protects the provider from negative equity if the value of the property upon sale is less than when the equity was released.

5.5.1 Taskforce View on Current Use and Potential development

A possible source of expansion for equity release products could be to grow the market for equity release products, with a specific focus on enabling investment in energy efficiency and ZDEH systems. The use of such products for decarbonising homes could offer significant benefits in both energy cost savings, as well as making people's homes warmer and more comfortable to live in, alongside the potentially improved health benefits that arise from this. Consumers could also benefit from the stability of a long-term fixed interest rate with no monthly interest payments.

The Taskforce is aware that there is an increasing demand for later life (for those over 55) lending that can allow consumers to achieve various goals, and includes the following:

- covering long-term care costs;
- carrying out home improvements, essential household repairs and adaptations;
- consolidating burdensome debts; and
- reducing working hours or the funding of earlier retirement.

Making homes more warm, comfortable and Net Zero could be an additional use for homeowner equity.

5.6 Green Leases or Rental Agreements

While not an actual financing mechanism, green leases in the private rented or non-domestic sector are a way to overcome the split incentive barrier discussed in section 4.2.4, by means of including 'Green Lease Clauses'³⁹ in tenancy agreements, which enables the landlord to recover the costs of retrofitting based on the predicted energy savings they will generate.

Existing UK legislation currently constrains what is possible with green leases domestically, as it prevents landlords from charging variable rents or from splitting the energy savings between landlords and tenants. This means that energy alignment clauses are not possible in the UK at present. Notwithstanding, there may be scope to incorporate a type of heat as a service into rental agreements, whereby the tenant pays a fixed monthly cost for rent and services, including energy. It is perhaps worth noting that encouraging behavioural changes in tenants, so as to use energy efficiently, is a challenge associated with such models.

³⁹ [Green Lease Toolkit | Better Buildings Partnership](#)

In respect of the potential role for green rental agreements in helping transition to ZDEH solutions, further work is required to better understand what delivery models are possible within the UK, as well as what the attitude of landlords and tenants would be to different models.

While small overall, green leases are becoming more common in the non-domestic sector, with many drawing on the Better Building Partnership's Green Lease Toolkit. Lessons⁴⁰ from their development in a non-domestic setting – which may be transferable to domestic properties – may form part of any future exploration of their potential.

5.7 Property Linked Finance

Property Linked Finance (PLF) is not currently available in the UK, although could, in the future, support homeowners by funding up to 100% of the upfront costs of energy efficiency improvements, with the unique characteristic that the finance is 'linked' to the property, rather than the property owner. A comparable finance mechanism available for home upgrades in the United States has, to date, mobilised over \$13 billion of financing towards energy efficiency improvements across 344,000 homes, and 3,100 commercial buildings, creating almost 200,000 skilled job years⁴¹. PLF may provide an innovative and scalable financial mechanism, which could potentially mobilise capital towards retrofitting upgrades.

This solution will be particularly relevant for the owner-occupied and private rental sector, where tying the financing of ZDEH measures would result in the benefits and any associated financing costs of Net Zero installations being passed to whoever owned the property at a particular point in time.

The GFI (as one of the Taskforce members) is pioneering the UK's efforts to launch a PLF scheme, collaborating with some of the UK's largest financial institutions to establish a prototype solution. The GFI has undertaken research showing that there is appetite from consumers for a PLF-type scheme, both in stable and rising energy price environments⁴². The Taskforce therefore believes that this mechanism merits further research and exploration, in collaboration with the GFI, in terms of: defining the legal process of linking finance to a property; developing an operational business model; as well as the customer journey, regulatory treatment, housing market implications, and integration with the retrofit supply chain.

⁴⁰ [Green Lease Essentials - Better Buildings Partnership](#)

⁴¹ [PACE financing and its impact in the USA](#)

⁴² [Property Linked Finance: Rising Consumer Demand for Energy Efficiency and the Need for Financial Innovation by the Green Finance Institute](#)

GFI role in exploring potential of PLF in UK

Energy efficiency in the built environment has long been a challenge, and the current energy crisis has worsened the situation, thereby increasing the urgency to act. PLF has the potential to help address this challenge.

To understand the UK's appetite for PLF, the GFI surveyed 1,800 UK homeowners between 2021-22. The GFI's 2021 research found encouraging levels of demand for PLF with 63% of respondents stating they were likely or neutral to using PLF – an encouragingly positive response to a new financial solution. Of those who were open to using third-party finance for energy efficiency, 73% supported the proposed scheme. Over half the respondents stated that future socio-economic pressures would probably make them more likely to consider using PLF, particularly amongst landlords and younger people.

Based on the positive response from UK consumers, the GFI has developed a mechanism to 'link' PLF to the property, and engaged extensively with market experts to inform an early model for UK PLF schemes. The GFI will also work with financial institutions to further develop the PLF model and catalyse pilot projects across the UK.

5.8 Fiscal Incentives

Fiscal incentives are not private sector mechanisms, such as those discussed above. They could, however, form part of a range of measures to encourage the installation of ZDEH, and have been utilised in other countries.

Such fiscal incentives can complement regulations by influencing both the demand and supply sides, given that tax-based incentives have long been used to drive behaviour and purchasing decisions across many markets. While Scotland does not currently have full control over all fiscal powers, property-based taxation such as Council Tax or Land and Buildings Transaction Tax (LBTT) can offer the potential to incentivise behaviour and encourage individual action in relation to decarbonisation. The use of wider fiscal powers – for example, the treatment of VAT on energy efficient works or ZDEH – is something that can only be considered on a UK-wide basis.

The Taskforce would therefore like to see the Scottish Government explore those areas where it does have devolved powers (e.g. LBTT) more fully, where it is able to do so, as well as to work with the UK Government to look at other areas, such as VAT or capital allowances, that are reserved.

6. Conclusions and Recommendations

6.1 Fostering Market Development

The Scottish Government has made a £1.8 billion capital commitment over this Parliamentary session (excludes future funding and financial commitments that may arise) to support decarbonising heat in Scotland's buildings. This sits against an estimated total cost in excess of £33 billion to green Scotland's buildings by 2045. As such, it is imperative that this public investment is used to effectively leverage as much private investment from alternative sources as possible. Private sector investment will need to play a crucial role in financing the transition to ZDEH and improving overall energy efficiency of buildings.

While this is a substantial sum, considering the scale of private sector institutional finance in the UK helps place it into context in terms of the overall size of a potential green financing market. For example, in 2021 a number of large UK pension funds, owning assets worth £870 billion, committed to cutting the emissions of their portfolios to Net Zero⁴³. These funds only account for a proportion of the UK pension fund market, which in turn is only part of the wider financial markets based in London. This suggests that the scale of potential private investment required to achieve Scotland's Net Zero heating targets could be provided through existing financial markets. Unlocking that private investment potential and channelling it to support energy efficiency and ZDEH is, however, the challenge, and one this Taskforce has been exploring.

An important conclusion of this Taskforce is that, as a relatively new area in need of scaled investment, the financing market for energy efficiency and ZDEH has yet to meet its full potential. Challenges discussed earlier in this report explain some of the reasons why the market is still in its infancy. However, coordinated and collaborative action across government, public and private sectors, can reduce these barriers and foster growth in a market which can unlock the scale of private investment required.

Our recommendations are, therefore, primarily focused on creating the conditions to foster and grow an effective finance market in Scotland for energy efficiency and ZDEH solutions, particularly for individual property owners. Doing so will enable investors to offer finance with confidence and for consumers to more easily access the financing they require.

6.2 Recommendations

In exploring possible financing solutions to tackle some of the specific barriers and gaps described earlier, the Taskforce has sought to understand the particular challenges and offer practical and deliverable solutions to address these.

Figure 6-1 below summarises our general approach to this work. It is worth noting that in reaching our conclusions, the Taskforce has sought to make recommendations that can either complement or supplement existing financing

⁴³ [Major UK pension funds worth nearly £900bn commit to net zero | Pensions industry | The Guardian](#)

mechanisms, as well as provide novel approaches that ensure financing can overcome particularly difficult barriers. These may include supporting market growth of existing financing products that are relatively new, direct interventions that may overcome specific barriers, or potential solutions that would benefit from further development and demonstration. The aim of all these recommendations is to foster an environment that enables a range of products to be delivered at scale to finance energy efficiency and ZDEH measures, as there will need to be a mix of financial options overall to meet the varying circumstances of different individuals and businesses.

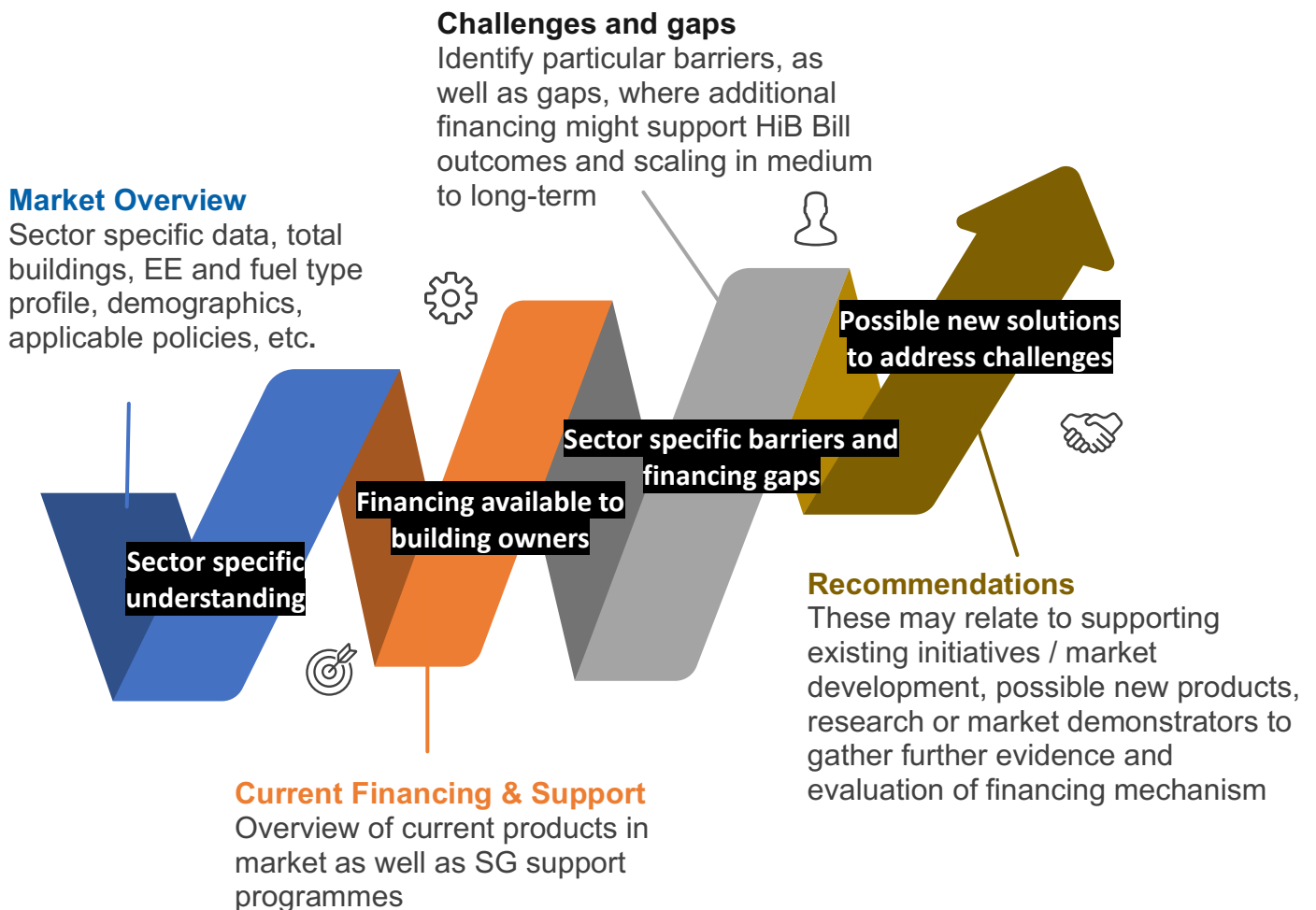


Figure 6-1 Summary of Taskforce recommendation process

Having considered the current structure of the built landscape in Scotland, reviewed current financing options, and explored the challenges constraining the growth of these products, the Taskforce is making nine recommendations for the Scottish Government to take forward in partnership with private sector organisations and other levels of government in relation to the areas discussed in this Part 1 Report. These are summarised in Figure 6-2 below, with our rationale for each recommendation set out below.

Develop blended co-investment investment vehicles

With support of the SNIB, SFE and SFT, identify where and how to best test a blended finance approach to finance ZDEH

Work with Equity Release Council

Develop an information framework and guidance for Green Retrofit Equity Release products

Research on Property Linked Financing in Scotland

Work with GFI to explore potential to establish a scalable demonstrator of mechanism

Review of available SG fiscal levers

Explore the scope to use of LBTT or Council tax to incentivise ZDEH upgrade

Green lease / rental agreements

Identify opportunities to pilot the use of green rental agreements to encourage retrofitting rented properties

Non-Domestic Rates system

Review how NDR can better support- and encourage ZDEH installations

Map heat in building data gaps

Establish a framework to promote open data sharing to address current gaps

Expand current market engagement

Work with GFI, SFE and other to expand engagement with brokers and quantity surveyors to promote and expand awareness of public for green financing products

Co-ordination with UK Government

Seek to influence UK Government and regulator policy to encourage installation of ZDEH solutions

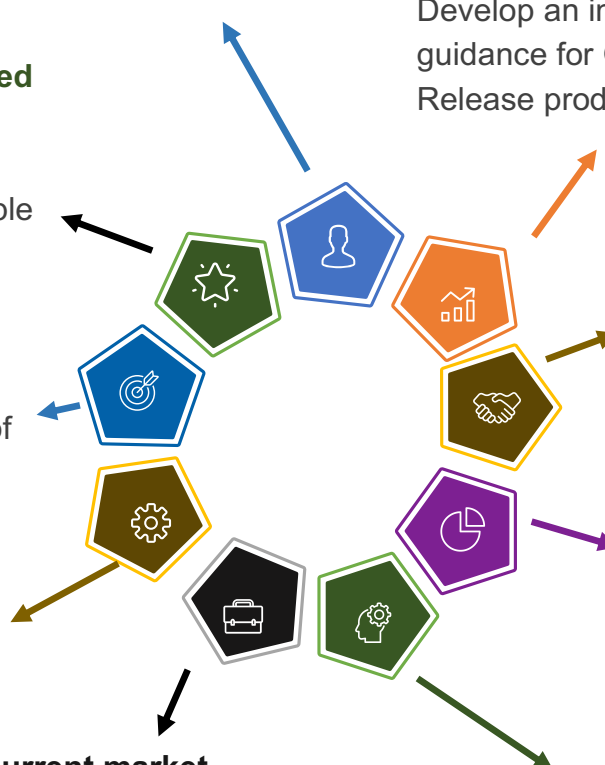


Figure 6-2 Summary of Taskforce recommendations

It should be noted that much of the work needed does not necessarily relate to the creation of novel financing solutions, rather, for the Scottish Government, in partnership with others, to nurture a thriving market for green finance products. This will need to be underpinned by coordinated activity around key pillars like regulation, quality assurance standards, a well skilled and knowledge supply chain, and clear consumer protection measures. These wider features will need to be developed in parallel and will work in combination to stimulate demand for energy efficiency and

ZDEH measures. That demand stimulation will, in turn, provide the confidence and delivery structures necessary to support scaling up of financing products.

6.3 Recommendations and How They Address the Identified Challenges

1. Recommendation

Scottish Government should encourage, from early 2024, increased market-customer engagement and communications – working with the Green Finance Institute, the finance sector through Scottish Financial Enterprise and other interested parties, to raise awareness of existing green finance products (particularly green mortgages and unsecured loans) with mortgage providers, distributors, brokers and quantity surveyors, and to further explore options for expanding the range of products available.

Taskforce Thinking

There are strong market drivers for financial institutions to grow green mortgage products arising from ESG requirements, potential mandatory reporting of EPC portfolios, as well as use of ‘green mortgage labels’ that may attract cheaper financing costs for banks. From a non-domestic perspective, there is a range of commercially available green finance products, although many businesses may be unaware of them, particularly amongst SMEs.

This recommendation looks to more fully raise awareness and understanding of green finance products amongst relevant professionals who form key relationships with homeowners, borrowers and businesses, and who can, therefore, support individuals and businesses in navigating the finance landscape for energy efficiency and ZDEH systems. It will also be important that lessons from smaller scale testing of green finance products are captured and used to inform subsequent product development. This includes where government action or messaging can help underpin a growing green finance market. Effective two-way channels of communication and engagement between government, customers and green finance professionals will therefore be required.

This recommendation will help address challenges discussed in section 4 of this report, specifically –

4.2.1 – Finance demand constraints and challenges; complexity of making the right investment

4.2.5 – Finance demand constraints and challenges; lack of promotion of green mortgage products

2. Recommendation

Scottish Government should begin work early in 2024 with the Equity Release Council to develop an information framework and guidance – alongside associated codes of conduct for expansion of these products by institutions – for the purpose of installing zero direct emission heating solutions, as well as the necessary building fabric improvements.

Taskforce Thinking

This recommendation will potentially unlock some of the equity lying in approximately 1.2 million homes for homeowners over 55 years old, who may have limited annual earnings, but value within their property. This may encourage greater involvement of the finance sector in developing and promoting green equity release products, of which there are currently very few.

There is market interest in developing new equity release products, including those which enable investment in measures to improve the environmental sustainability of homes. However, equity release is not a widely understood mechanism by the public at large and it is important that people considering equity release can get a clear understanding of any products they might be able to access. There are also some barriers which can limit private lenders' willingness to offer equity release products to some properties, particularly if there are risks of negative equity or non-standard leaseholds. Clarifying which types of properties are suitable for equity release, coupled with consistently articulating the features of any products, will help build awareness of equity release as a viable financing option for some households.

To avoid all market participants developing their own guidance on equity release, and, thereby, making the overall landscape more complex and confusing for potential customers, this recommendation encourages the development of a coherent framework – drawing on existing industry best practice, such as the GFI's Green Home Finance Principles and work of the Equity Release Council – which all parties can then work towards consistently.

This recommendation will help address challenges discussed in section 4 of this report, specifically –

- 4.2.1 – Finance demand constraints and challenges; complexity of making the right investment
- 4.2.5 – Finance demand constraints and challenges; lack of promotion of green mortgage products

3. Recommendation

Scottish Government should support the development of blended co-investment vehicles (blended financing) – with the support of the Scottish National Investment Bank, Scottish Financial Enterprise and Scottish Futures Trust. By the end of 2024 it should identify the most suitable focus and delivery structures that will help facilitate the joint deployment of public funding alongside private sector capital.

Taskforce Thinking

This recommendation supports reducing early market risk for a given aspect of infrastructure, either at an individual property, or at a communal based level. Co-investment vehicles may be particularly well suited for: facilitating larger scale investment; enabling public funding to readily ‘crowd-in’ private sector capital; and potentially providing a blended cost of finance that would be cheaper than otherwise available as it can pool resources, share expertise and spread risk between parties.

It can also create a scaled source of finance by ‘crowding-in’ private capital, which would otherwise not be offered at affordable levels by the private sector. This can be possible if public funding can be utilised to help de-risk the investment for other parties, for example, by taking a first loss capital role, or by blending public grant and/or commercial capital with private capital.

Whilst we see co-investment as having a role in the future heat in buildings finance mix, it is not a product that can be deployed in isolation, as it would need to be applied to a sector of the housing market and/or type of ZDEH measure technology deployment, most likely as part of a wider programme. The form of the co-investment vehicle, including its legal structure, would vary depending on the purpose of the fund.

This recommendation therefore encourages the Scottish Government to capitalise on the support and expertise of partners in Scotland (like the Scottish National Investment Bank) and at a UK level (like the UK Infrastructure Bank) as well as utilising insight from the private sector through SFE, to assess what blended finance vehicles are best suited to increasing demand for and support of ZDEH solutions and energy efficiency upgrades.

This recommendation will help address challenges discussed in section 4 of this report, specifically –

4.1.3 – Financing supply context and influences; green taxonomy

4.1.5 – Financing support context and influences; challenges constraining financial sector provision of finance

4. Recommendation

Scottish Government should collaborate with the Green Finance Institute to research the viability of Property Linked Finance in Scotland, with a view to developing a scalable demonstrator of the mechanism by the end of the current Scottish Parliament in 2025.

Taskforce Thinking

This recommendation is about exploring the scope for financing to be linked to the property, rather than the property owner, within Scotland. This would result in repayment requirements transferring to a new owner when a property is sold. This means that whoever owns the property and benefits from the energy efficiency and/or ZDEH measures, is responsible for any repayments associated with their installation.

The PLF mechanism could help overcome a barrier, whereby people are reluctant to invest in measures with a long payback period if they are not certain they will be living in a property over a longer timeframe, and may not, therefore, realise the full benefit of the measures during the time they remain in the property.

While there is potential for PLF to form part of the overall financing mix for energy efficiency and ZDEH solutions, it is not currently available in Scotland. Further investigation is therefore required, in collaboration with the GFI which is actively developing this solution for the UK market, to identify where and how it might be applied in Scotland, as well as what supporting structures would need to be in place to foster the development of a PLF market.

This recommendation will help address challenges discussed in section 4 of this report, specifically –

- 4.1.5 – Financing support context and influences; challenges constraining financial sector provision of finance
- 4.2.2 – Finance demand constraints and challenges; perceived impact on property value
- 4.2.6 – Finance demand constraints and challenges; legislative barriers

5. Recommendation

Scottish Government should review and publish, by the end of 2024, the scope to utilise fiscal levers and taxation policy in Scotland to facilitate and accelerate the installation of zero direct emission heating solutions and energy efficiency measures.

Taskforce Thinking

While we recognise that the Scottish Government does not have full control over fiscal levers, it does have control over a range of taxation measures, including Land and Buildings Transactions Tax (LBTT) and Council Tax, which offer the potential to influence home owner and purchaser decisions around investing in energy efficiency and ZDEH solutions. Using these levers is one potential route to increasing demand levels for retrofitting properties.

This recommendation recognises that taxation levers have been used in some other countries to incentivise private retrofitting investment. It also highlights that there is merit in further exploring the degree to which fiscal measures could be used in Scotland, which levers could be most effective, and how they might be deployed in practice. This is in line with the Scottish Government's 2021 Heat in Buildings Strategy, which committed to considering how local tax powers like Council Tax could be used to incentivise and encourage retrofitting of buildings.

This recommendation will help address challenges discussed in section 4 of this report, specifically –

4.2.2 – Finance demand constraints and challenges; perceived impact on property value

4.2.3 – Finance demand constraints and challenges; poor financial returns

4.2.6 – Finance demand constraints and challenges; legislative barriers

6. Recommendation

Scottish Government should review and publish an analysis, by the end of 2024, of how non-domestic rates reliefs can better support and encourage investment in energy efficiency and zero direct emissions heating.

Taskforce Thinking

This recommendation aims to overcome currently competing impacts, whereby private investment by non-domestic building owners in energy efficiency and ZDEH measures can create a green rental premium by, on the one hand, helping tenants lower energy bills through using less energy than would otherwise be the case, whilst simultaneously increasing the rateable value of the property.

This can mean that energy cost savings are offset by rateable bill increases, and result in making the property less commercially attractive than alternatives that have not been retrofitted.

This is a practical recommendation related to a devolved tax power and which, if addressed, offers the potential to remove a barrier currently acting as a disincentive to retrofitting across the non-domestic sector. This recommendation is also aligned with a commitment in the Scottish Government's Heat in Buildings Strategy (2021) which agreed to consider how powers like non-domestic rates could be used to encourage the retrofit of buildings.

This recommendation will help address challenges discussed in section 4 of this report, specifically –

4.1.1 – Financing support context and influences; overarching macroeconomic drivers

4.2.6 – Finance demand constraints and challenges; legislative barriers

7. Recommendation

Scottish Government should commission research, by mid-2024, to help mitigate the split incentive issue by exploring options for the use of green rental agreements in Scotland, and then pilot deliverable approaches, by early 2025, to encourage retrofitting in privately rented properties.

Taskforce Thinking

This recommendation aims to help overcome the split incentive barrier, between landlords incurring the capital and financing costs of installing ZDEH technologies and energy efficiency measures, and tenants who receive the associated benefit, whether or not they are using energy more efficiently.

Green rental agreements and leases can apply across both domestic and non-domestic sectors, and guidance on good practice does exist. However, the application of such agreements or clauses has not been widely demonstrated. The Taskforce believes it would be beneficial to test such agreements in practice, building on the work of the Better Buildings Partnership and GFI on green leases and green rental agreements respectively, to build real life evidence and experience on where and how they can most effectively be utilised. Disseminating the outputs of any pilot initiatives would, in turn, help plan for a wider rollout of such agreements and clauses as standard in all leases over time.

This recommendation will help address challenges discussed in section 4 of this report, specifically –

- 4.1.1 – Financing support context and influences; overarching macroeconomic drivers
- 4.2.4 – Finance demand constraints and challenges; split incentives
- 4.2.6 – Finance demand constraints and challenges; legislative barriers

8. Recommendation

Scottish Government should immediately seek to engage with UK Government and regulators to ensure alignment of approaches and support coordination of activity between governments and regulatory bodies.

Taskforce Thinking

This recommendation aims to foster consistency and alignment of policies around energy efficiency and ZDEH across Scottish and UK Governments, particularly with regards to implications for financing the transition. Many larger companies, which will play an essential role in transitioning to zero emissions heating, operate across the UK, for example, energy or finance providers. Having a consistency of approach and policy goals will, therefore, make it easier for these companies to develop and deliver financial products and other services associated with improving energy efficiency and installing ZDEH systems.

Additionally, there is a range of potential levers currently reserved to the UK Government, including key aspects of fiscal policy and the treatment of VAT with regards retrofitting works. The Taskforce believes it would be beneficial for governments to work together, and with industry and consumers, to explore collectively how to most effectively stimulate demand for energy efficiency and ZDEH measures.

While engagement between the Scottish and UK Governments will be important in creating this consistent structure for the market, it will also be important to develop and maintain productive relations with UK regulators. This includes both OFGEM, the energy regulator, and the FCA, which regulates the provision of financial services. OFGEM has a critical role to play in helping reduce the differential in gas and electricity prices, so as to help improve the attractiveness of converting to electric heat systems, as well as a range of factors influencing the retail electricity market supply and demand balance. The FCA establishes the rules that finance providers must adhere to in areas like the proportion of asset books that must comprise green investments, or the level of capital that must be held against loan books. Changes in these regulatory parameters could have a big impact on incentivising private capital provision for retrofitting activities, and it would, therefore, make sense to explore these collaboratively.

This recommendation will help address challenges discussed in section 4 of this report, specifically –

4.1.1 – Financing support context and influences; overarching macroeconomic drivers

4.1.3 – Financing supply context and influences; green taxonomy

4.1.4 – Financing support context and influences; other influences from

9. Recommendation

Scottish Government should map, by mid-2024, the current availability of physical and investment-related data pertinent to heat in buildings – identify gaps and establish a framework promoting open data sharing to address these.

Taskforce Thinking

This recommendation aims to support the ongoing monitoring and evaluation of how Scotland’s buildings are progressing towards ZDEH targets. While there is a wealth of data available, and private finance providers will develop their own databases as they start testing products like green mortgages in the marketplace, this does not always provide a complete picture of the current situation. For example, robust data on the energy efficiency and heat use in the non-domestic sector can be difficult to track, as some businesses generate significant amounts of heat from processes undertaken, rather than to maintain temperatures in spaces, while others use a single fuel source for multiple purposes, making it difficult to identify the proportion used for heat.

Reliable and consistent data on the current state of the energy efficiency performance and level of ZDEH systems installed across different types of domestic and non-domestic properties is important for overall retrofitting policy, as well as enabling finance providers to effectively develop and target financial products at different customers. Markets function best where full information is available to all parties, as this enables customers to make better informed decisions, while providers can accurately reflect risks in deciding upon prices. For a nascent, yet growing, market such as finance for energy efficiency and ZDEH, the principle of open data will also be beneficial because it will help ensure that all parties can access all relevant information to inform their decisions⁴⁴. It will also be beneficial in terms of developing an improved evidence base to support policy implementation.

This recommendation will help address challenges discussed in section 4 of this report, specifically –

- 4.2.3 – Finance demand constraints and challenges; poor financial returns
- 4.2.7 – Finance demand constraints and challenges; quality of data

⁴⁴ [Open Data Strategy - gov.scot \(www.gov.scot\)](https://www.gov.scot/open-data-strategy)

7. NEXT STEPS

This Part 1 Taskforce Report aims to stimulate discussion around how best to develop the range of financing options that we see as being important in delivering the significant transformation of heating in buildings that will be necessary to achieve the Scottish Government's Net Zero targets. It offers analysis of the current situation and commentary on the measures which could help increase the demand for retrofitting, along with providing recommendations to support scaling of financial products to service the increase in demand for energy efficiency and ZDEH systems that will be required over the second half of the decade and beyond.

Our hope is that, by stimulating discussion around energy efficiency and ZDEH measures, and, in particular, how to scale the financing of these, this report can help raise understanding of the changes that will be necessary for all buildings over the next 20 years. We also hope it will help start to build an awareness of the role of different public and private organisations, as well as that of individuals.

This Taskforce will continue working towards publishing a Part 2 Report in 2024. The main focus of our Part 2 Report will be place-based mechanisms and larger scale financing options for energy efficiency and ZDEH systems. Our Part 2 Report will cover retrofitting finance options for social housing, area-based mechanisms, including district heating, neighbourhood financing mechanisms, the potential of municipal bonds, quasi equity-based funding, aggregation financing, as well as heat as a service models.

Our Part 2 Report will also explore the potential interactions between issues discussed in this report, for example, the potential for co-investment (blended finance) models to contribute to social housing retrofit programmes. In doing so, it will also reflect on all the conclusions emerging from the Taskforce's work, and we will offer our views on priorities and next steps arising from the recommendations we make, with a view to help focus early action where it has the greatest opportunity to generate a positive impact.

Finally, an important aim of this Taskforce is to continue our ongoing engagement with stakeholders in the market, as well as maintaining existing relationships across organisations and building new partnerships. These will all be important in creating the environment for products and services to be successfully piloted, scaled-up and delivered over the coming months and years.

The Taskforce recognises that others will have expertise and views on the issues covered in this report and we would welcome opportunities to explore these with you. Should you have any comments, questions or wish to discuss points covered in this report further, then please contact: greenheatfinancetaskforce@gov.scot

Any views received will provide the Taskforce with the opportunity to reflect further on these issues in advance of our Part 2 Report. This might include highlighting any tools that could help develop the products we have discussed, or examples of effective mechanisms being trialled, which we could consider in a Scottish context.

8. ANNEX 1 – Taskforce Membership

Scottish Council for Development and Industry (SCDI)
Sara Thiam, Chief Executive Prosper (Trading name of SCDI)
and Taskforce Co-chair

Prosper has a proud history of bringing government, business and civil society together to seize economic opportunities and make a difference to the challenges facing Scotland. With members from across Scottish society - from charities to local authorities and micro businesses to multi-nationals – The Council thinks bigger picture and longer-term. Prosper builds on and complements the activities of representative organisations (business, worker, trade, and professional) providing a unique space where they come together to unlock economic growth which works for Scotland’s people and our planet.

Sara is a former Director for the Institution of Civil Engineers (ICE) in Scotland and member of the Infrastructure Commission for Scotland. Her non-exec roles include Construction Scotland Innovation Centre (now BE-ST).

Sara’s career in economic development includes the Glasgow Edinburgh Collaboration Initiative and EU projects designed to stimulate Scottish innovation. Her early career involved the setting up of the Eurodesk youth information service subsequently replicated throughout the EU.

University of Edinburgh Business School (UEBS) Centre for Business, Climate Change and Sustainability (B-CASS)
Dr. Ian Cochran, Lecturer and Programme Director, Master of Science CCFI,
Director for Impact, B-CCAS

For almost 15 years the University of Edinburgh Business School has had a faculty dedicated to researching and teaching issues related to climate change and sustainability. It is home to one of the oldest dedicated MSc programmes around issues at the intersection of climate change, investment, finance and policy. The Business School also has an extensive offer of bespoke and open Executive Education programmes working with a range of financial, commercial and third-sector clients.

The UEBS Centre for Business, Climate Change, and Sustainability draws on over a decade’s experience engaging with large and small businesses, policy makers, non-governmental institutions, and others, providing leading research, advice, consultancy, executive education, and more. Members of the Centre for Business, Climate Change, and Sustainability work in five main areas: Accounting for Climate Change and Sustainability, Doing Business Sustainably, Financing a Sustainable World, Transforming to a Sustainable Society, and Transitioning to a Low Carbon Economy.

Independent

Rufus Grantham, Founding Partner at Living Places

Rufus is a sustainable finance specialist with a focus on scaling responses to climate change while delivering better life outcomes for people. He has spent two decades working in investment research advising asset management clients on their investment strategies. He is a co-founder of Living Places, a social enterprise and advisory company focused on driving social, environmental and economic benefits through the transition of places.

He is also currently a Director at Blood and Sand Ltd. and a General Partner at Mettle Capital Partners, a corporate ESG integration data company.

Independent

Kirsty Hamilton OBE

Kirsty has over three decades experience in efforts to tackle climate change and accelerate the energy transition. In 2004 she set up an initiative at the nexus of renewables, finance and policy with leading finance practitioners and ran the Low Carbon Finance Group during UK electricity market reforms. Recent research work (UKERC) examines investment confidence and transparency.

She is an Associate Fellow at Chatham House and was a philanthropy-funded advisor to the COP26 Energy Transition team. She has been an IPCC expert reviewer and contributing author and was awarded an OBE in new year 2021 for services to green energy, finance and climate change.

Green Finance Institute (GFI)

Emma Harvey-Smith, Built Environment Programme Director

Uniquely positioned at the nexus of the public and private sectors, the GFI is the UK and Europe's principal forum for innovation in green finance. GFI partners with financial institutions, corporates, policymakers, academics, philanthropists and civil society experts to develop solutions that will redeploy capital at the pace and scale that science demands. Backed by government, trusted by finance, and led by bankers, GFI uses its neutral platform to co-design financial instruments and mechanisms as well as develop the enabling frameworks, guidance and policy ideas needed to support greater green investment. Its credibility, capability and cross-sector engagement enable the GFI to respond to market barriers and develop solutions where others can't. GFI collaborates with and for the market to strengthen green finance in the UK, Europe and globally.

EIT Climate-KIC

Andy Kerr, Chief Strategy Officer

Climate-KIC is a knowledge and innovation community focused on supporting whole systems innovation through coordinated interventions on different levers of change, ranging from early stage business support, to regulatory innovation, with the aim of helping city-regions to deliver resilient and zero carbon goals.

Supported by the European Institute of Innovation and Technology, Climate-KIC identifies and supports innovation that helps society mitigate and adapt to climate change. It believes that a decarbonised, sustainable economy is not only necessary to prevent catastrophic climate change, but presents a wealth of opportunities for business and society.

Andy was previously the Executive Director of the Edinburgh Climate Change Institute and led the development of ECCE into the leading low carbon hub in Scotland.

Scottish National Investment Bank (SNIB)

Eddie McAvinchey, Executive Director Sustainable Investment

The Scottish National Investment Bank is a public development bank, established to provide patient, long-term investment capital to businesses and projects in Scotland. The Bank seeks to address opportunities which the private sector is not able to fully finance. It is complementary to private investment and has a particular focus on proving out commercial models and ‘crowding-in’ private investors.

The Bank acts as a commercial investor and is guided by its three strategic missions: to support a Just Transition to Net Zero, to build communities and promote equality of opportunity, and to foster innovation.

While publicly owned, the Bank operates independently and on a commercial basis, and can work collaboratively with partners in both the private and public sectors to develop and prove out new investment models.

Scottish Financial Enterprise (SFE)

Sandy MacDonald*, Director of Public Policy and Communications

Scottish Financial Enterprise is the representative body for Scotland’s financial and related professional services industry, with over 110 member companies, ranging in size from global organisations headquartered in Scotland, such as abrdn, Baillie Gifford, Bank of Scotland, and the Royal Bank of Scotland; to UK and international companies with substantial operations in Scotland, such as Barclays, BlackRock, JP Morgan, Morgan Stanley, Phoenix Group and Royal London; as well as Scottish-based fintechs, credit unions and support companies drawn from all areas of financial services, like FNZ and Origo.

*Sandy MacDonald represented SFE on the Taskforce until September 2023. For phase 2 of the Taskforce, SFE’s representative will be **Ben Rose**.

UK Green Building Council (UKGBC)

Simon McWhirter, Deputy Chief Executive and lead for UKGBC Scotland

Powered by over 700 member organisations from across the value chain, UKGBC is at the forefront of positively influencing policy, identifying the pathways required to propel the sector forward sustainably and driving the solutions to transform our buildings, communities, cities and infrastructure so that people and nature thrive.

Simon leads UKGBC's policy and political work, as well as overseeing its corporate communications with members, media and the wider industry. He also has oversight of UKGBC's portfolio of place-based projects and devolved activity.

Launched at COP26, when the world's eyes were turned to Glasgow, UKGBC Scotland works collectively across the sector to convene industry leaders and engage with devolved authorities to sustain momentum and drive through major initiatives to support the Scottish built environment's path to Net Zero.

Scottish Renewables

Helen Melone, Senior Policy Manager - Heat, Hydrogen & Solar

Scottish Renewables is the voice of Scotland's renewable energy industry. Its vision is for a Scotland leading the world in renewable energy, working to grow Scotland's renewable energy sector to keep it at the forefront of the global clean energy industry. Its members work across all renewable energy technologies, in Scotland, the UK, Europe and around the world. These members deliver investment, jobs, social benefits and reduce the carbon emissions which cause climate change.

Scottish Renewables, in representing its members, aims to lead and inform the debate on how the growth of renewable energy can help sustainably heat and power Scotland's homes and businesses.

As the trade association for all renewable energy technologies in Scotland, it has a strong focus on renewable heat and heat decarbonisation, as well as the opportunities these offer for the increased use of renewably-generated electricity. This can mean working towards city-scale heat networks in Scotland's cities and investigating and communicating the benefits of heat pumps, as well as exploring how heat decarbonisation can be financed.

Helen's work as the Senior Policy Manager for Heat, Hydrogen and Solar involves managing and supporting the development of Scottish Renewables' policy positions, which aim to create the conditions for the sustainable growth of Scotland's renewable energy industry, and communicating these effectively to key policy and regulatory decision makers.

Energy Consumer Committee

Lewis Shand Smith, Energy Consumer Committee Chair

The ECC is tasked with bringing the voice of the consumer to the development of energy policy and a just transition. Its membership consists of those who are working with and on behalf of energy consumers in Scotland. It provides a forum for the exchange of hard data, the outcome of research and the feedback of qualitative data – what people are thinking and feeling.

The network is supported by Consumer Scotland and is a strategic leadership group reporting to the Scottish Energy Advisory Board.

ANNEX 2 – Potential Finance Mechanisms

The following options were considered by the Taskforce and used to explore the merits of each financing method and their suitability for decarbonising Scotland’s buildings. Across the table of columns, there is a list of the broad sectors to which the financing mechanism may apply, and the strength of its relevance / suitability is provided using a scale of 0-3 (namely, 0 – unsuitable, 3 – very suitable). This reflects the appropriateness of the Scottish Government utilising the financing option to support funding of a particular sector. The table rows describe the merits of each option by providing an overview of the scheme, describing its advantages and limitations, as well as factors to consider in delivery and whether such financing has been employed elsewhere on other schemes.

- **Grants**

Grant funding provided by Scottish Government to support direct funding of Net Zero measures.

Government Grants (Demand Driven)					
Overview:	Grants are provided by Scottish Government to support the implementation of Net Zero measures.				
Applicable sectors	Corporates (Private)	Corporate (Public)	PRS	Social	Owner Occupier
	1 (SME)	2	1	3	3 (low income)
Scoring Approach	Sector applicability scores are based on the extent to which building owners could be categorised as ‘unable to pay’, have low income, or operate on a ‘not for profit’ basis and therefore require direct zero cost support.				
Advantages	<ul style="list-style-type: none"> ✓ There is no cost / limited cost to the individual or organisation. ✓ Can be used as an incentive to attract or ‘crowd-in’ external finance or de-risk private sector investment. ✓ Can ensure compliance and reporting, as well as adequate ‘standards’ are met for measures employed. ✓ Provides direct Scottish Government support to drive Net Zero. ✓ Use of repayable grants for large infrastructure projects (e.g. district heating) where they become successfully operational could allow recycling of grant money. 				
Limitations	<ul style="list-style-type: none"> ✗ Likely to require significant increase of current Scottish Government budget levels and therefore potentially unaffordable or sustainable. ✗ Grants provided unnecessarily to organisations that have alternative finance available and do not ‘need’ free finance. ✗ Cost to administer and prevent fraud and misuse. 				
Obstacles & deliverability	<ul style="list-style-type: none"> ➤ Need to establish eligibility criteria for grant applicants. ➤ May restrict use of other incentives such as government subsidies and may have pricing control implications (if supporting corporates). ➤ Need to establish level of available grant and what eligible works are covered. 				

Government Grants (Demand Driven)	
	<ul style="list-style-type: none"> ➤ Need to consider governance arrangements over grant scheme, e.g. overview through schemes such as LCITP, etc. ➤ Potentially significant expense of administering grant schemes.
Examples	❖ Various grant schemes already operate within Scottish Government relating to Net Zero measures e.g. HEEPs ABS and Warmer Homes Scotland.

- **Traditional Self-financing (including unsecured loans)**

In a global context, according to the World Energy Agency's 2014 Special Report on World Energy Investment⁴⁵, 60% of all energy efficiency / Net Zero works have been undertaken using self-finance. In the World Energy Agency's report, self-finance excludes loans, bonds and equity funding. In this context, the concept of self-finance includes existing readily available loan finance (e.g. mortgages and corporate debt) held by individuals / organisations, as well as capital budgets available to public sector organisations.

Within the broad groups considered by the GHFT, private housing (owner occupiers and the private rented sector) is likely to have access to self-finance. This is an important consideration when comparing these financing costs with existing Scottish Government provided schemes – the cost of self-financed options, compared with accessing any Scottish Government supported financing offer (e.g. HES loans) will influence the extent to which individuals / organisations use their own financial resources, and the extent to which private sector corporates (such as banks) will develop products. Government support should not crowd out self-financing of organisations / individuals, as this may result in delayed private investment in anticipation of free grants / low cost finance becoming available.

Traditional Self-financing (including unsecured lending)					
Overview:	Individual sectors / property owners source their own financing requirements for undertaking Net Zero measures – this may be through existing or new sources such as cash, loans and rental income.				
Applicable sectors	Corporates (Private)	Corporates (Public)	PRS	Social	Owner Occupier
	3 (loan/cash/h)	3 (PWLB/capital budget)	3 (loan/cash/rent)	3 (loan/cash/rent)	3 (loan/cash/h)
Scoring Approach	Most building owners (individuals or organisations) will have access to or can secure their own 'private' finance and so is a benefit to Scottish Government if building owners use this.				
Advantages	<ul style="list-style-type: none"> ✓ No impact on Scottish Government budgets. ✓ Provides freedom to individual property owner for selection of Net Zero measures, and Government support can be directed to 				

⁴⁵ [World Energy Investment Outlook](#)

Traditional Self-financing (including unsecured lending)	
	<p>other areas such as quality assurance, skills and training, building assessment, etc.</p> <p>✓ This may be the preferred approach for individuals and organisations, i.e. to utilise own resources rather than using externally available support.</p>
Limitations	<p>✗ Capacity / willingness of owners and organisations to take on more debt or use available cash.</p> <p>✗ Self-financing will not be possible for low income sector.</p> <p>✗ In absence of regulation or incentives, self-finance is likely to be put to an alternative use. Certain Scottish Government loan schemes, have experienced poor uptake.</p> <p>✗ Potential reputational risk to Scottish Government of providing only limited or no financial support.</p>
Obstacles & deliverability	<p>➤ Appetite for self-finance driven by payback period for Net Zero measures.</p> <p>➤ Acceptability of placing financing responsibility on end-users if linked to mandatory regulation.</p> <p>➤ Other measures required, e.g. incentives / regulation to drive demand for Net Zero implementation.</p>
Examples	<p>❖ Many examples across countries, e.g. Scotland, England and across Europe.</p>

- **Green Loans or mortgages (secured lending)**

Direct loans may be provided by the private or public sectors, and, if used in combination, can provide a mechanism where public funding may decrease the overall cost of Net Zero refurbishment loans. The impact and relative success of direct loans is likely to be influenced by the use of retail distribution networks or specialist banks (e.g. Ecology Building Society, Triodos) through which loans can be made. The Scottish Government may be able to provide loans directly (as it currently does through various schemes) or through partnerships with other organisations (e.g. banks) or funds.

Green Loans or mortgages (secured lending)					
Overview:	Scottish Government loans are provided to appropriate sector. 'Green' private sector loans exist in this area and an alternative Scottish Government role may be to facilitate, market and support expansion and growth of this private lending market.				
Applicable sectors	Corporates (Private)	Corporates (Public)	PRS	Social	Owner Occupier
	2	1	2	1	3
Scoring Approach	Both private (e.g. banks) and public sector bodies (e.g. Scottish Government or Local Authorities with permission to on-lend) can provide loans across all sectors. The scoring above reflects how applicable Scottish Government loans would be to the respective sectors. Low scores reflect that the sector borrowing through its own sources and not directly from Scottish Government.				

Green Loans or mortgages (secured lending)	
Advantages	<ul style="list-style-type: none"> ✓ Scottish Government lending could be used to support ‘crowding-in’ of private money leverage, and potentially deployed alongside a grant programme. Scottish Government loans could also reduce the overall cost of any finance. ✓ Easy to roll out, but careful pre-launch analysis of supply and demand and legal / tax framework needed. ✓ Easy to use a ‘standard’ and familiar product offering flexibility according to individual preferences (repayment, fixed interest rate, etc.). ✓ Loans provide an effective tool for residential Net Zero improvements in the £2,000 to £10,000 range that are too expensive for a cash / credit purchase, but do not warrant taking out a second mortgage. ✓ The use of Scottish Government finance for direct loans in housing allows discretionary interest rates to be applied, depending on creditworthiness of borrower, i.e. provide increasing support to those with poorer credit scores. ✓ Once loan book is established, potential to refinance Scottish Government debt to commercial banks. This ‘crowds-in’ private capital and could allow proceeds to be re-lent if required. ✓ Potential positive impact on use of public capital budgets if additional private sector borrowing can be ‘crowded-in’.
Limitations	<ul style="list-style-type: none"> ✗ Capacity / willingness of owners to incur more debt finance – but potentially offset by energy savings and enhanced market value of building on completing work. ✗ Potential regulatory issues to consider if lending is extensive. ✗ Risk aversion of banks (hence need for guarantees from Scottish Government) to lend to borrowers with poor credit. ✗ Leverage effect of public funds is usually less than 10x and grants are often required alongside to achieve Net Zero ambition⁴⁶.
Obstacles & deliverability	<ul style="list-style-type: none"> ➤ Transaction costs to implement and administer long-term programs with partnering institutions. ➤ Enhancement and establishment of robust governance processes for oversight of Scottish Government lending processes. ➤ Address potential subsidy control issues associated with low cost lending across sectors. ➤ Increased focus on financially optimal rather than long-term beneficial Net Zero standards.
Examples	<ul style="list-style-type: none"> ❖ Scottish Government Loan schemes, EST – HEEPS, SALIX, KfW, NRW. BANK, Kredex, EBRD Sustainable Finance Facilities (SEFF), amongst others.

⁴⁶ UNEP SEFI, Public Finance Mechanisms to mobilise investment in climate change mitigation, 2009

- **Equity Schemes**

A lifetime mortgage is a type of equity release scheme available in the United Kingdom. It is a way for homeowners, typically those over the age of 55, to release some of the equity tied up in their property, without having to sell it or move out. The term "lifetime" refers to the fact that the mortgage is typically repaid when the homeowner passes away or moves into long-term care, at which point the property is usually sold, and the proceeds go towards repaying the loan.

Equity Schemes					
Overview:	Equity loan schemes provide an alternative route for property owners in private housing to fund net zero improvements, particularly where Net Zero measures would be difficult to fund for lower income property owners.				
Applicable sectors (3 – 0 strong, weak)	Private sector (corporate) supported	Public sector supported	PRS	Social	Owner Occupier
	3	2	3	1	3
Scoring Approach	Scoring reflects the potential applicability to sectors where there is private housing and for the source of equity financing.				
Advantages	<ul style="list-style-type: none"> ✓ Average house price in Scotland is £194,000 (2021)⁴⁷. ✓ Value of equity within OO market is estimated to be in the region of £150 billion. Annual house price inflation has ranged from 3-6% and so the cost of Net Zero measures could be recovered by roughly 2-3 years of house price growth. ✓ Almost 50% of owner occupiers are mortgage free and could potentially look to equity release to raise financing. ✓ Support mechanism for homeowners who are asset rich but cash poor and does not affect their current income levels. 				
Limitations	<ul style="list-style-type: none"> ✗ Potentially costly and lengthy administration from a legal perspective for Home Reversion Plan equity products. ✗ Unlikely to be a financing option for owners with a high Loan to Value (LTV) on their property. ✗ A negative equity situation could lead to the borrower being unable to repay the loan. 				
Obstacles & deliverability	<ul style="list-style-type: none"> ➤ Debt outstanding for an indeterminate time period (although people can choose to repay earlier if they have funds available). ➤ Historically, equity release schemes have a poor track record within wider market and are likely to result in legacy impacts relating to the understanding of features and benefits of products. ➤ Determining how Scottish Government could best support development of this market. ➤ Ascertaining eligibility criteria for equity loan and provision of flexibility to repay loan and/or interest. 				
Examples	❖ Scottish Government equity loan scheme pilot.				

⁴⁷ [Property-Market-Report-2020-21-Infographic.pdf \(ros.gov.uk\)](#)

- **Property Linked Finance**

PLF can support homeowners to fund up to 100% of the upfront costs of energy efficiency improvements – with the unique characteristic that the finance is linked to the property, rather than the property owner, which results in payment obligations transferring to the new owner when a property is sold. An underpinning idea of PFL is that the person benefitting from the energy efficiency measures at a given moment in time is also responsible for the PLF payments.

Property Linked Finance					
Overview:	PLF can support homeowners to fund up to 100% of the upfront costs of energy efficiency improvements, with finance linked to the property, rather than the property owner, resulting in payment obligations transferring to new owner when a property is sold.				
Applicable sectors (3 – 0 strong, weak)	Private sector (corporate) supported	Public sector supported	PRS	Social	Owner Occupier
	3	0	3	1	3
Scoring Approach	Scoring reflects the potential applicability to sectors where there is private housing and for the source of Property Linked Financing (based on US data).				
Advantages	<ul style="list-style-type: none"> ✓ PLF can be designed to offer attractive interest rates and focus on local delivery with a reputable supply chain. ✓ UK households have increased accessibility to energy efficient and low carbon home improvements through a new funding method, where traditional financial solutions may not have been appropriate. ✓ PLF schemes can be capitalised by public funds and institutional investment, which allows the funding structure to evolve – towards more private sources – as the market scales. ✓ PLF cashflows are predictable and can therefore be securitised and distributed to the market, which can further support lower interest rates for end consumers and enable institutional investors to actively participate in upgrading the housing stock. ✓ The GFI has undertaken significant work to develop the PLF 'blueprint' to date, and is seeking a suitable banking partner to adapt its blueprint to align with the banking partner's business and operating model, as well as considering commercial considerations on the UK banking sector. 				
Limitations	<ul style="list-style-type: none"> ✗ Establishing PLF in the UK will require co-ordinated collaboration across the finance, legal, installer and property sectors, as well as local, devolved, and central governments. ✗ Establishing PLF may require new legislation, which could extend the timescales to bring PLF to market. 				
Obstacles & deliverability	➤ Legislative amendments may be required to allow payment obligations to transfer to subsequent homeowners in an efficient manner.				

Property Linked Finance	
	<ul style="list-style-type: none"> ➤ Determining how Scottish Government could best support development of this market. ➤ Financial regulations that ensure robust consumer protections and allow scope for financial innovation.
Examples	<ul style="list-style-type: none"> ❖ The PACE model in the United States that has supported over \$13 billion investment into energy efficiency and resiliency measures in domestic and commercial buildings. ❖ EuroPACE has developed a demonstrator with GNE Finance in Olot, Spain.

- **On-Bill Repayment**

On-Bill Repayment is a mechanism used to improve the creditworthiness (or seniority) of Net Zero investments by having them repaid in the utility bill, through the existing payment collection infrastructure of utilities or public authorities. Although not a direct form of financing (this is likely to be provided by the equipment supplier) it facilitates supplier investment, since it uses the existing payment relationship between the customer and utility supplier and directly provides a “credit history” giving an accurate view of likely defaults – customer payment histories with utilities are long and exhibit low default rates compared to other forms of consumer finance such as loans.

On-Bill Repayment					
Overview:	Obligations are provided on utility companies for the collection and payment of ‘savings’ to the provider of the Net Zero investment. On-bill repayment reduces the risk of repayments not being made and therefore raises attractiveness for investment.				
Applicable sectors	Corporates (Private)	Corporates (Public)	PRS	Social	Owner Occupier
	1	1	3	3	3
Scoring Approach	This option does not provide direct finance from Scottish Government, but typically from a supplier of Net Zero works or third party financier such as the Green Deal Finance Company. As such, the scoring reflects the difficulty of Scottish Government being able to support direct financing of investment.				
Advantages	<ul style="list-style-type: none"> ✓ Energy savings connected to energy bills. ✓ A similar mechanism could be developed with collection linked to council taxes. ✓ Reduced administration costs as systems already in place. ✓ Overcomes split incentives as measures are connected to the property and not occupant. ✓ Can overcome the lack of finance capacity of low income householders. 				
Limitations	<ul style="list-style-type: none"> ✗ Can be a complex scheme to manage / market / implement. ✗ Can be perceived as complex by users. ✗ Restricted to gas and electricity utilities. 				

On-Bill Repayment	
	<ul style="list-style-type: none"> ✗ Only savings from Net Zero measures are used to repay the investment, resulting on focus of short payback measures and inhibits deep retrofit measures.
Obstacles & deliverability	<ul style="list-style-type: none"> ➤ Modification needed to utility collection processing systems. ➤ Potential legal considerations need to be considered with utility companies. ➤ Scheme can easily become overly complex. ➤ Following the impact of the Green Deal, market sentiment appears not to favour this approach compared to others.
Examples	<ul style="list-style-type: none"> ❖ Green Deal in UK. ❖ Widely used in the United States (New York, Pennsylvania, Connecticut, Vermont).

- **Heat as a Service**

An Energy Services Agreement (ESA) more commonly called Heat as a Service (HaaS) is a "pay-for-performance" service contract between a third-party investor and a building owner to deliver energy savings as a service to the building. The ESA is an evolution of the traditional shared-savings model, provided through Energy Performance Contract (EPC) described above. A 3rd party investor and a building owner enter a HaaS contract (for a fixed period of time) where the building owner pays the 3rd party investor for delivery of a level of heat that meets certain comfort levels. That 3rd party invests into money-saving, energy efficient opportunities, and owns and operates that equipment, making a return on its investment.

Heat as a Service					
Overview:	Private sector supplier provides finance investment and installs Net Zero measures, and receives income from property occupant.				
Applicable sectors	Corporates (Private)	Corporates (Public)	PRS	Social	Owner Occupier
	2	1	1	3	1
Scoring Approach	The scoring reflects how easy it may be to get the scale of subscribers needed for a HaaS scheme to be established.				
Advantages	<ul style="list-style-type: none"> ✓ Direct contract between supplier and customer that gives customer specified levels of heating. ✓ May overcome some traditional barriers (e.g. split incentives) as enhanced savings may be shared between the building owner and investor. ✓ No capex for building owner required. Aligns incentives of project developer, building owner and investor through savings being shared amongst all parties. 				
Limitations	<ul style="list-style-type: none"> ✗ Limited scale to date. ✗ Fragmented market. ✗ Up to 10-year contract period say, may limit 3rd party measures installed to 'easy' Net Zero measures (high returns). ✗ Increased transaction costs may arise through detailed monitoring and validation of savings. ✗ Requires more developed skills on the client side. ✗ Lack of standardised framework and templates. 				

Heat as a Service	
Obstacles & deliverability	<ul style="list-style-type: none"> ➤ Education of building owners and project developers. ➤ Need for more pilots to help develop the market. ➤ Need to consider accounting and budgetary issues for public sector projects.
Examples	<ul style="list-style-type: none"> ❖ UK example of Sustainable Development Capital LLP. ❖ US providers such as Transcend Equity, Metrus Energy, Green City Finance, Abundant Power.

- **Dedicated Property and Investment Funds**

Property and infrastructure funds already provide a large amount of ‘invisible’ energy efficiency investment in the building sector. This investment takes place during a fund’s investment life cycle, with new developments, refurbishments, planned and preventive maintenance and active building management. Property investment may scale up finance in Net Zero in buildings, both through increased equity investments in the funds and through increased fund activity in Net Zero, where it can be facilitated by strong regulatory and market frameworks. Again, this does not represent direct investment by Scottish Government, but may facilitate investment through standards and regulation being applied to buildings.

Dedicated Property and Investment Funds					
Overview:	Private sector and Institutional Investor funding and Property Equity Funds investing in companies in the commercial and residential property sector.				
Applicable sectors	Corporates (Private)	Corporates (Public)	PRS	Social	Owner Occupier
	3	3	2	1	1
Scoring Approach	This is not a form of direct finance from Scottish Government. Scoring reflects Scottish Government’s influence on financing being essentially through regulation.				
Advantages	<ul style="list-style-type: none"> ✓ Many property funds exist across the EU. ✓ Funds are able to attract in private sector debt. ✓ As buildings are renovated, standards ensure efficiency measures are implemented. ✓ Sustainability and environmental criteria can be embedded as part of companies’ due diligence and valuation process. ✓ Fund managers can influence companies’ environmental policies in relation to Net Zero. ✓ Aggregating Net Zero gains from buildings to portfolio level. 				
Limitations	<ul style="list-style-type: none"> ✗ Difficult to estimate proportion of funds invested in energy efficient buildings. ✗ Limited to cost effective investment within the investment timeframe of each fund. ✗ In absence of specific regulatory requirements, achievements will occur, but could be limited to best practice within the industry, or to focus on the low-hanging fruit, namely, high return and quick payback. 				

Dedicated Property and Investment Funds	
Obstacles & deliverability	<ul style="list-style-type: none"> ➤ Regulation and/or incentives needed to drive investment in energy efficient retrofit. ➤ Scottish Government has lack of control of driving forward required measures and the timing of these.
Examples	<ul style="list-style-type: none"> ❖ Numerous: listed and unlisted property investment fund. ❖ Property companies. ❖ Infrastructure funds.

- **Energy Performance Contracting**

An Energy Performance Contract (EPC) is a contractual arrangement between a home/building owner and the provider of Net Zero improvements that are measured, verified and monitored during the whole term of the contract, where investments (works, supply, or service) for that measure are paid for in relation to a verified level of Net Zero improvement, such as financial savings, carbon savings, operating environment etc. Such contracts typically involve an energy service company (ESCo) which is responsible for investment and the delivery of guaranteed savings to the client.

Energy Performance Contracting					
Overview:	This form of financing is attractive to private sector supply chain companies which can provide installation, financing, and operational expertise.				
Applicable sectors	Corporates (Private)	Corporates (Public)	PRS	Social	Owner Occupier
	3	3	2	3	? (multi-household)
Scoring Approach	EPC contracts tend to be applied to non-domestic buildings, attracting interest from contracting specialists in various Net Zero work. It is less commonly seen in the domestic market, and Scottish Government support would require further thinking.				
Advantages	<ul style="list-style-type: none"> ✓ A contract defines the work to be undertaken and guaranteed savings to be achieved. ✓ EPC provider manages the performance risks. ✓ Contract performance driven by EPC provider professionalism and expertise. ✓ ESCo may attract own source of financing. 				
Limitations	<ul style="list-style-type: none"> ✗ Traditionally focussed on low hanging fruits rather than longer term beneficial measures. ✗ Transaction costs may be significant. ✗ Requires well developed skills and support on the client side. ✗ Standardised framework and templates may not apply or be appropriate for all clients. 				
Obstacles & deliverability	<ul style="list-style-type: none"> ➤ Accounting and budgetary treatment needs consideration (on / off balance sheet) for public sector bodies. ➤ Market is new and growing in Scotland and so confidence as well as understanding of EPC concept needs to be promoted. 				

Energy Performance Contracting	
	<ul style="list-style-type: none"> ➤ Potential misalignment of incentives in the rental sector, e.g. energy saving benefits offset by increased rental rates. ➤ Extent to which deep retrofit versus shallow retrofit is appealing to EPC contractors unclear. Where deep retrofit is desired / preferable, can additional investment be obtained from owner or grants? ➤ Deep retrofit normally timed with general refurbishment measures which increases the overall cost. Consideration needs to be given to the additional cost and potential support level for conditions improvements.
Examples	<ul style="list-style-type: none"> ❖ Scotland framework contract for corporates' measures in public sector buildings. ❖ London's RE:FIT programme, Bart's Health Care Trust, Peterborough Council. ❖ Rhone-Alps OSER for deep retrofits of public buildings and Croatian ESCo HEP.

- **Green Bonds**

Green Bonds are financial instruments where the issuer requires that cash proceeds from a bond issue are applied (either by ring-fencing, direct project exposure, or securitisation) towards climate and/or environmental sustainability purposes. Given the long-term, stable characteristics for real estate assets, debt financing has historically been the traditional approach for buildings, but the relatively new market for green bonds could be a natural place for Scottish Government or local authorities to seek capital for Net Zero investments in 'green' buildings, particularly where bond returns (via energy savings) are index-linked.

Green Bonds					
Overview:	Bond issues by public sector (Scottish Government or local authority), private sector or institutional investors, e.g. through a fund. Proceeds from bond issue used to finance capital works and project income (e.g. through tariffs / fees) subsequently used to repay the interest ('coupon') on the bond.				
Applicable sectors (3 – 0 strong, weak)	Private sector (corporate) supported	Public sector supported	PRS	Social	Owner Occupier
	2	3	1	2	0 (perhaps refinance?)
Scoring Approach	Scoring reflects that bond issues need to be large in value, and any proceeds need to be invested quickly (and hence reliant on demand) so that savings can be made and used to repay bond interest.				
Advantages	<ul style="list-style-type: none"> ✓ Large and deep pools of finance from investors exist for bonds. ✓ Bonds are a commonly used investment within the building sector where there are standard contracts, transactions and a known risk profile. 				

Green Bonds	
	<ul style="list-style-type: none"> ✓ Can provide a simple, single source of direct financing. ✓ Could have a low impact on Scottish Government or local authority budgets. ✓ They are a known and well understood form of investment.
Limitations	<ul style="list-style-type: none"> ✗ Needs large size to raise finance (e.g. £50+ million). ✗ Not widely used in the Net Zero sector at the moment. ✗ The bond and associated interest costs do not provide flexibility for repayment. ✗ Should deliver adequate returns to investors, aligned with the investment risk of associated Net Zero measures. Returns may not be comparable to other similar financial instruments. ✗ If the bond was issued by Scottish Government or a local authority, it could have significant affordability and borrowing implications.
Obstacles & deliverability	<ul style="list-style-type: none"> ➤ A strong pipeline of deliverable projects needed to avoid carrying the cost of interest on unutilised bond proceeds.
Examples	<ul style="list-style-type: none"> ❖ Aberdeen City Council Bond (although not a green bond). ❖ Unibail Rodamco green building bond. ❖ Climate Bond Initiative. ❖ Various Development Bank issuers (World Bank, IFC, etc.) for general green bonds.

- **Revolving loan fund**

As an extension of direct loans, revolving loan funds (RLFs) are pools of capital from which loans can be made for clean energy projects. As project loans are repaid, the capital is then re-lent to new projects. If defaults remain low, RLFs can be "evergreen" sources of capital that are recycled repeatedly to fund projects well into the future. Scottish Government, local authorities and private sector institutions could all establish RLFs to support energy upgrades potentially as joint ventures with the private sector.

Revolving Loan Fund					
Overview:	Public sector financing to create RLF. Potential to attract private money leverage and could be deployed alongside a grant programme.				
Applicable sectors	Corporates (Private)	Corporates (Public)	PRS	Social	Owner Occupier
	3 (SME)	3	3	3	3
Scoring Approach	The scoring above reflects how applicable revolving loans would be to the respective sectors. Low scores reflect that the sector is likely to borrow through its own sources and not use a Scottish Government revolving fund.				
Advantages	<ul style="list-style-type: none"> ✓ Potential to provide low cost finance, with an evergreen revolving source of funds that will be available in the long-term. ✓ Can shape eligibility requirements to fit many markets and program goals. ✓ Can have minimal or no interest. 				

Revolving Loan Fund	
	<ul style="list-style-type: none"> ✓ A government-sponsored RLF could offer lower interest rates and/or more flexible terms than are available in commercial lending markets, subject pricing controls. ✓ A RLF is an effective tool for residential Net Zero improvements in the £2,000 to £10,000 range that are too expensive for a cash/credit purchase but do not warrant taking out a second mortgage or equity investment. ✓ Leveraging in private sector capital into the fund can substantially increase the capacity of Scottish Government support.
Limitations	<ul style="list-style-type: none"> ✗ Scottish Government acting as administrator requires staff time and expertise to set up an RLF of scale, although good knowledge and experience exists from current schemes. Procurement required for any outsourced arrangements. ✗ Requires capital upfront to start the fund. ✗ An annual budget may be required from Scottish Government to cover the cost of any potential loan defaults. ✗ Often slow to revolve, especially with longer loan terms (likely for deep retrofit measures). ✗ Must conduct rigorous credit analysis on borrowers' ability to pay (or risk a high default rate). ✗ Costly collateral or security may be required from borrowers. ✗ Regulatory implications.
Obstacles & deliverability	<ul style="list-style-type: none"> ➤ Administration of the fund required to include application review, disbursement, collection, reporting and arrears management. Needs appropriate governance framework and processes to be established. ➤ Regulatory requirements would need to be considered in further detail. ➤ Criteria for establishing amount of loan, its length, applicable interest rate, etc. need consideration. ➤ Consider budgetary, pricing control and classification implications for use of a RLF. ➤ Controls over review and quality / nature / standard of works undertaken.
Examples	<ul style="list-style-type: none"> ❖ Several Scottish Government Net Zero related schemes exist e.g. HEEPs, Warm Homes, DHLF, etc.

- **Fiscal mechanisms**

Although not a direct form of financing, fiscal incentives / charges implemented by Scottish Government could be a useful tool to encourage private investment in Net Zero measures by providing monetary benefits to homeowners and organisations, encouraging and motivating adoption and uptake of Net Zero works, which otherwise would not take place. Likewise, penalties could also be charged and levied on those who do not wish to undertake the measures. Such fiscal measures could be developed either/or at a national, or local authority level, and could be combined. The receipt of penalty payments could be used to subsidise some of the costs of

funding a programme. Some examples, and by no means exhaustive, might include the following –

Scottish Government

Land and Buildings Transaction Tax (LBTT) – differential levels of stamp duty could apply, depending on the energy rating of the building / property sold and triggered at the point of sale.

Taxation – this could be in a similar form to existing Net Zero taxes such as ECO or modified versions applied within the scope of Scotland’s devolved powers.

Consideration and potential use of other devolved and reserved powers could also be explored.

Local Authorities (LAs)

Council tax levels – discounts and premiums could be applied to building rates (domestic and non-domestic) depending on their Net Zero performance. Premiums could be used to support private investment and fund works for a systematic programme of Net Zero measures (e.g. building by building) across a local authority area.

Public Works Loan Board (PWLB) - LAs could use their own financial resources to fund an Net Zero programme and recover costs directly from building and homeowners. It should be noted that LAs need Ministerial permission to on-lend. LAs can use powers such as “Missing shares” that allow them to pay a share of common repair or maintenance costs on behalf of a home owner in a tenement who is unable or unwilling to pay. The powers allow LAs to recover their costs by creating a charge against property.

Incentives charging					
Overview:	Incentives and/or penalties are applied to occupiers of buildings to encourage and motivate undertaking Net Zero works. The recipient of penalties can use the income to fund Net Zero measures.				
Applicable sectors	Corporates (Private)	Corporates (Public)	PRS	Social	Owner Occupier
	3	3	3	3	3
Scoring Approach	This is not a form of direct finance from Scottish Government, but can be used to encourage investment. Scoring reflects Scottish Government’s influence on being able to apply incentives / penalties for the sector.				
Advantages	<ul style="list-style-type: none"> ✓ Financing and/or funding is provided by the recipient, either through upfront capital spend (and rewarded via the incentive) or as an ongoing penalty. ✓ An overall scheme can be managed to be cost neutral, such that capital works (e.g. undertaken by a LA) are matched by ring fenced penalty income. 				

Incentives charging	
	<ul style="list-style-type: none"> ✓ It raises revenue that can be used to subsidise alternatives such as green electricity or support the development of favoured green technologies. ✓ Leads to a socially efficient outcome as it makes people pay the social cost and overcomes the excess consumption.
Limitations	<ul style="list-style-type: none"> ✗ Administration required for the collection of taxes, and re-allocation for payment of Net Zero measures may be expensive and inefficient. ✗ Enforcement of penalties may prove difficult. ✗ Consumers dislike new taxes and often do not believe that they will be 'revenue neutral'. Although not an economic argument, politically, measures may prove difficult to implement. ✗ Penalties may not support alleviation of fuel poverty.
Obstacles & deliverability	<ul style="list-style-type: none"> ➤ The scope of devolved powers may limit the extent to which incentives / taxation / penalties may be applied. ➤ Difficult to know the level of external cost and how much the tax should be. ➤ Possibility of tax evasion. Higher taxes may encourage firms to hide carbon emissions.
Examples	❖ UK ECO scheme, RHI income, FITs

• **Guarantees and first loss capital**

Scottish Government could provide risk-sharing facilities, either by way of guarantees or first loss facilities (capital) to lenders (such as banks or mortgage lenders) that reduce risk by covering part of the risk of payment default by institutions' borrowers – either through a call on a supporting guarantee or write-off of Scottish Government capital invested as a 'first loss', e.g. as part of a joint fund. This option could help de-risk initial third party institutional investment in this new market.

Guarantees and First Loss Capital					
Overview:	Public sector support through use of guarantees or first loss capital (e.g. into a Joint Venture fund) to a private sector finance provider that encourages 'crowding-in' of new capital.				
Applicable sectors	Corporates (Private)	Corporates (Public)	PRS	Social	Owner Occupier
	3 (SME)	1	3	3	3
Scoring Approach	Scoring is based on ability of risk sharing facilities ability to 'crowd-in' external private sector finance. This is likely to be more beneficial in private owned building sectors.				
Advantages	<ul style="list-style-type: none"> ✓ Reduces the risk for banks/mortgage lenders and enables them to lend greater amounts and potentially with lower margins. ✓ There is evidence to suggest that energy efficiency loans have a better credit performance than traditional loans (since cash savings can be used to repay finance). This is a relatively new market and Scottish Government 'risk sharing' support may help to make Net Zero loans more mainstream and 'vanilla' in nature. ✓ Can create leverage or 'crowd-in' private sector capital. 				

Guarantees and First Loss Capital	
	<ul style="list-style-type: none"> ✓ May support private sector lending to borrowers with poor credit.
Limitations	<ul style="list-style-type: none"> ✗ Takes time to structure and negotiate terms of guarantee with financial institutions. ✗ Need to ensure that excessive risk transfer away from bank/mortgage lenders does not occur, to ensure that banks retain appropriate credit management levels. ✗ Knowledge, skill and experience required to ensure any scheme is set up to be efficient and effective.
Obstacles & deliverability	<ul style="list-style-type: none"> ➤ Scottish Government support could be provided at an aggregated level (e.g. to a large fund) or applied through individual loans. The cost effectiveness of Scottish Government's support would need to be assessed. ➤ Potentially complex and extensive handling and administration of risk shared facilities. ➤ Robust governance and oversight of any guarantee scheme required to monitor and ensure exposures managed effectively.
Examples	<ul style="list-style-type: none"> ❖ IFC's CEEF programme (Hungary, Czech Republic, Estonia, Latvia, Lithuania, and Slovakia). ❖ France's proposal to create a national guarantee fund for renovation loans (via article 7 of EED). ❖ European Energy Efficiency Fund (EEEF).

9. ANNEX 3: Market Structure Overview

9.1 Domestic Buildings

There are over 2.5 million domestic properties in Scotland⁴⁸ and while they comprise a range of different buildings, their ownership can be classified as social housing, owner occupied or privately rented. Figure 9-1 below sets out the number of buildings falling into each ownership category, as well as the energy efficiency rating for each ownership type.

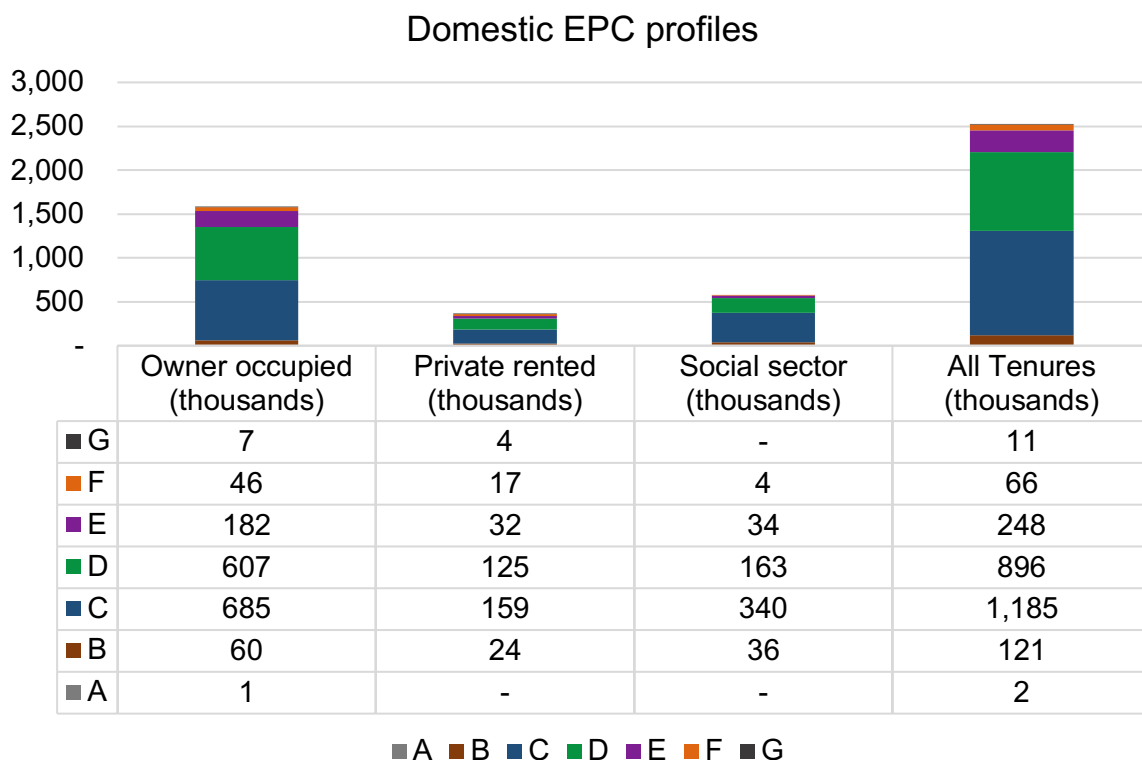


Figure 9-1 Current EPC profiles by housing sector

The figures show that owner occupied housing accounts for around 66% of all domestic buildings in Scotland, approximately 50% of which have an energy efficiency rating of C or better. While accounting for under approximately 12% of total domestic building stock, privately rented buildings echo the proportionate splits in energy efficiency shown by owner occupied buildings. However, there are likely to be differences in approaches required to encourage these two sectors to invest in ZDEH and energy efficiency as the barriers for the private rented sector are not all the same as for owner occupiers (see section 4.2.4 for discussion around split incentives).

In contrast, social housing, which accounts for around a 25% of total domestic buildings, has around 65% of its stock rated C or better for energy efficiency and only 6% which is E or lower.

⁴⁸ Scottish Housing Condition Survey 2021.

Fuel types across domestic stock

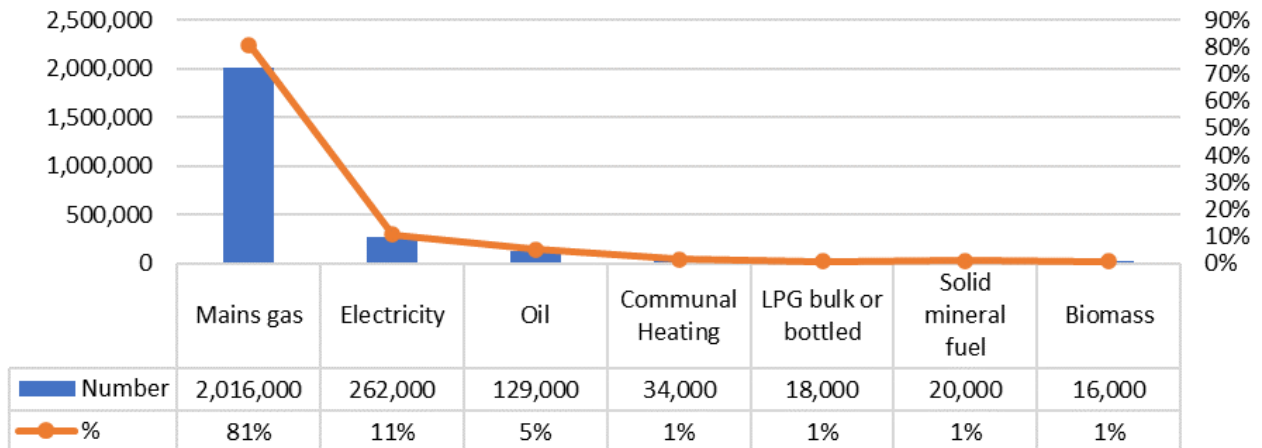


Figure 9-2 Current profile of energy fuel type for domestic properties

Figure 9-2 highlights the fact that 81% of homes are on mains gas, with electricity being a distant second as a primary source of heating, accounting for 11% of properties. The remaining fuel types make up the final 9% with oil being the most prevalent at 6% (mostly in rural settings where there is no mains gas available). There is therefore a compelling case for focusing on properties connected to the gas network, as converting these properties to ZDEH will have the biggest impact on overall targets. We recognise the actual technical solution and the financing needs will vary across gas connected properties.

Table 9-1 below shows indicative costs using government-derived data to make domestic buildings energy efficient and install ZDEH, broken down by different ownership types. These are aggregated averages across different types of property ownership and the individual costs will vary based on a range of factors, such as property age and type. Social housing is estimated to require 22% of the total cost for decarbonising heat in domestic buildings, slightly below its 25% share of building stock, although only 15% of the total cost involved with making domestic buildings energy efficient. This indicates that the efforts to and financing of decarbonising buildings, so as to contribute to achieving Net Zero targets, needs to be focused on owner occupiers, which account for both the largest number of buildings and a disproportionately higher level of costs required to decarbonise.

	Decarbonisation costs		Energy Efficiency costs			
	Total cost (£m)	Mains gas (£m)	Off gas (£m)	Mains gas (£m) ²	Off gas (£m)	Low Carbon fuels (£m)
Owner Occupier	17,673	12,702	1,554	2,690	493	234
Private rented	3,550	2,238	340	679	139	154
Social Housing	5,886	5,082	77	600	8	119
Total	27,109	20,022	1,971	3,969	640	507

Table 9-1 Overview of domestic property decarbonisation costs by tenure

Understanding the type of building, along with its age and geographical locations (urban versus rural, etc.) will have an impact on the types of retrofitting measures that will be most suitable for decarbonising an individual property's heat source. It will also have implications for the most appropriate type of financing.

Figure 9-3 below demonstrates that tenements are the most common type of domestic property in Scotland, followed closely by detached houses, which have accounted for the largest proportion of domestic construction since 1982. While relatively few of these two types of building were constructed during the mid-twentieth century, the retrofitting requirements of this stock are likely to vary substantially, as between a quarter and a fifth of both tenements and detached buildings were constructed before 1919. With the costs for retrofitting older buildings anticipated to be higher, and in some cases impacted by planning restrictions on the types of work permitted, the Taskforce anticipates a need for financing products that offer longer payback periods to ensure they are affordable for property owners where the costs of retrofitting are higher.

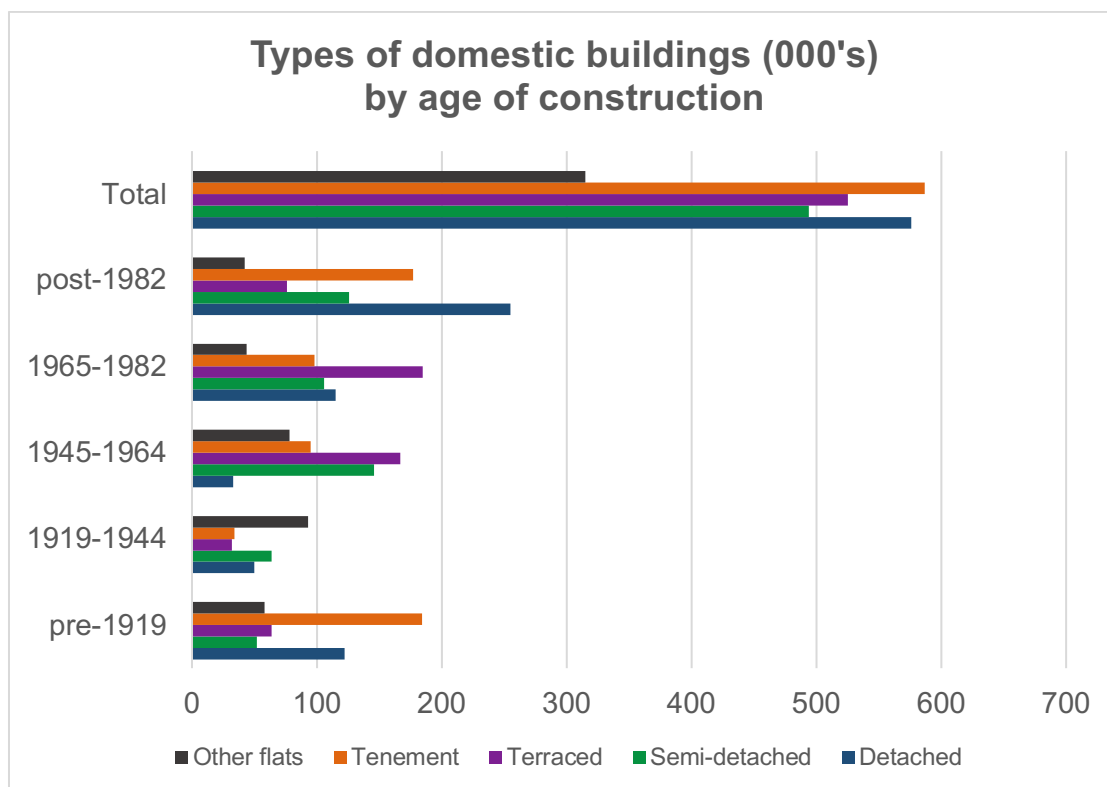


Figure 9-3 Age of domestic buildings by type

It will also be helpful to consider the annual turnover of housing stock in the development and financing of retrofit, as the point at which ownership of a property changes can be a key time at which heating (and other building) upgrades can be undertaken. Figure 9-4 below shows that out of the near 100,000 property sales in Scotland per year, about a third are flats, whilst almost three fifths are houses of different types⁴⁹.

⁴⁹ <https://www.ros.gov.uk/data-and-statistics/property-market-report-2022-23>

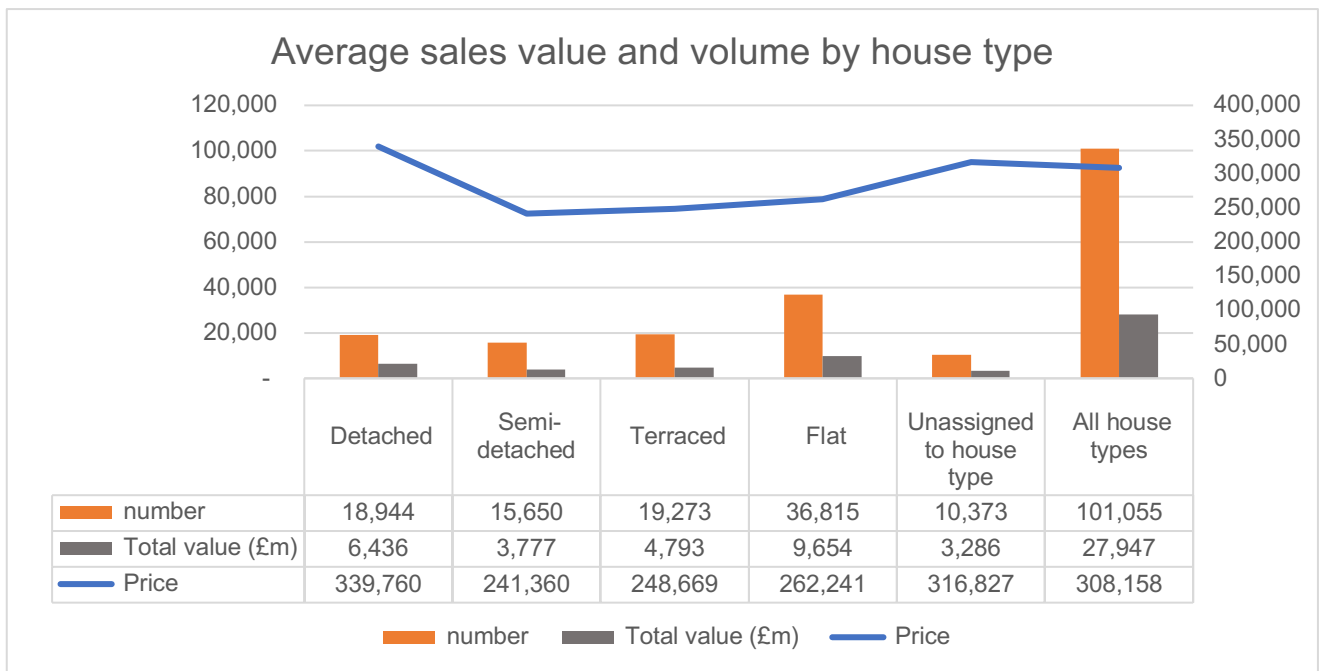


Figure 9-4 Profile of house sales by property type

If annual turnover of housing stock remains broadly in line with the levels in 2021, this means that between now (2023) and 2030, around three quarters of a million properties could be expected to change ownership. While this is equivalent to about 30% of Scotland’s current domestic housing stock, it would not, on its own, deliver the scale of transformation required to achieve targeted levels of Net Zero heating by the end of the decade, particularly as certain properties are likely to be sold multiple times over that period.

Accordingly, this supports the need for mechanisms that incentivise and encourage retrofit at other points in the ownership cycle of a property, for instance, on change of energy supplier. The Scottish Government should reflect on what these trigger points may be and how to best incentivise action at each point. This is likely to include broader area-based delivery mechanisms that can support decarbonising Scotland’s buildings in a way that does not rely on property sales as a natural trigger point for undertaking decarbonisation works. The use of LHEES and associated delivery plans will provide a valuable contribution to area-based delivery and is something we will discuss further in our Part 2 Report.

9.2 Non-domestic buildings

There are nearly 230,000 non-domestic buildings in Scotland of varying size and use. Over half (59%) of these buildings have electricity as their main heating fuel, compared to only 11% in domestic properties where 80% are heated by gas. Although a higher proportion of non-domestic buildings have electric heating, poor energy efficiency needs to be addressed to avoid massive peak demand on the grid and enable renewable supply to service a larger number of buildings.

Table 9-2, Table 9-3, and Figure 9-5⁵⁰ below show that retail and financial, offices and workshops and public assembly buildings are the most populous non-domestic building type. It is worth noting that while these three usage types account for nearly 70% of non-domestic buildings by premises, they make up a substantially lower total by building floor area at just under 60%.

Non-Domestic property type	Percentage of total non-domestic properties
Retail and Financial	32%
Offices and Workshops	27%
Public Assembly	11%
Restaurants, Cafés and Takeaways	8%
Industrial	6%
Hotels	4%
Education	4%
Storage and Distribution	4%
Healthcare	3%
Other	1%

Table 9-2 Share of non-domestic premises count

Non-Domestic property type	Percentage of total non-domestic area
Offices and Workshops	29%
Retail and Financial	18%
Public Assembly	12%
Industrial	10%
Education	9%
Hotels	8%
Storage and Distribution	7%
Restaurants, Cafés and Takeaways	5%
Healthcare	2%
Other	2%

Table 9-3 Share of total non-domestic area

⁵⁰ <https://www.gov.scot/publications/scotlands-non-domestic-energy-efficiency-baseline/documents/>

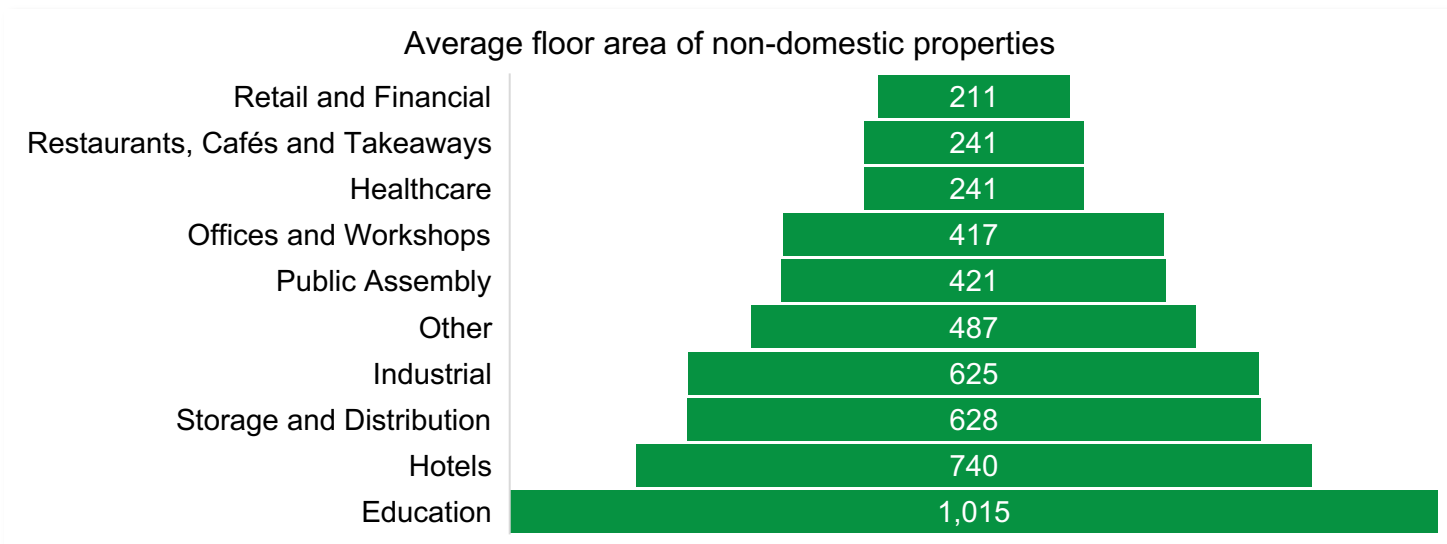


Figure 9-5 Average floor area by business type (derived from data in above figures)

The difference in the proportion of non-domestic buildings by premises, compared to floor area, may have implications for the targeting of initiatives at non-domestic building owners. The impact of each individual building owner amongst the top three categories (where floor areas of premises are smaller) converting to ZDEH on the overall heating emissions of non-domestic buildings will be less significant than when the owner of a hotel, industrial unit or educational property transitions. This is because these three categories of building account for relatively large proportions of the overall non-domestic building footprint and have relatively large individual property sizes on average. It is noted, though, that averages can be misleading, for example, in healthcare, where both hospitals (with a large footprint) and GP surgeries (with a much smaller footprint) are represented.

Non-Domestic EPC Profile By Sector

Figures 9-6 and 9-7 below illustrate that around 85% of non-domestic buildings have an EPC rating of D or lower⁵¹. This trend is relatively uniform across building types. While the EPC rating of non-domestic properties is generally much lower than domestic properties, some building types are particularly poor, for example, restaurants, cafés, takeaways and hotels. However, it is noted that available EPC data only covers less than 20% of non-domestic buildings and so the Taskforce recognises this trend may not be totally representative of the wider non-domestic stock.

These are also businesses which have been particularly hard hit through COVID-19 and the cost crisis, with margins being squeezed as they struggle to get demand to return to pre-pandemic levels, while simultaneously dealing with higher input and wage costs. The Scottish Government will need to take these pressures into account in designing policies and financing mechanisms that will enable these businesses to

⁵¹ [Supporting documents - Scotland's non-domestic energy efficiency baseline: report \(Scottish Government publication\)](#)

make a transition to ZDEH and improved energy efficiency at a time when many continue to face significant cash flow challenges.

Many of these businesses will also be tenants, so questions around whether it should be the owner or tenant that invests in property improvements, and how this is captured in leasing agreements, will be particularly important for these types of non-domestic buildings. (See section 4.2.4 for further discussion of this split incentives barrier).

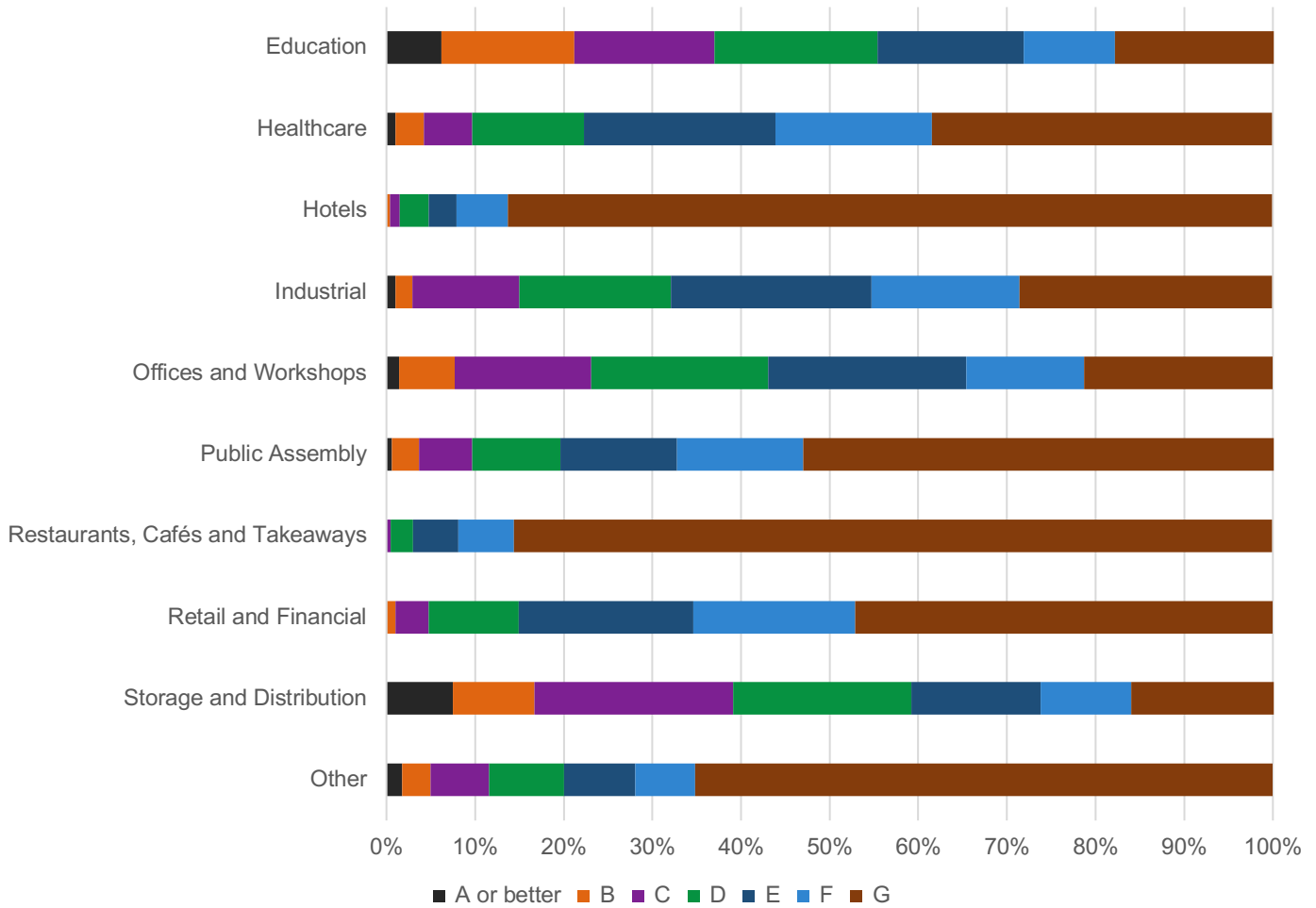


Figure 9-6 EPC profile by business type

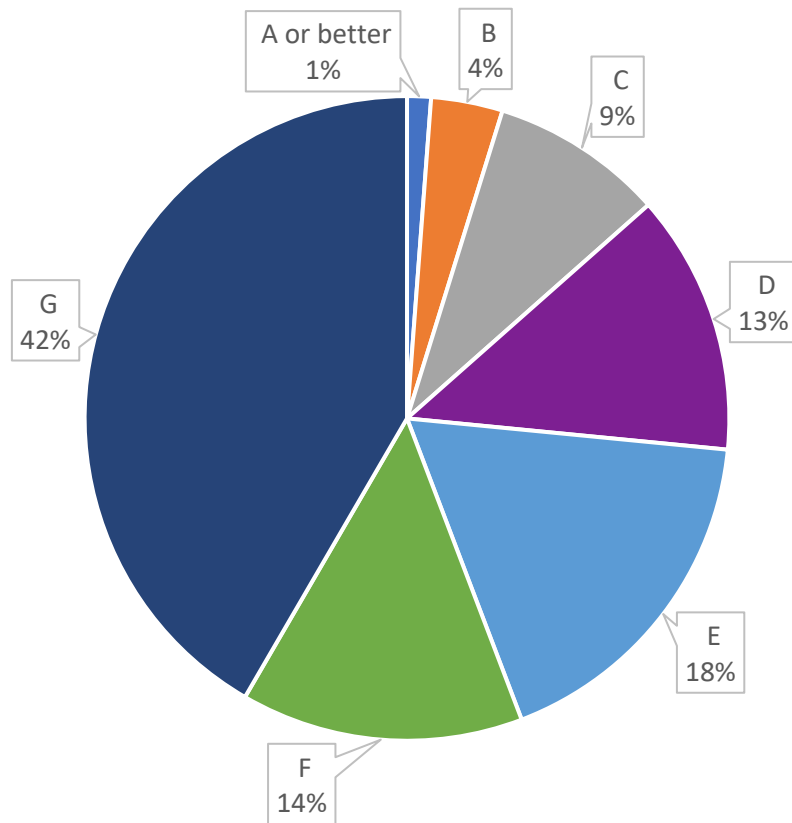


Figure 9-7 Overall Scotland non-domestic EPC profile

10. ANNEX 4 – Rationale for government involvement and summary of Existing Scottish Government Initiatives

10.1 Rationale for government intervention

A starting point for considering the case for government intervention in the heat (or any other) market, is to ask whether market failures exist. That is, are there specific issues that prevent private finance providers and potential customers getting together at scale to grow a market? If so, there is a sound case for government involvement.

Within heat in buildings, it can be argued that a range of market failures exist, including around split incentives (an illustration of the principal-agent problem), externalities and information asymmetries⁵². The split incentive problem – which is discussed in greater detail in section 4.2.4 – basically arises as landlord and tenant interests do not align in a way that supports installation of ZDEH solutions and/or energy efficiency measures, as landlords would typically incur the costs, while tenants experience the benefits.

Externalities arise when a cost or benefit is experienced which is not directly captured within a price mechanism. Externalities exist within heat in buildings, as society and the environment in general would benefit if heat was generated by non-fossil fuel means, although the costs that individual consumers incur do not fully reflect this benefit, therefore weakening the incentive for any individual to install and use ZDEH solutions.

Information asymmetries are another important market failure that exists in various forms within heat in buildings. From a consumer perspective, individuals understand gas boilers and heating systems using fossil fuels, although most people lack confidence with ZDEH systems because they do not know what solutions will work best for them, the potential lifetime benefits of new systems compared to gas boilers, or the energy efficiency requirements to ensure technologies like heat pumps work optimally. From a finance providers perspective, there are information asymmetries around the level of demand and nature of risks associated with lending for products which are not widely used in the UK. This combines to constrain consumer demand for ZDEH and provider supply of financial products to help fund installations.

Flowing from this, there is a strong case for government intervention, not only to resolve market failures, but also to spur innovation and lead by example, particularly in the short term, to support market creation and maturation.

10.2 Existing Support

The Scottish Government currently provides free and impartial advice, support and in some cases finance, through Home Energy Scotland (HES), Local Energy Scotland (LES), the Green Public Sector Estate Decarbonisation and Business Energy Scotland (BES).

⁵² [The economics of the Green Investment Bank: costs and benefits, rationale and value for money \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)

- The HES advice service provides in-depth advice to householders and landlords on low and zero emissions heating technologies, other domestic renewables, and more complex energy efficiency improvements. It acts as a referral scheme for the Scottish Government funded financial support schemes. These include our Area-Based Schemes (ABS) and its flagship fuel poverty scheme, Warmer Homes Scotland, which provides installation of grant funded heating and energy efficiency measures. It is also a gateway to domestic grants and loans programmes for heat and energy efficiency improvements, including the PRS Landlord Loan scheme and HES Grant and Loan Scheme.
 - The new HES grant provides funding for heat pumps up to £7,500 and for energy efficiency improvements – up to 75% of the combined cost of the improvements and up to the maximum grant amount of £7,500. A rural uplift of £1,500 applies to both the heat pump and energy efficiency grants. This uplift increases the heat pump grant flat rate and the maximum limit of the energy efficiency grant to £9,000. An additional £7,500 of funding is available as an optional interest free loan for both heat pumps and energy efficiency measures.
- LES manages the Community and Renewable Energy Scheme (CARES), which helps communities to engage with and benefit from the energy transition to Net Zero emissions. It provides advice and support – including funding – to communities across Scotland, looking to develop renewable energy, heat decarbonisation and energy efficiency projects. This includes –
 - The [Community Buildings Fund](#), which supports community organisations to decarbonise their buildings. This support takes a whole building retrofit approach, covering zero emissions heat installations, energy efficiency measures, and additional small-scale generation where there is a clear benefit to the community organisation in terms of energy bill reduction;
 - The [Off Electricity Grid Communities Fund](#), which provides a package of support to some of Scotland’s more remote and rural off-grid communities to help them upgrade their energy systems and decarbonise their energy supplies, with the aim of making them more resilient and sustainable; and
 - The [Community Heat Development Programme](#), which helps eligible community organisations and groups of householders to develop their ideas for locally-generated, low and zero carbon heat project ideas.
- BES provides advice to SMEs implementing energy efficiency and heat decarbonisation measures, with the aim of reducing carbon emissions, cutting running costs for organisations, and increasing economic competitiveness. It is responsible for signposting businesses to the SME Loan and Cashback Scheme and for producing the bespoke assessment reports that are a prerequisite for application.

The Scottish Government currently provides strategic and grant support to develop large scale decarbonisation projects through the Green Public Sector Estate Decarbonisation Scheme (GPSEDS), the Social Housing Net Zero Heat Fund

(SHNZF), Scotland's Heat Network Support Unit (HNSU), and Scotland's Heat Network Fund (HNF) –

- **GPSEDS** will invest a minimum of £200 million in this parliament in the public sector to develop and deliver a comprehensive offer of support for public bodies across Scotland. GPSEDS consist of three components including, the Scottish Public Sector Energy Efficiency Loan Scheme, the Scottish Central Government Energy Efficiency Grant Fund, and the Scottish Public Sector Non-Domestic Energy Efficiency Frameworks (NDEEF) and Project Support Unit (PSU);
- **HNSU** will support the growth of heat networks by addressing key challenges in the pre-capital stages of heat network development and building capacity across the public sector to deliver successful projects;
- **HNF** has made available £300 million to support the development and rollout of zero emission heat networks across Scotland. This fund aims to stimulate commercial interest, private investment and maximise Scotland's vast potential in the low carbon sector, whilst contributing to the positive progress on reducing Scotland's greenhouse gas emissions; and
- **SHNZF** provides grant funding to support social housing landlords across Scotland to install zero emissions heating systems and energy efficiency measures across their existing housing stock. We have made £200 million available.

Many households already choose to use private financing to pay for their heating systems, with options and products offering zero or low interest finance often offered by installers to help create a smooth customer journey. These offerings and products will continue to evolve over the coming years, and will be influenced by the regulations that the Scottish Government is proposing to introduce.

Overview of building composition – while there can be overlap between the categories on which we have focused in this report, we have, nevertheless, tended to concentrate on issues impacting buildings with the following ownership structures

- **Owner-occupier** – accounting for almost 1.5 million properties, these are homes where the occupier also owns the property, either outright or through a mortgage. The Scottish Government proposes to introduce regulations from 2025 onwards, requiring owner-occupier buildings to meet a level equivalent to EPC C, where it is technically feasible and cost-effective to do so, by 2033, bringing forward the previously proposed backstop from 2040.
- **Private Rented Sector (PRS)** – accounting for around 312,000 properties, these are homes which are privately owned and rented out. Almost 75% of private landlords only have one property, 24% just 2 properties, and only 1% have three or more properties. To help to make the heating bills of those living in those homes more affordable, the Scottish Government has committed to the introduction of Regulations to ensure private rented properties reach a minimum standard equivalent to EPC C, where technically feasible and cost-effective to do so, on change of tenancy, by 2028.

- **Multiple Occupancy Multiple Use (MoMU)** – flats, which account for around 900,000 properties, are often found in MoMU buildings, where residents include owner occupiers, private and social renters, with commercial premises sometimes occupying the ground floor. Currently 61% of dwellings in MoMU buildings are rated EPC C or better, with 36% rated EPC D or E and 4% rated EPC F or G.
- **Non-domestic** – accounting for around 200,000 properties with estimated costs to transition to Net Zero heating totalling around £6 billion. Only 15% of non-domestic buildings have an equivalent EPC rating of C or better with almost 75% rated EPC E or worse and an average EPC equivalent rating of G. The target levels of energy efficiency / decarbonisation of emissions have yet to be proposed.

11. ANNEX 5 - Wider explanation of the market pillars

The GHFT recognises that there are major interdependencies⁵³ for finance with other essential components of the market, that are also critically important to be in place for building owners to be able to improve the energy efficiency and decarbonise heat sources in their buildings by 2045.

This annex focuses on those other elements of the market which the Taskforce has indicated must also be developed so that government incentives, twinned with regulatory targets, can create a demand for improvement works by building owners, that can then be financed through the private sector and successfully executed by the supply chain.

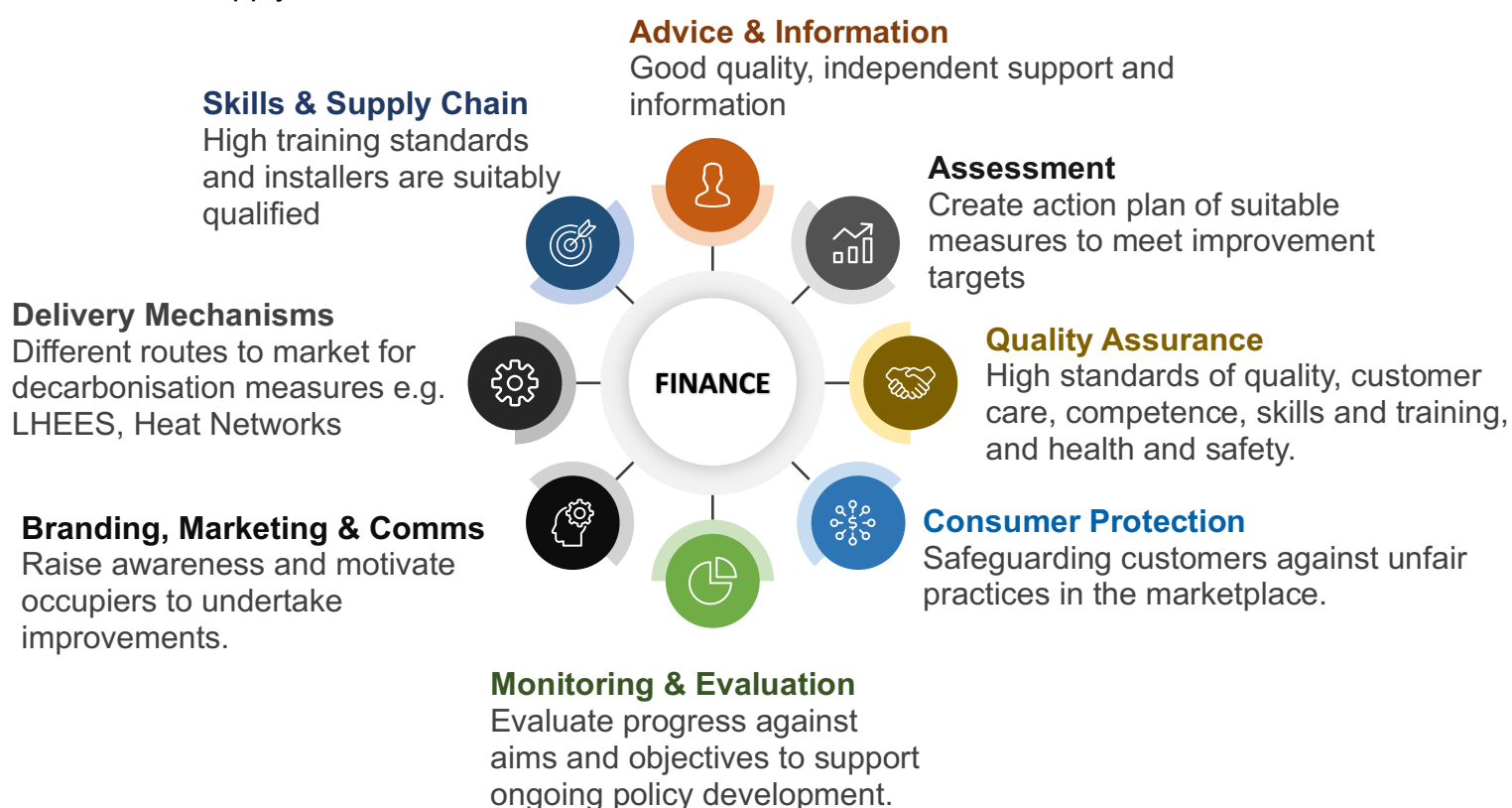


Diagram 1 Pillars of a market framework to foster energy efficiency market

In recent years the Scottish Government has been working on developing the pillars of the market framework for accelerating growth in decarbonising Scotland's buildings. It contributed its findings to the EU funded Energy Efficient Mortgages Initiative (EEMI) between 2020 and 2023⁵⁴. The pillars of a market framework diagram above outlines the key pillars of the whole market chain, when implementing energy efficiency (and decarbonisation of heat) improvements to a home (or a non-domestic building). These pillars highlight the interdependency of financing and

⁵³ Taken from the EEMI 'Current and Future developments of the market framework for accelerating growth of energy efficiency – learnings from Scotland and Trento?' Report: [Current-and-Future-developments-of-the-market-framework-for-accelerating-growth-of-energy-efficiency—learnings-from-Scotland-and-Trento.pdf \(energyefficientmortgages.eu\)](#)

⁵⁴ For more detail on EEMIP and access to reports, please see: [EEMI – Funding the hope for a better ... \(energyefficientmortgages.eu\)](#)

funding with the other six aspects of the market framework. Below is the definition of each pillar as set out in the report for EEMI and a summary of what the Scottish Government is doing to develop these pillars to ensure market supply and demand enabling the uptake of finance mechanisms to fund the works.

Delivery Mechanisms and Skills & Supply – “To provide support and actively promote the opportunities of the market in energy efficiency [...] [and decarbonisation of heat] in buildings for companies in the jurisdictions, as well as ensuring that the quality of the work carried out by the supply chain is of a high standard and that installers are suitably qualified.”

The Scottish Government, along with its partners, is identifying, creating and developing delivery and support opportunities to incentivise the market through a variety of mechanisms –

- Local Heat and Energy Efficiency Strategies (LHEES)⁵⁵. Partnership working with local government to develop area-based, locally-led heat planning, coordination and delivery of the heat transitions across Scotland.
- Heat networks⁵⁶. The [Heat Networks \(Scotland\) Act 2021](#) sets out statutory targets for the amount of heat to be supplied by heat networks to Scottish Buildings by 2027 and 2030 respectively. The Heat Networks Delivery Plan will contribute to increasing the use of heat networks in Scotland and meeting the statutory targets.
- The Heat Network Fund recognises that targets for heat network deployment will require a substantial growth in supply chains, and the £300 million capital grant funding which is now available to public and private sector organisations will support this growth.
- To assist with the pre-capital stage of heat network development, the Heat Network Support Unit aims to identify prospective heat network projects and support their development through advice and grant funding, building capacity and expertise across the public and private sector in Scotland.
- The Energy Efficiency Standard for Social Housing 2 (EESH2)⁵⁷ review is looking at the 2025 and 2032 milestones for achieving the Scottish Government’s ambitious climate change emissions reduction targets. Although not 100% directly funded by the Scottish Government, the Social Housing Net Zero Heat Fund has been designed to accelerate the delivery of energy efficient zero emissions heating systems to social housing projects across Scotland.
- Community and Renewable Energy Schemes (CARES)⁵⁸ have a huge potential to help local communities reduce carbon emissions, create local jobs, upskill local people, reduce energy costs and overall allow greater investment in local economies, providing a significant contributions to Scotland’s Net Zero ambitions. CARES, delivered on the Scottish Government’s behalf by Local Energy Scotland, provides dedicated support to communities looking to engage with,

⁵⁵ For more detail please go to the Scottish Government Website: [Local heat and energy efficiency strategies and delivery plans: guidance - gov.scot \(www.gov.scot\)](#)

⁵⁶ For more details on the Heat networks delivery plan: [Heat networks delivery plan - gov.scot \(www.gov.scot\)](#) , the Heat Networks Fund: [Heat Network Fund: application guidance - gov.scot \(www.gov.scot\)](#) , and the heat networks support unit: [Home - Heat Network Support Unit](#)

⁵⁷ [Energy efficiency in social housing - Home energy and fuel poverty - gov.scot \(www.gov.scot\)](#)

⁵⁸ [Local Energy Scotland programme CARES - Energy Saving Trust](#)

participate in and benefit from the energy transition to Net Zero. Projects covering the breadth of Scotland have been supported, helping to provide clean, green power and heat, and enabling them to continue to deliver essential local services, making a tangible difference to communities.

- Business Energy Scotland is a national service, covering the whole of Scotland provides free advice, impartial support and access to funding to help SMEs save energy, carbon and money⁵⁹.
- The SME Loan and Cashback scheme provides interest free loans of between £1,000 to £100,000 with up to £20,000 cashback, which can be used to finance the installation of energy efficient systems, equipment or building fabric⁶⁰.
- Working in partnership with the Green Heat Sector, the Scottish Government is supporting the skills and supply sector through initiatives such as the Green Jobs Workforce Academy⁶¹ and funding for apprentices through the Low Carbon Skills Grant, as well as providing 75% of the initial fees required to become a Microgeneration Certification Scheme (MCS) approved supplier⁶². The Heat in Buildings Supply Chains Delivery Plan sets out the practical steps that are being taken to support the growth of the green heat sector⁶³.

Advice and information – “To provide all households with access to good quality, independent advice and information on improving the energy efficiency of their property and reducing their fuel bills.”

The Scottish Government’s new dedicated National Public Energy Agency: Heat and Energy Efficient Scotland (the Agency) will provide the leadership and coordination required to accelerate the delivery of the decarbonisation of heat in Scotland⁶⁴. Its initial focus will be to work with delivery partners to bring about more effective cross programme coordination and to aid public understanding and awareness of the changes required to Scotland’s homes and buildings as we transition to Net Zero by 2045. It is important to note that the Agency is not starting from scratch, rather building upon several existing delivery programmes listed below –

- Heat in Building Area-Based Schemes
- Warmer Homes Scotland Scheme
- Home Energy Scotland Advice Service
- Home Energy Scotland Grant and Loan
- Business Energy Scotland Advice Service
- SME Loan and Cashback
- Heat Networks Fund
- Social Housing Net Zero Heat Fund
- Green Public Sector Estate Decarbonisation Scheme.

⁵⁹ [Business Energy Scotland · Make Your Business Greener](#)

⁶⁰ [SME Loan Scheme · Business Energy Scotland](#)

⁶¹ [New Green Jobs Workforce Academy - gov.scot \(www.gov.scot\)](#)

⁶² [MCS Certification Fund - Energy Saving Trust](#)

⁶³ [Towards an Industry for Green Heat: heat in buildings supply chains delivery plan - gov.scot \(www.gov.scot\)](#)

⁶⁴ [Accelerating green heat delivery - gov.scot \(www.gov.scot\)](#)

A customer journey has also been developed for borrowers to ensure that financial lending and advice is part of the process, alongside delivery support for implementing the energy efficiency measures (and zero emission heating).

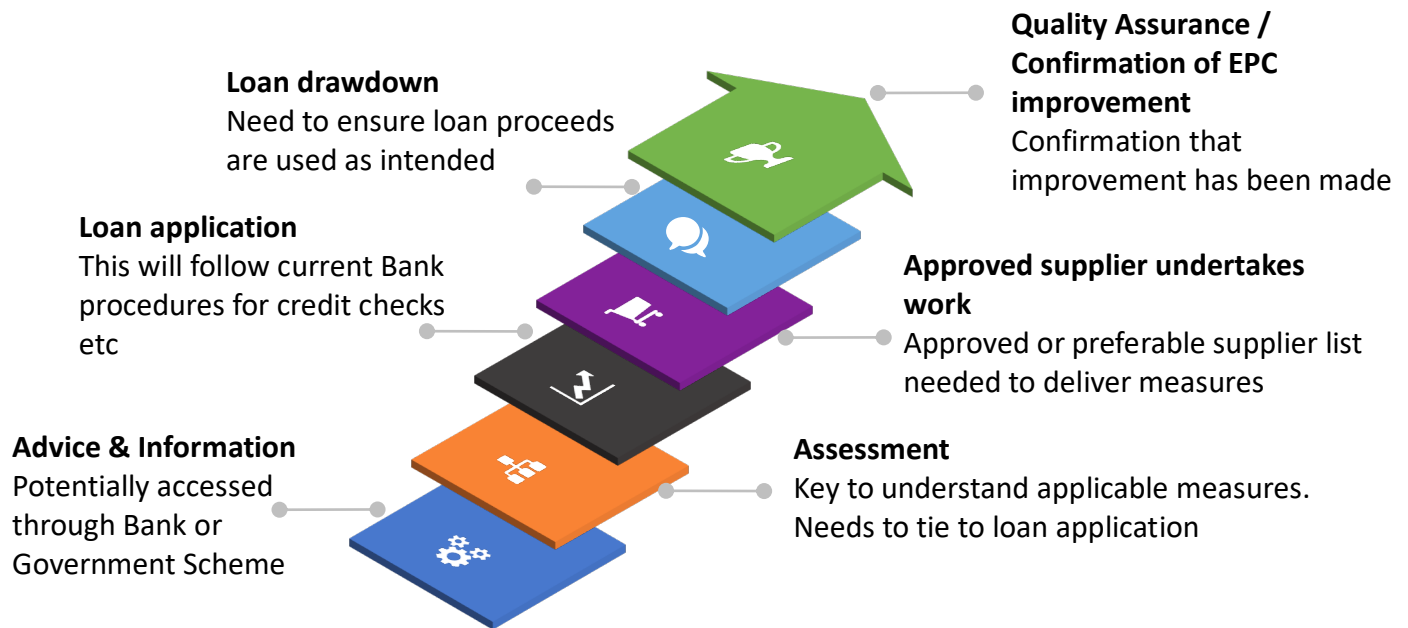


Figure 11-1 Customer journey taken from EEMI: Technical Report on optimal value chain of actors, relationships and resources in demonstrator jurisdictions.

Branding, Marketing and Communication – “To build communications that motivate owners and occupiers to access the advice and support on offer, based on a strong brand for the Programme that inspires trust and raises awareness, as well as targeted messages for each sector that make the case for improving energy efficiency.”

The Taskforce recognises that there are mindset barriers to the uptake of low carbon heat solutions. Consumer awareness of what retrofit looks like, what the benefits are, who to speak to and how to make the changes, are essential to encourage building owners to make the switch, which in turn will increase demand for contractors to do the works and begin to generate a market sizeable enough to support private finance sector offers.

The Scottish Government recognises the need for communications that encourage owners and occupiers of buildings to access the advice and support that is on offer and so has developed a strong brand programme which will be continued on by the Agency.



Figure 11-2. Existing Official Branding

Government schemes, ways to tackle scams and mis-selling, and how to improve public engagement⁶⁷

The statement commits the Scottish Government to require applicants carrying out energy efficiency work under the new Home Energy Scotland Grants and Loans scheme to use TrustMark registered businesses when available and retains requirements for Microgeneration Certification Scheme (MCS) approved suppliers for microgeneration work. It also commits the Scottish Government to work with stakeholders, including Trading Standards Scotland, to counteract scams and support enforcement action against those traders who do not fulfil their obligations.

By requiring improved standards for Scottish Government schemes, and by supporting consumers to access trusted suppliers while avoiding bad actors, it is hoped that this will encourage a greater level of skills and competence in the industry more generally and foster a more secure sector that customers can be confident in regardless of how their work is funded.

Consumer Protection – “Safeguarding consumers against unfair practices in the marketplace.” Access to independent, free and efficient redress when something goes wrong is a key element in building trust and encouraging take up of retrofit and low carbon heating solutions.

While consumer redress, protection and enforcement powers are not devolved to the Scottish Government (they are to the Northern Ireland Assembly) the Taskforce advocates working with the bodies that already exist to handle complaints. The Financial Ombudsman Service has statutory powers where a regulated financial product is in place, energy suppliers and networks are under the mandatory jurisdiction of the Energy Ombudsman - in due course that will extend to heat networks. Other ombudsman and alternative dispute resolution services provide access to redress but there are gaps and overlaps and engagement by traders is voluntary. There is recognition in the paper “Heat in Buildings – Quality Assurance: Policy Statement”⁶⁸ that there is a need to improve access to redress. Trading Standards is responsible for protection and enforcement.

Monitoring and Evaluation – “To monitor and evaluate progress to ensure that aims and objectives are met. This monitoring and evaluation should allow for adaptation and flexibility where necessary.”

The Scottish Government currently monitors progress on emissions from buildings through the climate change updates every four years, certain elements are also covered through the Scottish House Condition Survey and they will also be publishing a Monitoring and Evaluation framework in 2023 to help measure progress against the commitments made in the Heat in Buildings Strategy⁶⁹. All Scottish Government Heat in Buildings delivery plans will have evaluation built into them, so that lessons are learned to inform future approaches.

⁶⁷ [The Heat in Buildings Quality Assurance policy statement](#)

⁶⁸ [Heat in Buildings strategy - quality assurance: policy statement - gov.scot \(www.gov.scot\)](#)

⁶⁹ More details about the Scottish Housing Condition survey can be found here: [Scottish House Condition Survey - gov.scot \(www.gov.scot\)](#)

12. ANNEX 6 – Glossary

ABS: Area-Based Schemes
BES: Business Energy Scotland
BTL: Buy-to-Let
CARES: Community and Renewable energy Scheme
CCA: Consumer Credit Act 1974
CEEF: Central and Eastern European Fund (EU)
DHLF: District Heating Loan Fund
EBRD: European Bank for Reconstruction and Development
EED: Energy Efficiency Directive
EEEF: European Energy Efficiency Fund
EEMI: Energy Efficiency Mortgages Initiative
EESH: Energy Efficiency Standard for Social Housing
ESA: Energy Service Agreement
EPC: Energy Performance Certificates, or Energy Performance Contract
ESCo: Energy service company
ESG: Environmental, social and corporate governance
EST: Energy Savings Trust
FCA: Financial Conduct Authority
GFI: Green Finance Institute
GHFT: Green Heat Finance Taskforce
GP: General Practitioner
GPSEDS: Green Public Sector Estate Decarbonisation Scheme
HaaS: Heat as a Service
HEEPS ABS: Home Energy Efficiency Programmes Area-Based Schemes
HES: Home Energy Scotland
HiB: Heat in buildings
HM Treasury: His Majesty's Treasury
HNF: Heat Network Fund
HNSU: Scotland's Heat Network Support Unit
IFC: International Finance Corporation
IMLA: Intermediary Mortgage Lenders' Association
JV: Joint venture
KfW: Kreditanstalt für Wiederaufbau
LA: Local Authority
LBTT: Land and buildings transaction tax
LCITP: Low Carbon Infrastructure Transition Programme
LES: Local Energy Scotland
LHEES: Local heat and energy efficiency strategies
LTV: Loan to Value
MCS: Microgeneration Certification Scheme
MoMU: Multiple Occupancy Multiple Use
NDEEF: Non-Domestic Energy Efficiency Frameworks
NDR: Non-Domestic Rates
NRW: German Bank
NSET: National Strategy for Economic Transformation
OFGEM: Office of Gas and Electricity Markets
OO: Owner Occupier
PAS: Publicly Available Specification

PLF: Property Linked Finance
PRS: Private rented sector
PSU: Project Support Unit
PWLB: Public Works Loan Board
RLF: Revolving loan fund
RSL: Registered Social Landlord
SCDI: Scottish Council for Development and Industry
SHNZHF: Social Housing Next Zero Heat Fund
SMEs: Small and medium-sized enterprises
LTV: Loan To Value
VAT: Value Added Tax
ZDEH: Zero direct emissions heating



© Crown copyright 2023

OGL

This publication is licensed under the terms of the Open Government Licence v3.0 except where otherwise stated. To view this licence, visit nationalarchives.gov.uk/doc/open-government-licence/version/3 or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or email: psi@nationalarchives.gsi.gov.uk.

Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.

This publication is available at www.gov.scot

Any enquiries regarding this publication should be sent to us at

The Scottish Government
St Andrew's House
Edinburgh
EH1 3DG

ISBN: 978-1-83521-641-5

Published by The Scottish Government, November 2023

Produced for The Scottish Government by APS Group Scotland, 21 Tennant Street, Edinburgh EH6 5NA
PPDAS1303742 (11/23)

W W W . g o v . s c o t