South West
NET ZERO
HUB

ABLE TO PAY RETROFIT LOAN FUND BUSINESS CASE

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A REPORT COMMISSIONED BY THE SOUTH WEST NET ZERO HUB, WRITTEN BY GEMSERV

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1 EXECUTIVE SUMMARY

1.1 Introduction

1.1.1 The South West Net Zero Hub (SWNZH) commissioned Gemserv and our partners to develop a business case for an Able to Pay Loan Fund, conducting a high-level appraisal of the opportunity in the region, aimed at testing the validity of a joint public/private funded loan fund that will support the installation of retrofit measures such as low carbon heating and insulation to reduce the carbon emissions and energy demand for homes in the 'able to pay' homeowner sector in the South West. The West of England Combined Authority - the regional M10 host authority for the SWNZH and prospective fund sponsor - provided informed partner Green Book Business Case critique and review.

1.2 The South West Region

1.2.1 The South West Net Zero Hub (SWNZH) is one of five Net Zero hubs in England, and comprises of seven Local Enterprise Partnership (LEP) areas, including over 40 Local Authorities (LAs), and hosted by the West of England Combined Authority (referred to here as the Combined Authority). The purpose of the SWNZH is to establish and develop low carbon energy projects across the South West. The Hub's objectives include:

- Increase the number, quality and scale of local energy projects being delivered;
- Raise awareness of the opportunity for, and benefits of, local energy investment;
- Enable local organisations and community groups to attract private and/or public finance for energy projects;
- Support and deliver national and local Government schemes; and
- Collaboration, co-ordination and sharing of best practice.

1.3 The Case for Change

1.3.1 The UK government has set a legal target of reaching Net Zero by 2050. Buildings remain the second biggest emitter of carbon on a national scale, accounting for 17% of 2022 carbon emissions[1], and having experienced no substantive reduction in emissions since 2010, reduction in carbon emissions for the heating and buildings sector has stalled. A significant proportion of buildings in the UK are homes, and almost 65% of homes in the UK are owner-occupied. This means that efforts to decarbonise the UK's buildings sector must involve measures to decarbonise the owner occupier sector.

1.3.2 This challenge is more acute in the South West as a region than it is nationally. In response to the National Net Zero target of 2050 many LAs in the South West have declared Climate Emergencies, and set Net Zero targets of 2030, well ahead of the national requirements, but

[1] Progress in reducing emissions: 2023 report to Parliament. Climate Change Committee

reflecting advanced consumer attitudes on climate awareness and overall decarbonisation agendas compared to national attitudes.

1.3.3 The scale of the challenge has been elucidated in previous work undertaken by Gemserv[2] in the 'retrofit skills report' which found that the South West region requires installation of over 2.5 million air source heat pumps and 485,000 ground source heat pumps to reach net zero. In terms of insulation, the South West requires 1.4 million installations of solid and cavity wall insulation to meet net zero. It further found that "…at current deployment rates for each measure it would take the following amount of time to meet net zero:

- 600 years to deploy enough solid wall insulation measures.
- 132 years to deploy sufficient loft insulation and 166 years to deploy sufficient cavity wall insulation.
- 200 years to install sufficient air source heat pumps, and 278 years to install sufficient ground source heat pumps."

1.3.4 Despite the challenges, the value of these installations are significant to the South West as a region. The retrofit skills report found the following economic impacts, with a total GVA contribution of £21.7bn by 2050. This included:

- Construction, servicing, and trade of insulation could contribute £4.4bn in GVA by 2050
- Construction, servicing, and manufacture of heat pumps, could contribute £17.4bn GVA by 2050
- Annual consumer bills could be reduced by over £1bn
- 392,000 properties could be retrofitted at payback of 5 years or less

1.4 The Policy Gap

1.4.1 The current policy landscape is insufficient to meet the challenge of decarbonising the building stock in the UK. Current UK retrofit policy and associated funding mechanisms are focussed on the social sector and addressing fuel poverty (see Table 1)

Table 1 – Current UK domestic retrofit funds

Fund name	Fund Value	Description
Great British Insulation Scheme (Energy Company Obligation – ECO)	£1 billion	Drive uptake of energy efficiency measures among low income and vulnerable households in, or at risk of, fuel poverty, and extend the scheme to those able to contribute
Heat Pump Investment Accelerator Competition	£30 million	Drive investment in domestic manufacturing of heat pumps.
Home upgrade grant (HUG) Phase 1	£218 million	For low-income households with homes that are off the gas grid through the HUG scheme
Home upgrade grant (HUG) Phase 2	£630 million	Funding for local authorities to improve the energy performance and heating systems of off gas grid homes in England.

[2] https://www.swnetzerohub.org.uk/document/south-west-net-zero-hub-retrofit-skills-report/

Fund name	Fund Value	Description
Local authority delivery grant (LAD) Phase 1	£500 million	The LAD scheme aims to raise the energy efficiency of low income and low energy performance homes with a focus on energy performance certificate (EPC) ratings of E, F or G.
Local Authority Delivery grant (LAD) Phase 2	£300 million	Funding for Local Net Zero Hubs to deliver energy efficiency upgrades in low-income homes.
Green Homes Grant	£256 million	Offered homeowners the opportunity to apply for up to £5,000 funding to install energy efficiency improvements and low carbon heat measures in their homes.
Getting Building Fund	£900 million	Deliver jobs, skills and infrastructure across the country relating to the built environment.
Boiler Upgrade Scheme	£450 million	Incentivise the uptake of heat pumps by offering a grant to homeowners considering installation.

1.4.2 However, 64 per cent of the UK's housing stock is owner occupier[3]. This is nearly 15 million households in the UK which lack dedicated funding and financial support to retrofit their homes. Most of these households are ineligible for support either because they are owner-occupied, or because they are not classified as fuel poor (<£30,000 household income or receiving qualifying benefits).

1.4.3 The Climate Change Committee recognises that lack of support for the non-fuel-poor sector remains the most significant policy gap in the buildings sector, requiring government response to outstanding consultations, and clear, consistent policy and lending frameworks to drive investment and uptake of energy efficiency and low-carbon heating solutions in this sector.

1.4.4 The South West Net Zero Hub has recognised this clear gap, and following work undertaken in the region identifying skills and installation gaps, has set out requirements to investigate the potential for a loan fund, focussed on providing affordable finance for homeowners wishing to undertake significant retrofit of property, and demonstrating the potential for public finance to motivate the inclusion of private finance investment.

1.5 Project Aims and Objectives

1.5.1 The project aims to develop a successful business case for the establishment of an Able to Pay Loan Fund. To do this it must meet the following criteria:

- To outline core design features of the Able to Pay Loan Fund (eligibility, technologies in scope, size of loan, average size of investment, fund structure, quantum of investment, etc)
- Establish a robust case to secure public and private funding to establish the first Able to Pay loan fund in England.

[3] Statista. Available here https://www.statista.com/statistics/286503/england-propportion-of-owner-occupied-households/

- Establish the decarbonisation benefits of such a fund and to evidence its contribution to local and national net zero targets
- To demonstrate financial, practical, and social benefits to borrowers/homeowners
- To improve upon previous loan offerings by providing simple, personal loans to consumers, facilitating easy repayment and potential early repayment
- To quantify and manage the risk to Department for Energy Security and Net Zero (DESNZ), the West of England Combined Authority, investors, borrowers and the Fund Manager
- The project is designed to address the criteria above, representing considerations for a loan fund compared to a singular point in time (modelling date), and considerations around relevant interest rates and gilt yields reflect that point in time. Flexibility has been built into the provided modelling that can be used to accommodate future changes if necessary. Specifically, at the time of modelling (start of September 2023), our proposed interest rates were benchmarked against the following:
    - The UK 10-year government bond yield was at ~4.5%[4]
    - Bank of England Base Rate was at 5.25%
    - Low interest rates example - Fully government-funded loan, therefore low rate (benchmarked Basingstoke & Deane EE Loans) at 4.49%
    - Base interest rates example - Private sector loan scheme that targets/attracts their existing clients, hence offering a lower rate for a fixed term (benchmarked Barclays Green Home Mortgages) - 6.10%
    - High interest rates example - More typical private sector loan scheme rate after a fixed term with a lower rate (benchmarked Barclays Green Home Mortgages) - 8.60%

1.6 Methodology

1.6.1 The project team undertook a rigorous process to develop the business case. Gemserv and partners have followed Government Green Book methodology to construct a Business Case, investigating the Strategic case for intervention; the Economic case and benefits realisation; the Commercial and legal practicalities for the intervention; developing a Financial case and model for intervention; and summarising considerations for the Management case.

1.6.2 To summarise, we:

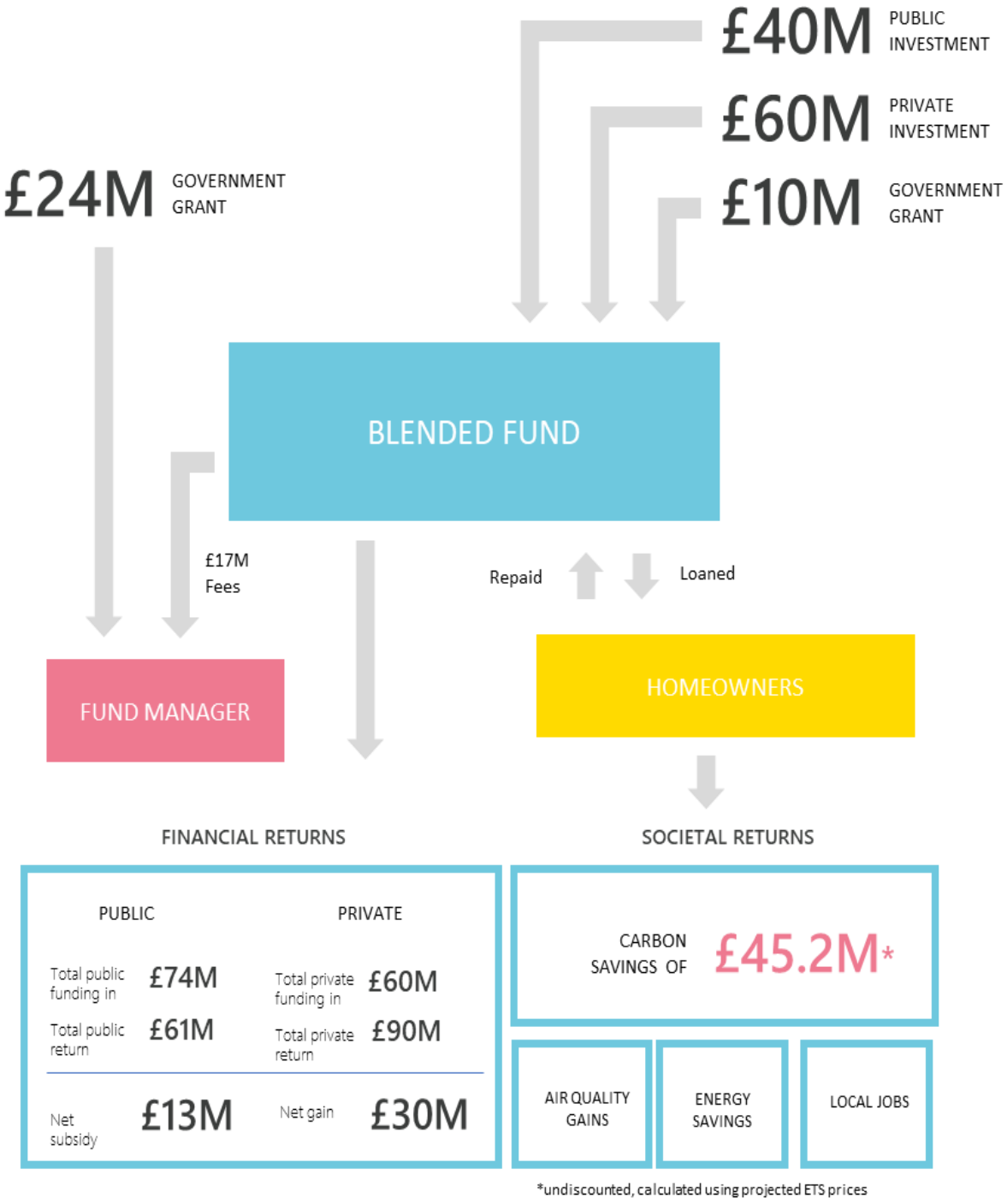
- Undertook a detailed literature review to identify and quantify the policy gap and
- Carried out research to understand the range of fund options in the UK and internationally, identifying the key elements of successful loan funds.
- Agreed/justified strategic targeting with assistance from SWNZH/CA.

[4] UK 10 Year Gilt Bond Yield - Quote - Chart - Historical Data - News (tradingeconomics.com)

- Followed Green Book methodology to validate the economic case for intervention, combined with benefits.
- Engaged with private finance and public sector bodies to better understand their expectations, reservations and opportunities around the fund.
- Developed a bespoke model based on the strategic interventions and finance considerations.
- Undertook a legal review of proposed solution to determine best path forward.
- Green Book methodology for commercial and management.

1.7 Findings

Figure 1 - Fund overview



1.7.1 This report identifies key drivers and barriers to retrofit, and sets Strategic Objectives for the prospective fund – specifically:

- To accelerate the uptake of Permitted Energy Technologies (as defined in the Strategic Case, comprising energy efficiency and heat decarbonisation measures) in domestic properties in Target Local Authorities, by providing affordable finance to the owner-occupier sector
- To enhance the supply chain within this sector by:

- Supporting the accelerated growth of the low and zero carbon contractor / skills base operating within Target Local Authorities
- Supporting growth and capacity within the financial sector able to manage and administer large scale able to pay funds in this sector

1.7.2 Our analysis has identified £17bn of measures eligible for installation across the specified region. We define those measure that are eligible for installation in line with current government programmes and incentives. We established demand for over 2.5 million measures in the South West alone, with over 500,000 installations of air source heat pumps, solar PV, battery storage and lighting.

1.7.3 We determined the minimum loan amount based on the minimum value to install a heat pump based on Boiler Upgrade Statistics and assuming use of public subsidy. We calculated affordability of proposed loan values using typical household incomes, mortgages and expenditure. We concluded that the minimum loan value should be set at £7.5k with a minimum household income of £40k.

1.7.4 Following Green Book methodology, the Economic case finds that a blended public and private loan scheme could deliver a Social Net Present Value of £212 million over an appraisal period of 20 years, with more than 376,000 tonnes of CO_2 equivalent greenhouse gas savings at a carbon effectiveness of subsidy of 13.9 (kgCO2e / £ subsidy). Additionally, a blended able to pay scheme could create up to 543 cumulative FTE jobs and deliver a wide range of other non-monetised benefits.

1.7.5 We undertook engagement with private sector investors to inform key financial requirements for attracting private sector investors, including informing rates of return and interest rates payable by consumers, and created a bespoke financial model illustrating the fund performance over its lending lifetime.

1.7.6 We propose a Limited Partnership structure facilitating tax-efficient investment and management of the fund, following benefits appraisal of structures used in currently available funds, in both the retrofits sector and wider comparable scenarios, and a legal review of requirements based on the current understanding of investor profiles.

1.7.7 Incorporating findings from engagements and strategic objectives, we have designed a bespoke financial model laying out the overall proposal for the loan fund (to be viewed in conjunction with the Financial Case). We propose a fund blending public and private finance, with total investment of £100million, split £40m public funds, and £60m private funds. In order to attract private investment, the investment will realise ~3%IRR for the public sector, and ~8%IRR for the private sector, while charging the consumer around 6% interest on the loan.

1.7.8 The investment is separate from fees required for Fund Manager operations, totalling at an additional £34million over the lifetime of the fund. Gross public sector funding is modelled to total £74million, incorporating £40m gross public investment in the ATP Fund, plus an estimated £34million grant to support FM operations and underpin Fund profitability. After forecast returns on the public investment in the ATP Fund of ~£61m, that gross public sector

figure nets down considerably to a net public sector subsidy of ~£13m. However, not all of the investment is required at fund setup, given the 20-year life-cycle of the fund. This net public sector subsidy, through enabling wider investment, is calculated to save 376,000 tonnes of CO2e savings over the lifetime of the fund, as well as other non-monetised benefits.

1.7.9 We propose that a formal procurement is undertaken for the appointment of a Fund Manager /General Partner. This is unlikely to be a single entity/company given complexities around the nature of investment: this type of loan fund has not been attempted in the UK previously, and due consideration of relevant FCA permissions is paramount. Legal advice has suggested that it is unusual for a person/organisation with the full suite of regulatory permissions relevant to fund management to also have the full suite of permissions in relation to consumer credit lending, likely resulting in a consortia being established to undertake the role.

1.7.10 The management of this project will be further shaped with further confidence around investor identity and requirements. Key considerations are set out in the Management Case.

1.8 Our Recommendations for loan fund design

1.8.1 Our initial recommendations on the design of the loan fund are set out in the following table.

1.8.2 Recommendations:

Table 2 – Loan fund Key Features

CASE	TYPE	NAME	DESCRIPTION
Strategic	Fund eligibility	Homeowners as eligible cohort	The fund should be targeted at individuals who own their own homes, with exclusions for renters and private landlords. This allows a title restriction on property if necessary, reducing risk for public and private sector investors.
Strategic	Loan	Minimum loan size of £7,500	The minimum loan size should be £7,500 to ensure that homeowners can cover the cost of most permitted energy technologies, while also including scope for further works required to ensure that technologies function properly, and benefiting from existing government grant schemes for eligible technologies
Strategic	Measures	Permitted measures in line with existing Government initiatives	Allowing established measures ensures that the loan fund can benefit from existing consumer protection frameworks and installation standards, reducing risk to the scheme
Strategic	Assessment	Requirement for Retrofit Assessment/Coordination	We have modelled what we see as the typical packages reflecting the overall opportunity within the region. However, consumers must be allowed to control the measures being installed in their home. Each Loan application must be in line with a Retrofit Assessment to ensure that the measures being applied for are suitable for the home, be demonstrably affordable, but allow the consumer the right to choose which measures they want.
Strategic	Income	Minimum household income of £40,000	The minimum eligible household income should be no less than £40k to ensure that repayments take no more than 20% of expendable household income
Financial	Fund Metrics	10-year repayment period	Suggested repayment period, impacting monthly payments and affordability
Financial	Fund Metrics	~6% interest for consumers	Interest rate comparative to market alternatives, including Green Mortgages
Financial	Investment	Public investment to the Loan Fund	£40m public investment into the loan fund operating on a 3% IRR over the life of the fund
Financial	Investment	Private investment to the Loan Fund	£60m private investment into the fund, operating on 8% IRR over the life of the fund
Financial	Fund Management	Public Subsidy for Loan Fund management	£24m subsidy for Fund Manager operations, and £10m subsidy for invested funds. As public investment into the loan fund provides a return, overall subsidy is ~£13m
Commercial	Structure	Limited Partnership Structure	Limited Partnership provides suitable tax efficiency for investors, allows appointment of a suitable General Partner to manage the fund, and provides flexibility for further iterations of the fund.
Commercial	Structure	Appointment of a General Partner	The General Partner is likely to comprise of entities containing suitable suite of FCA permissions for both Fund Management and Consumer Credit lending.

1.9 Key Risks

1.9.1 This business case presents several areas of risk to the establishment of a loan fund and discusses mitigation in detail. While intricacies are discussed later on, these risks can be broadly assigned to the following categories:

- **Consumer interest**: no loan fund can be established without suitable consumer interest and appetite resulting in uptake. Further work will need to be undertaken in parallel to the setup of the fund to inform consumers and promote uptake, and is anticipated to continue during fund operation as a key function of the fund manager role.
- **Attracting suitable public sector investment, and attracting suitable private sector investment**: the financial viability of the loan fund requires both investment and grant funding to function as intended. The fund as designed functions on a blend of public and private sector investment, offering favourable terms to consumers by utilising public funding expecting lower rates of return and offering competitive returns to private sector. This blended fund delivers greater scale, and achieves benefits that would otherwise be out of reach from the public sector funds alone. The overall benefits assessed in the economic case cannot be achieved or demonstrated without attracting suitable levels of funding from both sectors.
- **Appointment of suitable organisations to operate the Scheme**: overall scheme management will likely comprise a party with a full suite of fund management permissions (Fund Manager), and a party with consumer credit permissions (Consumer Credit Lender). Effective procurement and management of these roles will be key for the continued success of the loan fund.
- **Interest rate variability**: the Fund's principle product is a loan offering, in which context loan interest pricing is a significant area of sensitivity / potential risk. Interest rate pricing will need to be competitive to attract homeowner uptake within the wider loan environment. Sensitivity and risk analysis sections of the Financial Case illustrate the significant variability in financial outcomes to the Fund relating to the interest rate charged to homeowners. In an environment where the long-term interest rate is not stable – which is arguably currently the case – there is a possibility that a Fund Manager would be required to hedge interest rate pricing exposure, which would involve additional costs. This risk should be monitored and explicitly discussed at procurement with prospective Fund Managers. A clear mitigation strategy in this context would be for the Fund Manager to react to market pricing changes by varying the interest rate charged to homeowners by (annual) lending tranche.
- **Supply chain capability and installation quality**: while one intended outcome of this fund is to bolster the supply chain, the overall capacity within the region remains a risk to successful operation of the fund (especially earlier on in its life cycle). The loan fund must also require compliance with established industry standards for assessment, installation and management, thus facilitating effective consumer redress within established mechanisms where required.

1.10 Next Steps

1.10.1 This business case demonstrates the rationale for intervention in the form of establishing affordable finance in the owner-occupier sector, both to address a significant policy gap and to support the region's progress towards its Net Zero targets. It also demonstrates how a fund of the proposed type could be established to attract private investment through providing suitable returns and quantifies the benefits that the proposed public sector investment/subsidy would bring when used to motivate the inclusion of private finance.

1.10.2 However, this alone will not be sufficient to establish the fund. To further support the development of this opportunity, we recommend that:

- **Engagement with potential investors from both the Public and Private Sector continues.** While positive engagement has already been undertaken with both sectors, uncertainty remains around certain elements, including source of funding and intentions for repayment. The recommended fund structure can accommodate some variability in these aspects: however certain elements will determine the attractiveness for investors, including whether the fund will be circular, the exact repayment requirements for each limited partner and shaping the overall downstream nature of the fund. This is discussed further in the Commercial case; but needs further exploration with interested parties. Establishing investment partners interest and requirements will also assist in the development of the management arrangements for this fund, as set out in the Management Case.
- **SWNZH undertakes consumer engagement within the target region**, establishing interest for the loan fund and undertaking significant advocacy/promotion work to drive interest (also expected to be part of the General Partner's activities). While the proposed £100m fund is intended to be a pilot, and is designed in a way that can provide suitable flexibility for adaptation to difference consumer sectors in future iterations, it remains reliant upon consumer uptake to demonstrate the financial viability of the fund. Elements of the downstream nature are key to consumer attractiveness here as well, particularly around possibilities for early repayment or fund mechanics where the original consumer moves house, and must be investigated alongside conversations with potential investors around the downstream nature of the fund to ensure attractiveness to investors and to consumers.
- **SWNZH must continue its work improving regional skills and supply chain availability** as set out in previous reports, to support and realise this opportunity.

STRATEGIC CASE

2 STRATEGIC CONTEXT

2.1 Situational Overview

2.1.1 The South West Net Zero Hub (SWNZH) is one of five Net Zero hubs in England, and comprises of seven Local Enterprise Partnership (LEP) areas, including nearly 40 Local Authorities (LAs), and hosted by the West of England Combined Authority (referred to here as the Combined Authority). A map of the area covered can be found here.

2.1.2 The purpose of the SWNZH is to establish and develop low carbon energy projects across the South West. The Hub's objectives include:

- Increase the number, quality and scale of local energy projects being delivered;
- Raise awareness of the opportunity for, and benefits of, local energy investment;
- Enable local organisations and community groups to attract private and/or public finance for energy projects;
- Support and deliver national and local Government schemes; and
- Collaboration, co-ordination and sharing of best practice.

2.1.3 In response to the National Net Zero target of 2050 many LAs in the South West have declared Climate Emergencies, and set Net Zero targets of 2030, well ahead of the national requirements, but reflecting advanced consumer attitudes on climate awareness and overall decarbonisation agendas compared to national attitudes. As described in the South West Net Zero Hub Retrofit Skills report[5], 86% of the population are concerned about climate change compared to an average of 83% across the UK, with regional citizens most likely to know about the requirement to change the way that we heat our homes. The wider region has further pioneering green credentials, with Bristol described as a leader in sustainability and being cited as the UK's first ever European Green Capital in 2015. The region is largely rural, but includes major cities in the form of Exeter, Plymouth, Bath, Bristol, Portsmouth, and Southampton.

2.1.4 The South West Net Zero Hub Skills report, which set out a roadmap for developing skills to reach the region's ambitious net zero goals, identified that achieving these goals represents a significant technical, funding and social challenge. In order to meet these goals, regional efforts will need to be underpinned by adequate provision of skills training and education, consumer information campaigns to stimulate demand and build consumer confidence, and public financing for retrofit measures for those people and organisations unable to pay up-front for installation of measures.

2.1.5 Following on from this report, SWNZH commissioned the Review of Able to Pay Loan Fund Proposition[6], conducting a high-level appraisal of the opportunity in the region, aimed at

[5] South west net zero hub retrofit skills report (swnetzerohub.org.uk)
[6] South West Net Zero Hub ('SWNZH') (neynetzerohub.com)

testing the validity of a joint public/private funded scheme and producing a number of follow-on recommendations for further work. The prospective scheme was intended to target the able to pay sector, which is key to the market penetration of energy efficiency and decarbonisation measures in the region, and a widely recognised policy gap in the retrofit sector. The report published illustrative findings and identified the need to continue the workstream, undertaking significant further work, including the need to complete detailed review of the potential fund strategic, economic, legal and management frameworks for the creation of a business case.

Introduction to the South West region

2.1.6 Following a competitive tender process, a consortium comprising Gemserv, Ltd, Amberside, Lux Nova and Browne Jacobson were invited to undertake further work: testing previous findings and developing a Business Case for the creation, delivery and management of an Able to Pay Retrofit Loan fund, to assist in the setup of an initial retrofit loan fund pilot.

2.1.7 The commission seeks to answer questions pertaining to:

- The full scale of the opportunity in the region;
- Establish suitable lending terms to attract a blend of public and private finance to the fund;
- Provide legal advice on the structuring of the fund, compliance with relevant regulatory frameworks and tax regulations.

2.1.8 In addition, the project is intended to consider an overall fund size of £100million (although note that the financial model developed as a key deliverable accompanying this business case has been built on a fully flexible basis and can be adapted to assess the financial implications of different Fund sizes) and engage with private sector actors.

2.1.9 A full list of unitary authorities, councils and LEPs that define the area covered by the proposed fund is provided in Table 11 - Geographic area proposed for loan fund.

2.2 Business Strategy and Overview

2.2.1 The UK government has set a legal target of reaching Net Zero by 2050[7], predominantly through decarbonisation of current activities. Buildings remain the second biggest emitter of carbon on a national scale, accounting for 17% of 2022 carbon emissions[8], and having experienced no substantive reduction in emissions since 2010, it is clear that reduction in carbon emissions for this sector has stalled.

2.2.2 The retrofit market in the UK is currently experiencing growth, propelled by a convergence of government-funded grant schemes and an increasing emphasis on energy efficiency among homeowners and landlords. There has been a notable shift in accommodating the 'able to pay' demographic. This group, comprising of homeowners with the financial capacity to

[7] The Climate Change Act 2008 (2050 Target Amendment) Order 2019 (legislation.gov.uk)
[8] Progress in reducing emissions: 2023 report to Parliament. Climate Change Committee

invest in energy efficiency but who may be constrained by knowledge gaps or accessibility issues, is becoming an increasingly central focus.

2.2.3 However, the Climate Change Committee (CCC) maintains that current efforts are not sufficient to ensure that buildings, and particularly domestic use of energy, reaches Net Zero by 2050. The CCC also notes requirements to resolve key gaps in policy concerning domestic heating, and accelerate penetration of low-carbon heating technologies and energy efficiency measures across all sectors of the domestic market. Particularly, the CCC notes that while the incentives for installing energy efficiency measures are well understood, the uptake of these measures in the owner-occupier and private rented sectors is still slow. Indeed, the CCC recognise that energy efficiency in the non-fuel-poor sector remains the most significant policy gap in the buildings sector (recommendation R2022-065), and additionally note that buildings are no more resilient to volatile energy prices now than before the crisis and pre-existing vulnerabilities that the crisis exposed remain. By contrast, other nations responded with significant investments in permanent measures to improve energy efficiency[9]. This progress report makes clear the requirements to accelerate the uptake in domestic energy efficiency measures and low-carbon heating technologies, and to address the key barriers that the owner-occupier and private-rented sectors face.

2.2.4 Reflecting the need for change, combined with the drivers and barriers for retrofit, the wider policy landscape is undergoing a substantial transformation to increase energy efficiency efforts, both across the able-to pay and not able-to-pay sector. This change is largely catalysed by the UK government's commitment to achieving net-zero emissions by 2050. An example of one change is that for owner occupied domestic properties, there is the introduction of a UK target for all homes meeting feasibility criteria to be EPC C by 2033[10]. It will also mean that mortgage lenders will be required to have an average of EPC C across their lending portfolio by 2030, which is likely to result in a widening in the cost of borrowing between energy efficient and non-energy efficient properties. Further to this, in March 2022, it was announced[11] that homeowners installing energy efficiency measures in their homes will no longer have to pay VAT on the materials they use, creating further fiscal incentive.

2.2.5 The Department for Energy Security and Net Zero (DESNZ) has commissioned research to understand the willingness of owner-occupiers to co-fund retrofit measures. This research highlighted the importance of government subsidies in encouraging homeowners to undertake retrofit projects, as higher subsidies have shown a positive correlation with increased uptake, particularly for more costly measures.

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[9] Sasse T and Hodgkin R (2022) *Tackling the UK's energy efficiency problem: What the Truss government should learn from other countries,*

[10] BNP Paribas. 2023. What's changing in MEES regulations in 2023? Available at: https://www.realestate.bnpparibas.co.uk/2023/may/whats-changing-mees-regulations-2023

[11] HM Revenue & Customs. 2022. Changes to the VAT treatment of the installation of Energy Saving Materials in in Great Britain. Available at: https://www.gov.uk/government/publications/changes-to-the-vat-treatment-of-the-installation-of-energy-saving-materials-in-in-great-britain

2.2.6 Published in January 2023 by E3G[12] on the spring budget for the UK government and the 'retrofit revolution' explores the opportunities for the spring budget to smooth the path for energy efficiency and heat pumps at scale. The report highlights that an additional £8.67billion for home decarbonisation is needed to meet the UK's carbon budget to reduce energy demand by 15% by 2030. It is suggested that support could be provided through concessional loans, tax incentives and stamp duty rebates. As government has prioritised the financially vulnerable market, the able to pay may require greater fiscal incentives. The Clean Growth Strategy[13], a-UK government policy document, emphasises the critical role of retrofitting in enhancing energy efficiency, particularly in existing homes. It advocates for upgrading housing stock to higher energy performance standards.

2.2.7 The future of UK retrofit policy appears to be moving towards a more comprehensive approach, with a focus on whole-house retrofits over individual energy-saving measures. There is a growing emphasis on stricter energy efficiency standards for buildings, particularly in the residential sector, which will drive demand for retrofitting services. Additionally, there is an increasing focus on expanding support for green finance options, including low-interest (and now zero interest) loans and incentives, to make retrofit projects more financially accessible. These trends reflect a concerted effort to not only enhance energy efficiency but also to encourage a holistic and sustainable approach to retrofitting in the UK.

2.2.8 Some recent investments and support include:

- Establishing the Energy Efficiency Taskforce - to support the reduction of the UK's final energy consumption from buildings and industry by 15% by 2030 against 2021 levels.
- The Boiler Upgrade Scheme - providing £450million between 2022-2025, and now extended to at least 2028. Supporting the expansion of the low carbon heat market, scaling up manufacturing and upskilling installers.
- The Public Sector Decarbonisation Scheme - providing £1.4billion as part of Phase 3 that provides grant funding over the financial years 2022-2025.
- The Green Home Finance Accelerator - up to £20million to support the development of innovative green finance products that help homeowners with upfront costs of energy improvements (expecting to fund up to 27 successful projects)
- Creation of the UK Infrastructure Bank - a UK government-owned policy bank with £22billion of financial capacity across its private and local authority lending arms. At the time of writing, 18 deals have been announced, investing over £1.81billion. Within their investment principles, it includes "finance the deployment of retrofit, energy efficiency and heat technologies".

[12] E3G. 2023. The spring budget and the retrofit revolution ending the warm homes postcode lottery. Available at: https://www.e3g.org/wp-content/uploads/The-spring-budget-and-the-retrofit-revolution_E3G-briefing.pdf

[13] BEIS. 2017. The Clean Growth Strategy. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/700496/clean-growth-strategy-correction-april-2018.pdf

2.2.9 Another prominent trend is the growing prominence of equity loans and alternative financing mechanisms for energy efficiency projects. Initiatives like the Home Energy Efficiency Equity Loan Pilot in Scotland[14] aim to offer homeowners a viable financial avenue to enhance energy efficiency. These loans hold the potential to bridge gaps for those who may not meet the criteria for standard loans or fuel poverty programmes, thereby promoting independent living and overall well-being. Likewise, widening the scope of those that are considered 'able to pay'.

2.2.10 Research from the New Economics Foundation[15] on whole house retrofit suggests that a widespread home energy 'retrofit' program is likely to be one of the most effective forms of green stimulus, having wider benefits for income inequality, public health and climate change. It argues for government backed investment into a 'whole house' approach to retrofit, which combines improvements, from fabric to ventilation to microgeneration, to optimise the performance of the building. In terms of financing whole house retrofit, supporting research[16] shows that a low cost of capital is key to the current economic viability of whole-house retrofits, and that that finance mechanisms alone are unlikely to be a driver of demand for whole-house retrofit, and so instead should be viewed as a necessary enabler of a much broader strategy.

2.2.11 Partnered with the Centre for Sustainable Energy, in 2021 Bristol City Council carried out research[17] to understand the motivations and needs of a group of Bristol Able to Pay (ATP) retrofit consumers that applied for a Bristol City Council Bright Green Homes scheme grant in March 2021. Commenting on creating a successful able-to-pay retrofit scheme, the report offers a series of recommendations, such as prioritising measures with shorter payback periods and lower upfront costs. Relating to the financing of retrofit, it suggests offering comprehensive information and assistance for planning retrofits, promoting collective bulk-buy schemes, and providing financial support through grants and loans. There is also a focus on local installers and supply chains and connecting homeowners with community energy groups.

2.2.12 The Rightmove Green Homes Report [18] highlights that a growing number of prospective homebuyers are actively seeking properties with green features. This demand has translated

[14] Scottish Government. 2022. Home Energy Efficiency Equity Loan pilot - call for evidence on potential national rollout: analysis of responses. Available at: https://www.gov.scot/publications/home-energy-efficiency-equity-loan-pilot-call-evidence-potential-national-rollout-analysis-responses/pages/2/

[15] New Economics Foundation. 2020. A green stimulus for housing the macroeconomic impacts of a UK whole house retrofit programme. Available at: https://neweconomics.org/uploads/files/Green-stimulus-for-housing_NEF.pdf

[16] CREDS. 2019. Worth the risk? An evaluation of alternative finance mechanisms for residential retrofit. Available at: https://www.creds.ac.uk/publications/worth-the-risk-an-evaluation-of-alternative-finance-mechanisms-for-residential-retrofit/

[17] Centre for Sustainable Energy. 2022. Bristol City Council Able to Pay Retrofit Research Final Report – Executive Summary. Available at: https://www.bristol.gov.uk/files/documents/5037-able-to-pay-retrofit-research-exec-summary/file

[18] Rightmove. 2022. Green homes report. Available at: https://www.rightmove.co.uk/news/content/uploads/2022/07/Rightmove-Green-Homes-Report.pdf

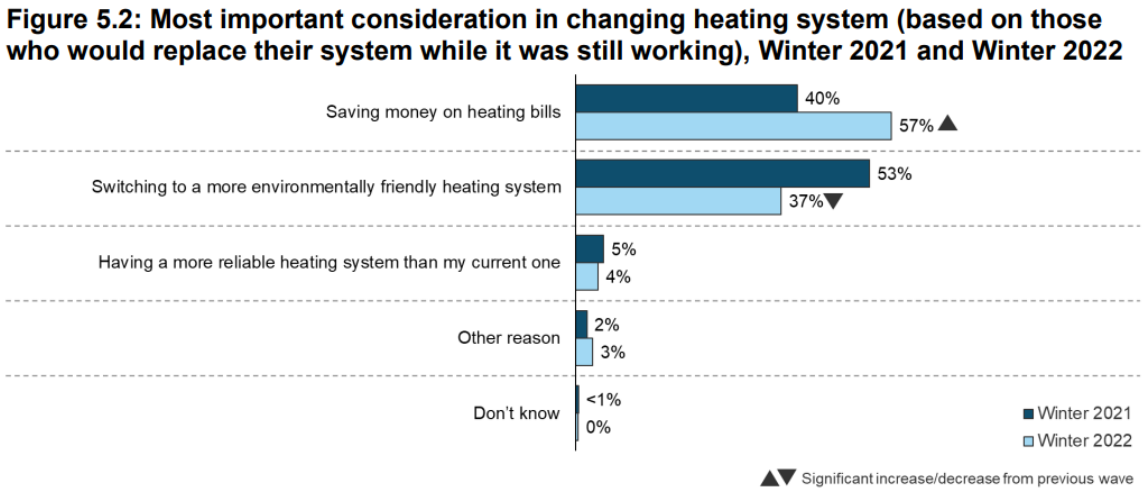
into tangible value in the market, with properties boasting higher Energy Performance Certificate (EPC) ratings consistently outperforming others. Notably, homes with an EPC rating of B have emerged as the quickest to sell. There is also a clear indication that homeowners are receptive to comprehensive retrofit plans that encompass multiple energy-saving measures. This surge in demand for energy-efficient homes signifies a shifting paradigm in consumer preferences, indicating a promising future for the retrofit market.

2.2.13 Affordability and initial costs remain pivotal concerns for homeowners contemplating retrofit measures. The inconvenience and disruption associated with specific retrofit projects pose significant considerations for homeowners. Additionally, there exists a clear need for greater public education on the carbon emissions impact of energy-efficient technologies. As the market landscape continues to evolve, it becomes imperative to address these barriers to ensure the widespread adoption of energy efficiency, decarbonisation and energy generation measures and realise the UK's ambitious climate targets.

Incentives for uptake of energy efficiency and low-carbon heating technologies

2.2.14 There are a range of different drivers for the installation of retrofit measures into domestic properties. These are summarised below, alongside "Figure 5.2" from DESNZ's Spring 2023 Public Attitudes Tracker[19], shown below as Figure 2. This figure shows that the two key drivers for installing retrofit measures, specifically a new heating system before the previous one has broken, is reduced energy bills and reduced household emissions. Interestingly, consumer attitudes have recently shifted to place more importance on cost savings than environmental benefits, which is likely to reflect the cost-of-living crisis and increased energy prices.

Figure 2 – Public Attitudes Tracker



2.2.15 **Reduced energy bills**: Many retrofit measures are shown to reduce energy bills for consumers, particularly with the installation of insulation whereby a property will have a

[19] DESNZ. 2023. DESNZ Public Attitudes Tracker: Heat and Energy in the Home Spring 2023,UK. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1164129/desnz-pat-spring-2023-heat-and-energy-in-the-home.pdf (pg.21)

reduced heating demand, thus reducing the amount of energy and money required for heating. Therefore, retrofit measures are attractive to many consumers to aid in reducing energy bills, particularly during the current cost-of-living crisis. Particularly for the able-to-pay sector, investing in retrofit measures is a worthwhile long-term action to assist with future financial stability.

2.2.16 **Becoming more environmentally friendly**: Many householders in the UK are aware of the national net zero by 2050 targets and want to play a part in achieving this to tackle climate change. Individuals are becoming more aware of their carbon footprints and household emissions, causing them to consider installing a low carbon heating system or energy efficiency measures. This is driven by an individual's desire to reduce their carbon emissions, but is influenced by education on the need to do so.

2.2.17 **More reliable heating systems**: Consumers are choosing to switch to low carbon heating systems due to their reliability. With heat pumps in mind, their average life expectancy is 20-25 years, which is 10-15 years longer when compared to a typical gas boiler[20]. Heat pumps are also the most efficient heating system with efficiencies up to 400%, but they are typically as, or more, expensive to run than a gas boiler when considering a like for like heat output. The extent of running cost difference will vary depending on quality of installation, system choice/size, usage, control, management etc, but is primarily due to current electricity and gas prices. Gas – currently at 7.51p per kWh, costs around quarter of electricity, currently 30.11p per kWh . For householders choosing to replace their current heating system, these considerations will need to be taken into account when choosing the technology type.

2.2.18 **Improved comfort & health**: Retrofitting properties to improve their heating systems and increase insulation levels is proven to have health benefits. Insulating homes specifically provides the following benefits that improve comfort and health:

- Improved air quality
- Improved temperature regulation
- Less humidity and damp
- Reduced noise pollution.

2.2.19 These co-benefits of retrofit will therefore help to reduce cold homes worsening or causing health problems such as bronchitis, asthma and mental health issues[21]. The value for money when installing retrofit measures increases when health benefits of warmer homes are factored in[22].

[20] Evergreen Energy. N.D. How long do heat pumps last? Available at: https://www.evergreenenergy.co.uk/heat-pump-guides/how-long-do-heat-pumps-last/#:~:text=Heat%20pumps%20are%20long%2Dlasting,years%20before%20they%20need%20replacing.
[21] NEA. N.D. What is fuel poverty? Available at: https://www.nea.org.uk/what-is-fuel-poverty/
[22] EEIG. 2017. Action Plan for a comprehensive Buildings Energy Infrastructure Programme. Available at: https://www.theeeig.co.uk/media/1026/fe-energy-efficiency-final-clean-250917.pdf

2.2.20 Awareness of green finance mechanisms. In the UK Green Finance Strategy released in March 2023[23], there is a focus on government and public levers to help sectors scale up. It states, 'Sectors and technologies moving towards commercial maturity must attract further investment to scale up capacity, remain cost and price competitive, and maintain resilient supply chains in the face of increasing global demand for inputs." The UK Government has committed to deploying grant funding as listed in Table 1 – Current UK domestic retrofit funds. This approach of using a mix of public and private funding is known as blended finance and aims to de-risk private sector investment by using public sector funding to address set-up costs and activities that don't generate immediate investment, as well as building supporting frameworks and markets. The UK Government has committed to investing over £6.6 billion towards improving energy efficiency and low carbon heating and investing a further £6 billion over 2025-2028.

Barriers to uptake of energy efficiency and low-carbon heating technologies.

2.2.21 Whilst there are multiple key drivers, such as cost and environmental savings, that can incentivise residents to invest in retrofit measures, there are also numerous barriers which can deter investment in retrofit measures. These range from the high upfront cost and long payback time of many retrofit measures to a lack of awareness and understanding about the benefits of retrofit. The key barriers to investment in retrofit measures are discussed in more detail below:

2.2.22 **High upfront cost and long payback time of retrofit measures**. Energy efficiency measures can have a high upfront cost. According to Energy Savings Trust, typical costs for solid wall insulation are: £11,000 for external wall insulation (EWI) and £7,500 for internal wall insulation (IWI). While these measures can deliver significant energy and cost savings (cutting annual energy bills by £710 for a typical detached house[24]), this still represents a long payback time on the upfront investment. This often leads to perceptions of energy efficiency measures as being too expensive and payback times being too long.[25] This is compounded by income considerations and intensity of measures. Those on lower incomes are less likely to be interested in solid wall insulation, floor insulation, and heat pumps[26]. Even when consumers do invest in retrofit measures, there tends to be a focus on low-cost

[23] UK Green Finance Strategy. Available at : https://assets.publishing.service.gov.uk/media/643583fb877741001368d815/mobilising-green-investment-2023-green-finance-strategy.pdf

[24] Energy Saving Trust. N.D. Solid wall insulation. Available at: Advice on insulating your solid walls - Energy Saving Trust

[25] Citizens Advice. 2016. Driving Installation of Energy Efficiency Measures: Customer Research Findings. Available at: Driving Installation of Energy Efficiency Measures- Customer Research Findings.pdf (citizensadvice.org.uk)

[26] Citizens Advice. 2023. Demand: Net Zero Tackling the barriers to increased homeowner demand for retrofit measures. Available at: https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/Demand_%20Net%20Zero.pdf

measures with short payback times ("quick wins") at the expense of a deeper, more effective retrofit.[27]

2.2.23 Focus groups, convened by Bristol City Council as part of their Able to Pay Retrofit Research, also cited the payback period for retrofit measures as a major concern. ATP homeowners did not feel comfortable using 'rainy day' funds to finance energy efficiency improvements, especially because mortgage lenders appear to place little value on property's energy efficiency.[28] Hence, for many ATP consumers, the longer-term benefits of retrofit measures do not justify their high upfront cost. The perception that the value of retrofit is lower than its cost makes it difficult to incentivise homeowners to invest in measures. As the housing market starts to change and places greater value on energy efficiency, this should become a less significant barrier.[29]

2.2.24 **Perceived hassle of installation of retrofit measures**. There is a perception that retrofit measures are 'too much hassle' to install. As with many home improvements, retrofit installations can cause disruption to residents. For example, IWI reduces the floor area of adjoining rooms. It may also necessitate redecoration, and the removal and re-fixing of internal fixtures.[30] While most measures do not cause the same level of disruption as IWI, many residents are nevertheless put off by the risk of disruption.

2.2.25 One way to mitigate the adverse effects of perceived disruption on consumers' willingness to invest is by targeting key trigger points for upgrade. Residents can minimise the disruption caused by the installation of retrofit measures by timing installs to coincide with key trigger points, such as: sale, change of tenancy, major renovations, etc. For instance, the costs and disruption incurred by installing underfloor insulation is substantially reduced if it is carried out at the same time as existing floor replacement.

2.2.26 **Lack of consumer awareness and understanding**. Many consumers have limited awareness and understanding of retrofit measures and their potential benefits. Customer research conducted by Citizens Advice found that few people have a clear understanding of what they could do to their home and what the benefit would be. Figure 3 – Homeowner knowledge of EPC rating Figure 3 – Homeowner knowledge of EPC rating shows that less than one third of homeowners know their EPC rating. [31] Many respondents surveyed thought

[27] EEIG. 2017. Action Plan for a comprehensive Buildings Energy Infrastructure Programme. Available at: https://www.theeeig.co.uk/media/1026/fe-energy-efficiency-final-clean-250917.pdf

[28] Centre for Sustainable Energy. 2022. Bristol City Council Able to Pay Retrofit Research Final Report – Executive Summary. Available at: https://www.bristol.gov.uk/files/documents/5037-able-to-pay-retrofit-research-exec-summary/file

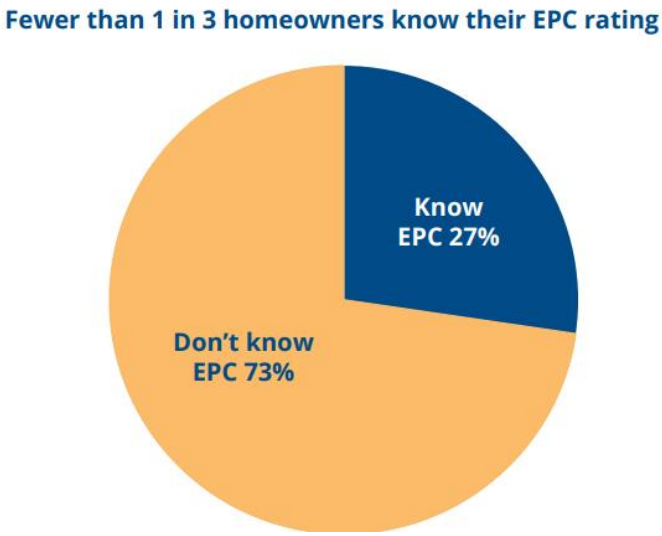
[29] Arup. 2013. Delivering and Funding Housing Retrofit: A Review of Community Models. Available at: https://www.arup.com/perspectives/publications/research/section/delivering-and-funding-housing-retrofit

[30] HomeLogic. 2021. Internal Insulation Problems. Available at: Internal Insulation Problems | Home Improvement (homelogic.co.uk)

[31] Citizens Advice. 2016. Driving Installation of Energy Efficiency Measures: Customer Research Findings. Available at: Driving Installation of Energy Efficiency Measures- Customer Research Findings.pdf (citizensadvice.org.uk)

that education, communication and a coherent narrative are equally as important as incentives.

Figure 3 – Homeowner knowledge of EPC rating



2.2.27 The Government has started to address this issue through targeted initiatives aimed at delivering energy advice to households. In August 2023, the DESNZ committed £20 million of funding to support 36 new pilot schemes offering expert energy advice directly to households.[32] Despite this, a lack of awareness and understanding remains a major barrier to investment in retrofit. This information and communications gap deters investment into energy efficiency not just from private homeowners, but also from private institutional investors. Deloitte's report on *Energy Efficiency in Europe* found that private investors are unsure of the benefits of energy efficiency and whether it will make a profitable investment.[33] Many feel that they lack sufficient information and understanding to make rational investment decisions in the sector. This leads to a perception among investors that energy efficiency investments are risky and complicated.[34]

2.2.28 **Lack of long-term policy certainty from government**. Setting long-term targets and regulations for the decarbonisation of homes creates the stability and certainty needed to encourage both homeowners and the market to invest in the energy efficiency sector.[35] Long-term policy certainty and long-term funding from government is vital both to build consumer demand in the ATP market and build up the retrofit supply chain. Setting the clear long-term regulatory framework for retrofit, through Minimum Energy Efficiency Standards

[32] DESNZ. 2023. Bespoke energy advice to help thousands of hard-to-reach households save on bills. Available at: Bespoke energy advice to help thousands of hard-to-reach households save on bills - GOV.UK (www.gov.uk)
[33] Deloitte. 2018. Energy Efficiency in Europe: The levers to deliver the potential. Available at: energy-efficiency-in-europe.pdf (deloitte.com)
[34] Economidou, M. and Bertoldi, P. 2014. Financing building energy renovations: current experiences and ways forward. Available at: https://publications.jrc.ec.europa.eu/repository/handle/JRC89892
[35] EEIG. 2017. Action Plan for a comprehensive Buildings Energy Infrastructure Programme. Available at: https://www.theeeig.co.uk/media/1026/fe-energy-efficiency-final-clean-250917.pdf

(MEES) for example, accompanied by long-term retrofit funding schemes, help to stimulate consumer demand and facilitate the large-scale uptake of low-carbon technologies.

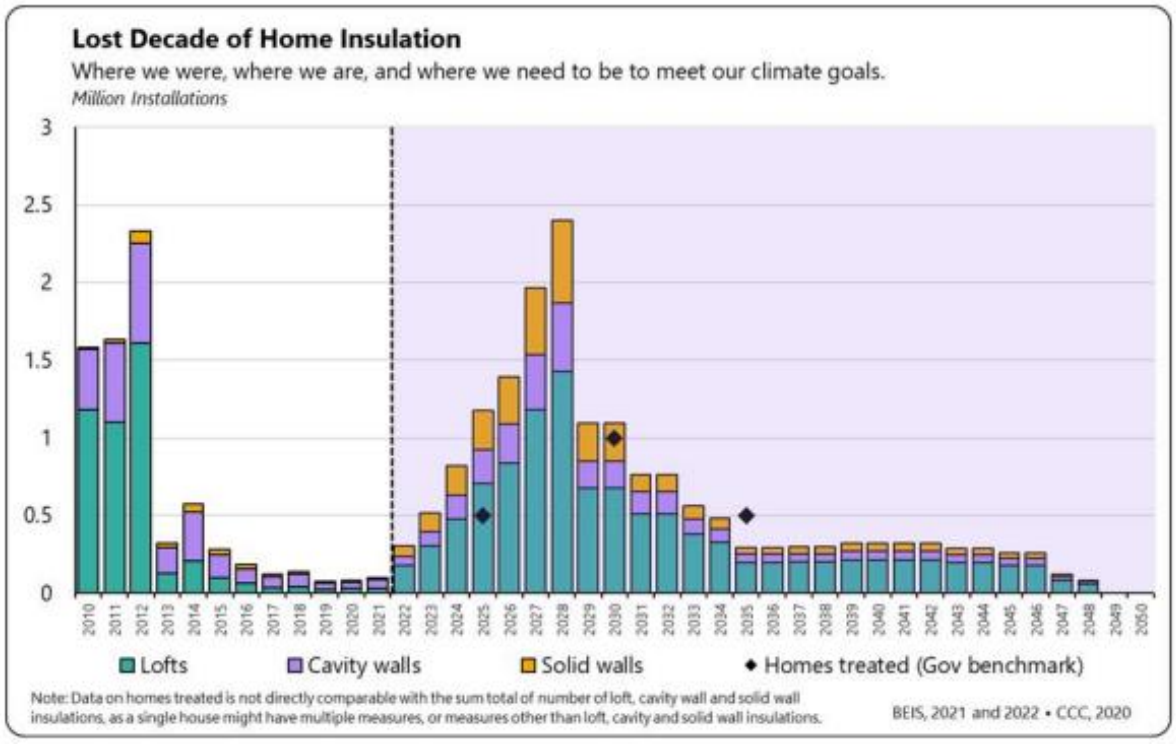
2.2.29 MEES in the private rented sector (PRS) are a key example of policy uncertainty from government holding back progress. In December 2020, the Government consulted on proposals to increase the MEES to EPC C by 2025 for new tenancies and by 2028 for existing tenancies.[36] However, nearly three years on, the Government has still not published its response to this consultation or signalled its intended policy direction in this area.

2.2.30 A lack of long-term policy certainty is a key obstacle to the growth of the supply chain, representing a barrier to the delivery of retrofit at scale across the UK. Without long-term policy and funding certainty, the retrofit supply chain does not have the confidence to invest in skills and training to grow the supply chain. This has hampered the supply chain in the past. When the Government cut subsidies and support for insulation in 2013, installation rates fell by around 90%, as highlighted by Figure 4, below.[37] This highlights the damaging effect that a lack of government policy certainty can have on the rate of home retrofits. Political back and forth over funding and support for retrofit has been one of the biggest barriers to sustained progress.

2.2.31 Retrofit businesses need long-term certainty to invest in training, recruitment, materials and innovation - all the ingredients necessary to grow the industry. If this long-term certainty and stability is not in place, then this investment will not happen, representing a huge supply-side barrier to retrofit.

[36] DESNZ/BEIS. 2020. Improving the energy performance of privately rented homes. Available at: Improving the energy performance of privately rented homes - GOV.UK (www.gov.uk)
[37] DESNZ. 2023. Mission Zero: Independent Review of Net Zero. Available at: MISSION ZERO - Independent Review of Net Zero (publishing.service.gov.uk)

Figure 4 – Lost Decade of Home Insulation



2.2.32 **Housing ownership structures** can be a significant barrier to the uptake and delivery of retrofit measures. This is particularly true in the rented sector, where housing tenure creates the issue of split incentives, whereby those who invest in energy efficiency measures do not always reap the benefits of improved energy efficiency like reduced energy bills and living in a warmer home.[38] Hence, there is limited incentive for the owner to undertake retrofit, particularly without proof that it will increase the value of the property.[39] Minimum energy efficiency standards (MEES) tackle this problem to a degree by setting regulations that compel landlords to upgrade their property's energy efficiency. However, as previously touched upon, a lack of policy clarity around MEES in the UK has reduced its effectiveness as a regulatory lever.

2.2.33 When it comes to the owner-occupied sector, leasehold properties prevent a serious challenge for retrofit. Leasehold structures can prove a major sticking point for energy efficiency improvements. In the South-West region, 15.3% of properties are owned on a leasehold basis.[40] This represents a significant minority of properties. The terms of a lease often prevent leasehold flat owners from making energy efficiency improvements within their property. Even where retrofit measures are possible, these are often only permitted at

[38] Economidou, M. and Bertoldi, P. 2014. Financing building energy renovations: current experiences and ways forward. Available at: https://publications.jrc.ec.europa.eu/repository/handle/JRC89892
[39] Arup. 2013. Delivering and Funding Housing Retrofit: A Review of Community Models. Available at: https://www.arup.com/perspectives/publications/research/section/delivering-and-funding-housing-retrofit
[40] DLUHC. 2023. Leasehold dwellings, 2021 to 2022. Available at: Leasehold dwellings, 2021 to 2022 - GOV.UK (www.gov.uk)

significant cost to the homeowner.[41] For instance, according to a survey by NAEA Propertymark, freeholders charged leaseholders £1,422 on average to install double glazing.[42] For many leaseholders, these obstacles and added cost make investing in retrofit measures a very complicated and often very costly process.

2.2.34 When it comes to green finance products, change of ownership can also present challenges around the transferability of obligations when the property changes hands. In the case of on-bill loans which attach the retrofit loan to the debtor, the homeowner often does not stay in the property long enough to see significant benefits from their investment, especially if this has a long payback time. On-bill tariffs attach the obligation to the property, so that repayments are transferred to the next owner when the property is sold. However, this can make the property less attractive to prospective buyers, hence making it difficult to sell. This was one of the problems with the Green Deal scheme in the UK, which was an example of an on-bill tariff scheme.[43] In the US, some mortgage lenders (e.g. Fannie Mae, Freddie Mac) even refuse to provide a mortgage to properties with the PACE loan attached.

2.2.35 **Retrofit supply chain**. As demonstrated by Gemserv's report for the SWNZH, the region has an underdeveloped supply chain. This is a limiting factor which could limit the delivery of retrofit at scale across the South-West region. The report's headline findings established that, "*The South-West faces severe labour shortages in key roles of heat pump engineers, heat pump electricians and solid wall insulation installers*. The report found that the current labour supply is insufficient to meet current and future demand for retrofit measures"[44] As such, the retrofit supply chain in the region must expand significantly to deliver the number of installs needed for net zero. Building supply chain capacity is also crucial to support an ATP homeowner loan fund such as the one proposed in this business case.

2.2.36 The quality of the supply chain is just as important as its quantity when it comes to encouraging ATP customers to invest in retrofit measures. Demand is dependent on the retrofit process providing 'good customer experiences and outcomes.'[45] Poor quality installs of the type that prompted the Each Home Counts Review can have damaging impacts on consumer confidence. Without an adequately skilled workforce working towards robust quality standards, it will be difficult to create sufficient consumer demand for an ATP homeowner loan fund.

2.2.37 Quality concerns also affect the willingness of financial institutions and private investors to enter the energy efficiency market. A call for evidence launched by the Department for

[41] Future Climate. 2017. Leasehold Reform. Available at: http://futureclimate.org.uk/home/leasehold-reform-campaign/
[42] Propertymark. 2018. Leasehold: A Life Sentence? Available at: https://www.propertymark.co.uk/resource/leasehold-a-life-sentence.html
[43] Economidou, M. and Bertoldi, P. 2014. Financing building energy renovations: current experiences and ways forward. Available at: https://publications.jrc.ec.europa.eu/repository/handle/JRC89892
[44] Gemserv. 2023. South West Net Zero Hub retrofit skills report. Available at: South west net zero hub retrofit skills report (gemserv.com)
[45] Energy Systems Catapult. 2023. Skills for an integrated and customer-focussed retrofit process. Available at: https://es.catapult.org.uk/report/skills-for-an-integrated-and-customer-focussed-retrofit-process/

Business, Energy and Industrial Strategy (now DESNZ) found that for key stakeholders, such as mortgage lenders to invest in energy efficiency, they need to have confidence that the installations they fund will be completed to a good standard. This is crucial to safeguard their own brand and reputation.[46]

2.2.38 The CMA's 2023 report on Consumer Protection in the Green Heating and Insulation Sector noted that, 'it can be difficult to find credible, trusted installer businesses.'47 If it is difficult for consumers to find a high-quality retrofit installer in their area, then this represents a substantial barrier to the success of an ATP homeowner loan fund. Therefore, the supply chain in the South-West requires significant expansion and upskilling to effectively facilitate an ATP homeowner loan fund.

Project Alignment to existing Policies

2.2.39 The development of this project for SWNZH is aimed specifically at reducing up-front financial burden for installing decarbonisation and energy efficiency measures for consumers, as well as increasing the overall rate and penetration of these measures into regional housing stock in a sector that has seen very little movement over the last 10 years.

2.2.40 The project also recognises the fact that public financing of measures through grants and other schemes cannot fill the finance gap required to incentivise uptake of the required measures. While some progress has been made to motivate private finance involvement in promoting energy efficiency in housing stock in publishing the consultation "Improving home energy performance through lenders[48] there has been no follow up to this consultation, or indication that this is sufficient motivation for private finance to participate. Additionally, while lending methods such as re-mortgaging or extending mortgages currently exist, they usually incur substantial set-up costs, and are subject to changing baseline interest rates, which serve to reduce consumer interest in doing so, despite the advantages set out above. Therefore, new methods of motivating private finance investment are required to initiate large scale, rapid deployment of decarbonisation and energy efficiency measures, and to create a compelling opportunity for consumer uptake.

Project support of business goals and strategic aims.

2.2.41 This project aims to propose and facilitate the set-up of a loan fund targeted at the able to pay sector, accelerating the uptake of energy efficiency and decarbonisation measures through providing accessible finance to consumers in a sector which is currently experiencing very little movement. This is in direct response to the findings of previous reports, and crucial in supporting progress to achieving the ambitious 2030 Net Zero goals

[46] BEIS. 2017. Building a market for energy efficiency: call for evidence. Available at: https://www.gov.uk/government/calls-for-evidence/building-a-market-for-energy-efficiency-call-for-evidence#:~:text=Call%20for%20evidence%20description&text=It%20invites%20views%20about%20the,by%20businesses%20and%20industry%20representatives.
[47] CMA. 2023. Consumer protection in the green heating and insulation sector. Available at: Consumer protection in the green heating and insulation sector (publishing.service.gov.uk)
[48] Improving home energy performance through lenders - GOV.UK (www.gov.uk)

declared in the Climate Emergencies announced by LAs. Gemserv's SWNZH Retrofit Skills report notes that this will be achievable, but challenging, and must be coincidental with an uplift in investment in skills and social outreach.

Relationship between project and other initiatives

2.2.42 While there is a clear policy gap for the owner-occupier sector, as reflected in the CCC progress report, the South West region is unique in the fact that there has already been significant effort towards addressing this gap, in the form of Lendology CIC[49], a not-for-profit social enterprise lender that works with homeowners to fund home repairs, improvements, adaptations and energy efficiency measures.

2.2.43 The Lendology CIC works in partnership with 20 councils across the region, providing homeowners with access to low-cost responsible financing, secured to the property via a title restriction, and based on bespoke financial due diligence that sits outside of traditional credit checks. The cost of the financial assessment and due diligence is currently funded by the LA partners, so that the only cost to consumer is that of the title restriction, usually around £20. Lendology is also disaggregated from the individual measures and their implementation: the homeowner retains the responsibility for commissioning any home energy assessment and the subsequent purchase of measures and their implementation. Currently Lendology invite individuals to obtain 2 quotes to ensure they are getting value for money, and once these have been obtained, the homeowner provides them to Lendology so that the Loan Agreement matches the value of the work being undertaken. Once the work has been completed, the invoice is shared with Lendology, and the funds are then released to either the homeowner or the Contractor, depending on the homeowner's specifications. This ensures that the money has been spent on the measures agreed.

2.2.44 The relative success of this platform creates an excellent environment for increasing the overall portfolio. However, the system relies on subsidy from LAs in the form of funding the financial due diligence and background checks, which would traditionally be in the remit of a fund manager.

2.2.45 There are, however, concerns around the scalability of the scheme if expanded to include wider private sector finance, as detailed in Table 3, below.

Table 3 – Lendology - example of an existing retrofit lending organisation

LENDOLOGY CIC	
Summary	Social enterprise lender operating in partnership with 20 councils across the South West, specialising in domestic energy efficiency and various other home-related loans
Advantages	**Low Loan Default Rate** A very low loan default rate at 0.3% (only c.£34k having defaulted out of c£11m portfolio **Sector Specific** Specialising in retail home energy efficiency projects, and geographically operating in South West
Potential Concerns	**Scalable?** The very low default rate is a result of their personable and individual-consultation based assessment as opposed to credit scoring or computer-algorithm based automated process. However, as WECA's fund needs a faster scale-up of retrofit and at a larger volume, we will need to see the evidence of scalability of their assessment process.

[49] Social-Impact-Report-2020-21.pdf (lendology.org.uk)

	Commercially Viable? Lendology's offerings such as the low interest rate (currently 4.2%), no early repayment fee, and the absence of credit check, could be challenging to maintain if private sector investors require commercially more viable terms, e.g. a higher rate, early repayment fee, or more stringent credit assessment. **Title Restriction and Financial Conduct Authority (FCA) Registration** Currently, Lendology is only eligible to offer consumer credit, and has not acquired a fund manager status from FCA. As such, they can only place a title restriction as a security for the loan. Lendology are currently changing their banking regulation status to enable the ability to take title restrictions.
Comments	Evidently, from their consultation with the project team, Lendology is aware that their own eligibility assessment process or the title restriction as the only form of security for the loan might be a barrier for facilitating private investment. On the scalability of credit assessment, we may still require Lendology to demonstrate how their current system can provide assessment at a large scale without using any credit scoring system.

2.2.46 Primarily, these concerns relate to the level of confidence that the current assessment criteria would provide to potential private-sector investors, and the demonstrable levels of return for a scalable solution to attract private investors. The model also relies on subsidy from individual partner LAs, which could place a large burden on those LAs were the scheme simply to be expanded.

2.2.47 These issues need to be addressed in the setup of a larger scale loan fund, particularly around the role and funding of a suitable fund manager, and the need for management of public subsidy at scale.

3 THE CASE FOR CHANGE

3.1 Spending / Fund Objectives

3.1.1 "The UK housing stock is responsible for approximately 20% of the country's total greenhouse gas emissions, and the challenge of decarbonising the built environment could result in a 40% shortfall to our economy-wide decarbonisation targets by 2030, unless it is addressed at pace".[50]

3.1.2 Energy efficiency measures and other building retrofit works are among the most cost-effective ways to reduce emissions and energy consumption, with many co-benefits including improved living standards, healthier and more resilient communities, and the delivery of new, skilled green jobs in every part of the country. Focussing on buildings will therefore help the UK deliver on its climate targets, support a green and inclusive recovery, and generate innovative green finance opportunities.

3.1.3 With over 25 million privately owned homes across the UK, and the average cost of "retrofitting" a traditional UK property being between £40,000 - £60,000, many homeowners find the idea of reducing their emissions and saving energy appealing, but the funding of those measures poses a significant challenge. Measures, support, and incentives are being put in place nationally to mitigate carbon emissions for new builds, council housing and housing associations' stock, and each of these areas bring the benefits of scale to showcase the value of making the changes.

3.1.4 The challenge for homeowners in financing these projects (to retrofit their properties) is widely recognised and accepted as a significant barrier in the pursuance of many LAs decarbonization goals.[51] The role of the financial system is increasingly recognised as essential in facilitating those solutions, while also helping to create a more inclusive and sustainable global economy.

3.1.5 There is a lack of financial support available for residential owner-occupiers considering retrofit works to their property. This is compounded by the lack of appropriate policy frameworks such as UK government funding, to finance retrofit upgrades. For example, the grants which are currently available for specific technologies are currently limited to boiler upgrades which would continue in parallel and may be an enabler for this scheme. An Able to Pay Loan Fund should be designed to accelerate uptake of energy efficiency measures, low carbon heating and renewable energy generation technologies in the sector, ideally mutually reinforcing existing retrofit financial support, for instance by offering an affordable monthly payment option to homeowners keen to invest in low carbon heating but unable to raise the necessary capital (even with the BUS). Whilst the illustrative packages of measure applied for financial modelling purposes are not a prediction of what technologies borrowers (who would not be restricted to specific 'packages') would seek to finance through the Able to Pay Loan Fund, the scope for the Fund to realise that potential enabling

[50] GFI, 2020. Available at: REPORT (greenfinanceinstitute.com)
[51] South West Net Zero Hub, Able to Pay Fund ITT, 2023.

role in relation to BUS is clearly considerable, given the identified regional opportunity of >500,000 possible Heat Pump installations (Figure 6).

3.1.6 The overarching purpose of the Pilot Loan Fund is to measurably demonstrate the financial and practical viability of a loan fund to deliver the required outcomes.

3.1.7 To successfully demonstrate this the **Strategic Objectives** of the Pilot Loan Fund have been agreed as follows:

- ✓ To ***accelerate the uptake of Permitted Energy Technologies*** in domestic properties in Target Local Authorities.
- ✓ To ***enhance the supply chain*** within this sector by:
  - ➢ Supporting the accelerated growth of the low and zero carbon contractor / skills base operating within Target Local Authorities; and
  - ➢ Supporting growth and capacity within the financial sector able to manage and administer large scale able to pay funds in this sector.

3.1.8 The measurable **Strategic Outcomes** resulting from successful application of the loan are agreed as:

- ✓ A quicker transition to a low / zero carbon residential sector, reducing emissions from that sector by approximately 500 thousand tonnes CO_2e by 2050
- ✓ More affordable energy costs for households (subject to measures installed).
- ✓ Higher levels of job creation and retention in this sector.
- ✓ Reputational benefits - with those stakeholders supporting delivery shown to be forward thinking, proactive and driven to implement practical solutions that will address climate change.
- ✓ A reduction in the pressures on the Grid (supporting transition to a flexible supply network).

3.1.9 In addition to the overall lifetime carbon figures, the following metrics have been estimated (figures shown in brackets), and can be tracked and updated alongside practical implementation of the future Pilot Loan Fund:

- ✓ the carbon savings per £ invested (16 $kgCO_2$/£).
- ✓ average carbon savings per household (2740 $kgCO_2$/household).
- ✓ number of households supported with a loan (9,250 households modelled).
- ✓ the % increase in households installing measures as a result of the fund being in place versus a scenario where no affordable finance was offered (to be determined during fund operation).

3.2 Existing Arrangements

3.2.1 The UK's ATP retrofit market is funded in two primary ways. First is through the public sector, usually in the form of low interest loans and grants. Second is through the private sector. Commercial banks are entering the space with green home loans, including green mortgages[52]. However, there is no readily available example of public/private blended fund that is offered to the ATP market whereas, in other countries, such examples can be found (e.g. PACE in the US)[53].

3.2.2 This section provides an overview of current schemes focused on retrofitting homes across the UK. The dominant method for funding is public-sector funded grants and competitions. Most national schemes have a primary objective of addressing fuel poverty (such as the Energy Company Obligation) or improving socially rented housing, making penetration into the able to pay sector difficult. A brief summary of several of these schemes and their objectives is provided in Table 4 - Retrofit and Energy Efficiency funding:

Table 4 - Retrofit and Energy Efficiency funding

Fund name	Fund Value	Income Restrictions?	Description
Great British Insulation Scheme (Energy Company Obligation – ECO)	£1 billion	Restrictions based on EPC and Council Tax Band	Drive uptake of energy efficiency measures among low income and vulnerable households in, or at risk of, fuel poverty.
Heat Pump Investment Accelerator Competition	£30 million	N/A	Drive investment in domestic manufacturing of heat pumps.
Home upgrade grant (HUG) Phase 1	£218 million	Yes	For low-income households with homes that are off the gas grid through the HUG scheme
Home upgrade grant (HUG) Phase 2	£630 million	Yes	Funding for local authorities to improve the energy performance and heating systems of off gas grid homes in England.
Local authority delivery grant (LAD) Phase 1	£500 million	Yes	The LAD scheme aims to raise the energy efficiency of low income and low energy performance homes with a focus on energy performance certificate (EPC) ratings of E, F or G.
Local Authority Delivery grant (LAD) Phase 2	£300 million	Yes	Funding for Local Net Zero Hubs to deliver energy efficiency upgrades in low-income homes.
Green Homes Grant	£256 million	No (now closed)	Offered homeowners the opportunity to apply for up to funding to install energy efficiency improvements and low carbon heat measures in their homes.
Getting Building Fund	£900 million	N/A	Deliver jobs, skills and infrastructure across the country relating to the built environment.
Boiler Upgrade Scheme	£450 million	No (in operation)	Incentivise the uptake of heat pumps by offering a grant to homeowners considering installation.

[52] Current offerings on Green Mortgages: Green mortgages (moneysavingexpert.com)
[53] Property Assessed Clean Energy Programs | Department of Energy

3.2.3 A full appraisal of the funding and support schemes can be found in Appendix 1.

3.2.4 Most notably for the able to pay sector, the **Great British Insulation Scheme (GBIS)** is a new national energy efficiency scheme, which will run alongside and complement the existing Energy Company Obligation 4 (ECO4) scheme for a funding total of £1 billion. The scheme is based on the same framework as the ECO4 scheme, with energy suppliers being responsible for administering and funding the scheme. However, unlike the ECO4 scheme, it will target a wider group of 'able to pay' households - up to 80% of households targeted by the scheme fall outside of the fuel poverty classification. As with existing UK retrofit schemes, such as ECO4, GBIS is a subsidy-based scheme, whereby residents are offered heavily subsidised energy efficiency measures. The Government expects some level of consumer contribution by 'able to pay' households, with its pre-implementation modelling predicting an average consumer contribution of 10%[54].

3.2.5 It is very early in the implementation of the GBIS scheme, therefore, it is not possible to make a judgement on the scheme's effectiveness at stimulating uptake of energy efficiency measures in the able to pay sector. However, the scheme's design is not particularly ambitious in either the number of retrofit measures it aims to deliver or the depth of retrofit it seeks to support. GBIS is primarily a single-measure scheme which will focus on delivering low-cost retrofit measures, such as cavity wall and loft insulation. The scheme aims to provide £1 billion of funding for 300,000 households to install energy efficiency measures.

3.2.6 Several initiatives in the UK are exploring and supporting retrofit for the able-to-pay market, including within the West of England. On a national scale, the **Home Upgrade Grant (HUG)**, offered by the Government, plays a crucial role in the 'able to pay' retrofit market. It facilitates homeowners who have the financial capacity to invest in energy efficiency measures but may require support to offset the upfront costs. Many local authorities and LEPs in the West of England have already utilised this scheme to accelerate home upgrades for the region, such as Plymouth City Council who launched the Future Fit Programme. The Bright Green Homes grant also has supported retrofit measures, with Bristol City Leap, an innovative partnership between Bristol City Council and Ameresco, receiving £11million of funding to energy efficiency upgrades for over 500 households in Bristol, North Somerset and Bath, and North East Somerset (BANES).

3.2.7 Other schemes, often at localised level have different objectives, including the dissemination of information and coordination of advice. One example is the Futureproof Network, in collaboration with the West of England Combined Authority (WECA, or the Combined Authority), which addresses the specific needs of homeowners who may have the means to invest in retrofit measures. By offering tailored advice and connecting homeowners with trusted contractors, Futureproof Network facilitates the process, making it more accessible and manageable.

[54] DESNZ. 2023. Design of the Energy Company Obligation (ECO): 2023-2026. Available at: Design of the Energy Company Obligation (ECO): 2023-2026 - GOV.UK (www.gov.uk)

3.2.8 There are also UK retrofit or energy efficiency funds that target developers and businesses (rather than the domestic market) and these offer more insights: London Green Fund (LGF) and the Mayor of London Energy Efficiency Fund (MEEF) but these are local, and specific to London.

3.3 Business Needs – Current and Future

The energy efficiency gap

3.3.1 The current policy landscape is insufficient to meet the challenge of decarbonising the building stock in the UK. As we have set out, the current focus of UK retrofit policy is focussed on the social sector and the fuel poor. However, 64 per cent of the UK's housing stock is owner occupier. [55]This is nearly 15 million households in the UK which lack dedicated funding and financial support to retrofit their homes. Most of these households are ineligible for support either because they are owner occupied, or because they are not fuel poor.

3.3.2 In the context of national 2050 decarbonisation targets, there is a clear need to accelerate retrofit and decarbonisation in the able to pay sector. The CCC recognises this as the biggest policy gap nationally, and it also recognises that current incentives and policies for improving the uptake of these measures are not proving sufficient.[56] Emissions from buildings remain the second highest contributing sector nationally.

3.3.3 This lack of policy support stands in clear contrast to the scale of the challenge. The South West region requires installation of over 2.5 million air source heat pumps and 485,000 ground source heat pumps to reach net zero.57 In terms of insulation, the South West requires 1.4 million installations of solid and cavity wall insulation to meet net zero.

3.3.4 This discrepancy between the cost-efficient level of retrofit deployment, and the level of deployment seen in practice is known as "the energy efficiency gap". The purpose of this business case is to demonstrate that an able-to-pay loan is a necessary part of the policy mix to address the energy efficiency gap and deliver the benefits associated with closing it.

3.3.5 Many of these measures will deliver greater savings for households than initial capital outlay, but the market suffers from low levels of consumer demand.

3.3.6 In addition, energy efficiency and retrofit measures (e.g. insulation, solar PV and heat pump deployment) are typically the lowest cost route to decarbonisation of the built environment, and supporting their installation helps correct for negative externalities associated with greenhouse gas emissions. Government intervention is therefore needed to both correct for the energy efficiency gap and the market's under deployment of technologies to deliver decarbonisation.

[55] Statista. Available here https://www.statista.com/statistics/286503/england-propportion-of-owner-occupied-households/
[56] Climate Change Committee. Recommendation 2022-10. Available at https://www.theccc.org.uk/publication/2023-progress-report-to-parliament/#key-messages
[57] https://www.swnetzerohub.org.uk/document/south-west-net-zero-hub-retrofit-skills-report/

The challenge for the South West

3.3.7 The energy efficiency gap and the need to accelerate the installation of energy efficiency and decarbonisation measures is even more urgent in the South West, given the advanced ambition to meet Net Zero by 2030 in many places. The South West Net Zero Hub Retrofit Skills Report (April 2023)[58] states that:

> "…at current deployment rates for each measure it would take the following amount of time to meet net zero:
>
> - "It would take nearly 600 years to deploy enough sold wall insulation measures.
> - "It would take 132 years to deploy sufficient loft insulation and 166 years to deploy sufficient cavity wall insulation to meet net zero.
> - "It would take 200 years to install enough air source heat pumps (ASHPs) and 278 years to install sufficient ground source heat pumps (GSHPs) to meet net zero."

3.3.8 While the geographical scope of that report differs from the requirement for this business case, the report does cover the geography of this business case and finds a shortfall in all areas of the South West. The numbers in all areas indicate the need to accelerate installation of retrofit measures significantly to decarbonise. Full investigations into the size of the market opportunity are conducted in section 3.4.34 - Establishing the Market potential.

3.3.9 The implication of the fact that the South West will miss its installation targets is that the current policy frameworks set out in the previous business case are insufficient, both to meet the current and future needs to deliver the measures. This is a result of the fact that funding and support for retrofit measures are targeted at the social housing and fuel poverty segments of the housing/property market.

3.3.10 Another implication of the shortfall in installation rates of retrofit measures is that the retrofit supply chain is insufficient to meet both current and future anticipated demand for retrofit measures. The South West Net Zero Hub Retrofit Skills Report identified a lack of demand for retrofit measures in the region as a principal reason for this shortfall in skills.

3.3.11 Gemserv's 2023 report on retrofit skills argues that the South West will require the following number of job roles to decarbonise its housing stock by 2050:

- 290 additional cavity wall insulation installers by 2035
- 4700 solid wall insulation installers by 2036;
- 86 additional retrofit assessors and 35 additional retrofit coordinators are required by 2037;
- 10,720 heat pump installers by 2037.

3.3.12 Without scaling up the retrofit workforce, the South West will be trapped in the energy efficiency gap. We propose that the able to pay retrofit loan fund will be a partial solution to

[58] Gemserv, April 2023. Available here: South west net zero hub retrofit skills report (gemserv.com)

this issue, in part by unlocking demand for retrofit measures, growing the workforce to meet the demand and driving uptake of retrofit measures in a previously underserved market.

3.4 Potential Scope and Service Requirements

Defining target audience

3.4.1 This business case has been tasked with aiming to set up a loan fund for able to pay consumers. The term "able to pay" is, however, subjective, and difficult to precisely define, despite the simplicity of the concept making it a common term in establishing high level audiences for schemes. In simple terms, a definition has been developed for the purposes of this business case:

> ***Homeowners who, either independently, or with the support of an affordable financing mechanism, are financially able and willing to install Permitted Energy Technologies.***

3.4.2 We have considered three factors below (Ability to Pay; Homeowner; Demand for retrofit) in determining the target audience for this potential pilot scheme, each of which will be discussed in the sections below.

Ability to Pay

3.4.3 Following the above working definition of able to pay, finance is therefore to be provided based on the ability of homeowners to both afford repayments, and willingness to make those repayments. Defining 'ability to pay' is critical to several key fund objectives. One objective is ensuring homeowner interest. The success of the pilot will depend on homeowner interest, requiring a competitive loan offering, maximising the chance of successful implementation by encouraging uptake of loans.

3.4.4 We also considered investor interest when determining our definition of able to pay. This is critical to the size of the fund and availability of investment. Ensuring low default rates and high return on investment will be critical to attracting investor interest necessitating consideration of the consumer's ability to repay a typical loan package.

3.4.5 The last consideration is the size of the market. The more tightly we define the ability to repay a loan, the smaller the eligible cohort for the loan fund. As such, there will be no upper cap on household income in determining eligibility within the Pilot phase. There will be lower limits on household income to ensure affordability and investor confidence.

3.4.6 Further investigations as to practical limits of income for this fund are conducted under section 3.4.23.

Homeowners

3.4.7 The fund will be available to owner occupiers. Put simply, this means people that own their homes and live in them.

3.4.8 The fund is not intended to be used by tenants, who are rarely, if ever, responsible for the structure of the building or replacement of heating and energy infrastructure within the property. There is therefore a clear requirement for the customer to be a homeowner, either owning the property outright, or as the legal title owner with a loan secured against the property.

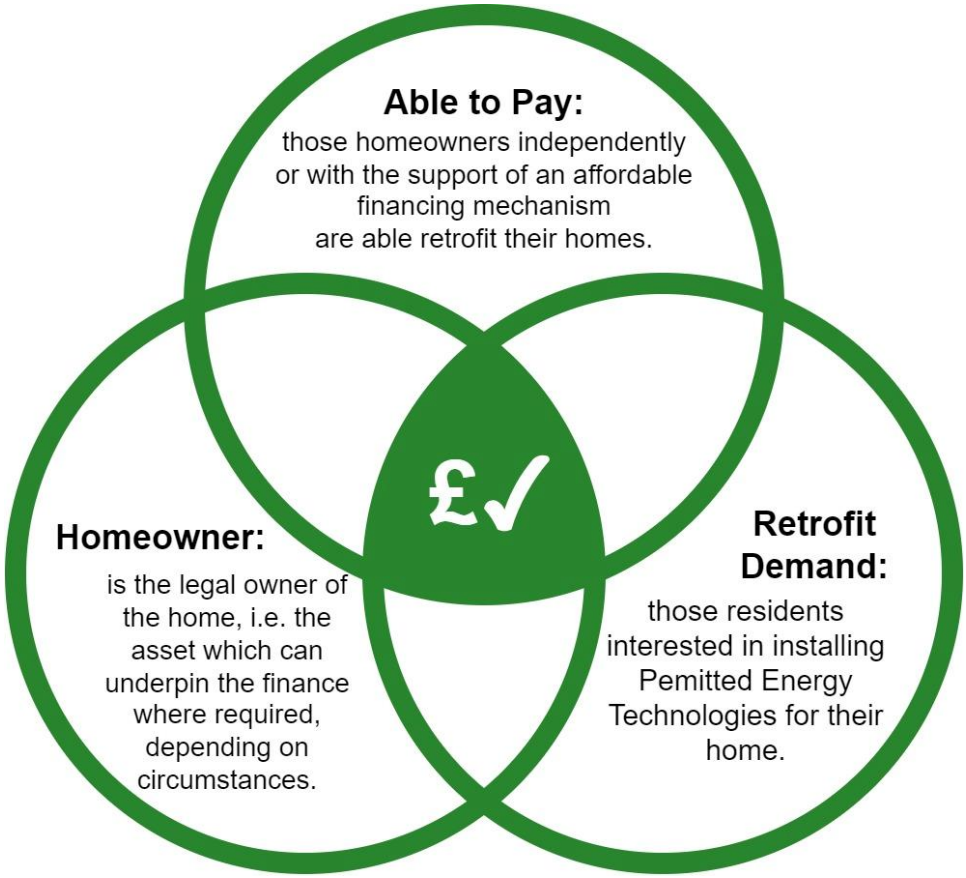
3.4.9 During the initial pilot it is not intended that, loans will be available to residential landlords (of any scale). Beneficiaries must own their home, occupy that property as their primary residence, and be undertaking works to it.

Demand for Retrofit

3.4.10 The final characteristic of the target audience is that there must be demand from the householder to install Permitted Energy Technologies. This is likely to be the result of drivers including anticipated energy cost reduction (albeit at no point can the fund promote itself as a means of saving money c.f. MCS Heat Pump rules and FCA permissions) and reduction of household environmental impact via lower emissions. In practice the pilot fund is likely to be of most interest to the Early Adopter proportion of the population, but also, potentially, those households in distress purchase situations needing rapid access to finance to facilitate retrofit upgrades quickly.

3.4.11 The final intended target audience for this loan fund can be characterised by eligibility in each of these three categories, as pictured in Figure 5 below.

Figure 5 - Determining the target audience



Permitted Energy Technologies

3.4.12 The loan fund will cover the costs of installing Permitted Energy Technologies (PETs) - those solutions which are permitted to be financed under the terms of the loan fund and which, when installed, will contribute to meeting the strategic outcomes of the scheme.

3.4.13 PETs will be split into two categories: Primary and Secondary (see Table 5, below). The overall cost of Secondary Measures is typically lower than Primary Measures and therefore they are less likely to need finance when installed individually. If a Secondary Measure was to be loan financed individually, the cost of administering the loan would be disproportionately high. Moreover, there is a significant risk of the loan being used by householders for measures that do not achieve the required fund outcomes. This would particularly be the case with double glazing replacement, for example. Whilst a more costly measure, the impact of glazing on emissions is far lower per £ invested. So, whilst permitting 'glazing only' may deliver a financial return to those providing capital to the fund, that measure would not typically deliver meaningful emissions savings.

3.4.14 For these reasons, Secondary Measures are included in the mix only where at least one Primary Measure is included, providing a level of control in how the funds are spent to achieve the strategic objectives and outcomes, whilst being sufficiently flexible in meeting householder needs.

Table 5 - Categorisation of Permitted Energy Technologies

PRIMARY MEASURES	SECONDARY MEASURES
Air Source Heat Pumps	Cavity wall insulation
Ground Source Heat Pumps	Party wall insulation
Solar Photovoltaics	Standard Loft insulation (at joist)
Domestic energy storage/batteries (where PV is also a measure)	Energy efficient fixed lighting
Solar Thermal panel systems	Heating system controls / home energy management systems
Biomass boilers – wood pellet or wood chip only	Room in roof insulation
Solid Wall insulation (Internal and External with required associated ventilation)	Tank Insulation
Hard to treat cavity wall (EWI assumed for modelling)	Draught-proofing
Flat roof insulation (where this is the majority of roof space)	Double/Triple glazing
Domestic scale hydroelectric turbines	
Any combination of at least THREE Secondary Measures that meet the value thresholds for the loan	

3.4.15 The cost of any building repairs needed specifically to enable a Permitted Energy Technology can be included in the loan value, helping to remove further barriers to take up across the region.

3.4.16 The preliminary work completed by Via Analytics showed that, ideally, the minimum loan amount should be in the region of £12,000-15,000. We consider that this amount is the minimum that is sufficient to cover the range of measures set out as PETs, although – allowing for current funding available through the Boiler Upgrade Scheme – we have reduced the minimum loan amount to £7,500 in the modelling. These values also initially reflect the intention for the loan to facilitate retrofit of more than one measure, and that primary measures (as categorised in Table 5, above) tend to be more expensive to fit, have potentially greater impacts for emission reductions, and work best when combined with a number of secondary measures which typically increase the cost of installation.

3.4.17 However, the choice of minimum loan value will need to be kept under constant review, and seek to reflect the wider availability of grants, technology price changes, and the cost of administration. The list of PETs largely reflects funded technologies under existing government grant programmes (including Boiler Upgrade Scheme, Sustainable Warmth programme and Home Upgrade Grant, etc). Again, this will need to be kept under review to reflect technology availability, new technologies and government policy/support.

Excluded Energy Technologies

3.4.18 The following technologies/solutions are to be ***explicitly excluded*** from the financing via the loan fund as they do not align with the desired strategic objectives and outcomes:

- Any measures which use fossil fuels (e.g. gas boiler replacement, first-time gas central heating systems, gas CHP, and hybrid gas/electric heat pumps, oil boilers, LPG boilers, etc);
- Wood / log burning stoves;
- Standalone ventilation systems - where ventilation measures are needed to accommodate e.g. EWI, then this work should be incorporated into the cost of that measure;
- Temporary heating solutions;
- Repairs of heating systems and other existing measures/technologies;
- Roof mounted wind turbines;
- High-capacity electric storage heaters;
- Infrared heating panels.

General Installation Standards

3.4.19 Quality of installation remains paramount to reduce both reputational risk to the fund and to stakeholders, and to minimise risk of loan default (savings, where specified, failed to materialise). To this end it is proposed that installers of measures will comply with the

following standards and certification. Table 6 - Required Industry accreditations by measure shows the installation company's required accreditation, where:

A = Trustmark Registered & PAS2030(2019) certified installer

B = Installation to PAS2035(2019) standard

C = MCS Certified installer with relevant consumer code membership (RECC or HIES)

D = MCS Certified products only

Table 6 - Required Industry accreditations by measure

MEASURE	STANDARD
PRIMARY MEASURES	
Air source heat pumps	C & D
Ground source heat pumps	C & D
Solar PV	C & D
Domestic energy storage / batteries	C
Solar thermal panel systems	C & D
Biomass boilers – wood pellet or wood chip only	C & D
Solid wall insulation (both external and internal)	A & B
Hard to treat cavity wall Insulation (EWI assumed)	A & B
Flat roof insulation	A & B
Domestic scale hydroelectric turbines	C & D
SECONDARY MEASURES	
Cavity wall insulation	A & B
Party wall insulation	A & B
Standard loft insulation (at joist)	A & B
Energy efficient fixed lighting	Known certification body e.g. NAPIT/NICEIC etc.
Heating system controls /Home Energy Management Systems	See relevant heating system
Room in roof Insulation	A & B
Tank insulation	A & B
Draughtproofing	A & B
Double/triple glazing	FENSA or Trustmark Approved

3.4.20 The requirement to use PAS2030/2035 standards of installation for certain measures will precipitate the need to engage Retrofit Assessors and Co-ordinators. The additional cost of doing so – several hundred pounds per property – will need to be met by the householder, either self-funded or retrospectively using the loan once agreed, added to the cost of measures proposed. This arguably only becomes viable for the householder when considering a range of measures on a whole house basis, rather than simple, individual measures, and therefore aligns with the Primary/Secondary approach above.

3.4.21 Where only (for example) PV and an air source heat pump is sought by the homeowner, PAS2030/2035 is not relevant. It is best practice generally to ensure that an MCS Certified

installer should make appropriate recommendations to the homeowner where such works (i.e. insulation) are required prior to installation. At that point, the homeowner would be free to accept those recommendations and appoint those works accordingly.

3.4.22 We recommend that the fund's website should refer to reputable sources of external advice such as the MCS and TrustMark websites. However, the liability for the quality of the measures installed remains with the installation company and manufacturer of the measures, as appropriate, and there are no guarantees to be provided by the loan fund as to their performance or effectiveness. The terms and conditions of the loan would need to clearly state this restriction of liability.

Minimum loan level and affordability

3.4.23 We recommend that the minimum loan amount should be £7.5k per loan. We consider that this amount is sufficient to cover the range of measures set out as PETs in conjunction with currently available grant funding, the most prominent being the Boiler Upgrade Scheme. A set of affordability testing has been undertaken to establish the likely income levels needed to enable repayment of this loan amount without undue pressure on householder budgets.

3.4.24 For the purposes of this exercise, we have determined that the loan repayment should not exceed more than 20% of residual incomes. This is in the context of ensuring that householders falling into the pilot, and eligible for access to the fund, present minimal repayment risk to the fund and that the risk of default for the borrower is minimised.

3.4.25 The following tables demonstrate the outcome of the affordability testing, across three different potential loan values (£7,500, £12,000 and £15,000). The interest rate is assumed to be 6.1%, with a ten-year term.

Table 7 - £7,500 loan initial affordability assessment.

£7,500 loan, £89 monthly repayment, figures in £									
Household income (gross)	Effective tax rate*	Net	Average mortgage % of income**	Average utility costs pa ***	Residual net income	Monthly equivalent	Other monthly spend****	Residual	Loan repayment as a % of 'residual' income
100,000	0.276	72,400	0.3	2,775	47,905	3,992	1,500	2,492	4%
90,000	0.26	66,600	0.3	2,775	43,845	3,654	1,500	2,154	4%
80,000	0.245	60,400	0.3	2,775	39,505	3,292	1,500	1,792	5%
70,000	0.22	54,600	0.3	2,074	36,146	3,012	1,500	1,512	6%
60,000	0.19	48,600	0.3	2,074	31,946	2,662	1,500	1,162	8%
50,000	0.15	42,500	0.3	2,074	27,676	2,306	1,500	806	11%
40,000	0.14	34,400	0.3	1,442	22,638	1,887	1,250	637	14%
30,000	0.12	26,400	0.3	1,442	17,038	1,420	1,000	420	21%
20,000	0.08	18,400	0.3	1,442	11,438	953	750	203	44%

3.4.26 Households with gross incomes of more than £40,000 can secure access to loans of £7,500. This would firstly fit within the affordability test of the loan costing less than 20% of residual income in loan repayments. This smaller value could be used to supplement the value of grant funding such as the BUS (£7,500) to reach the minimum investment of £15,000 in measures.

3.4.27 This may be appropriate in the case of households needing single measures like heat pumps where, the BUS grant may cover most of the cost of the measure but not all of it. Allowing a lower loan value could allow these households to conduct 'secondary' works such as upgrades to radiators, insulation, windows and doors that are necessary to install a heat pump in their property but are not covered by the £7,500 from the BUS. This would widen the potential market while maintaining affordability of the loan. See - £7,500 loan initial affordability assessment.

3.4.28 Our analysis indicates that for a typical loan value of £12,000 to ensure the loan repayment does not exceed a 20% of residual income, then able to pay households will require a gross income of at least £50,000 income.

Table 8 – £12,000 loan initial affordability assessment.

£12,000 loan, £142 monthly repayment, figures in £									
Household income (gross)	Effective tax rate*	Net	Average mortgage % of income**	Average utility costs pa ***	Residual net income	Monthly equivalent	Other monthly spend****	Residual	Loan repayment as a % of 'residual' income
100,000	0.276	72,400	0.3	2,775	47,905	3,992	1,500	2,492	6%
90,000	0.26	66,600	0.3	2,775	43,845	3,654	1,500	2,154	7%
80,000	0.245	60,400	0.3	2,775	39,505	3,292	1,500	1,792	8%
70,000	0.22	54,600	0.3	2,074	36,146	3,012	1,500	1,512	9%
60,000	0.19	48,600	0.3	2,074	31,946	2,662	1,500	1,162	12%
50,000	0.15	42,500	0.3	2,074	27,676	2,306	1,500	806	18%
40,000	0.14	34,400	0.3	1,442	22,638	1,887	1,250	637	22%
30,000	0.12	26,400	0.3	1,442	17,038	1,420	1,000	420	34%
20,000	0.08	18,400	0.3	1,442	11,438	953	750	203	70%

3.4.29 To take out a loan of more than £15k will require a household income of at least £60,000. See Table 9 - £15,000 loan initial affordability assessment, below.

Table 9 - £15,000 loan initial affordability assessment

£15,000 loan, £177 monthly repayment, figures in £									
Household income (gross)	Effective tax rate*	Net	Average mortgage % of income**	Average utility costs pa ***	Residual net income	Monthly equivalent	Other monthly spend****	Residual	Loan repayment as a % of 'residual' income
100,000	0.276	72,400	0.3	2,775	47,905	3,992	1,500	2,492	7%
90,000	0.26	66,600	0.3	2,775	43,845	3,654	1,500	2,154	8%
80,000	0.245	60,400	0.3	2,775	39,505	3,292	1,500	1,792	10%
70,000	0.22	54,600	0.3	2,074	36,146	3,012	1,500	1,512	12%
60,000	0.19	48,600	0.3	2,074	31,946	2,662	1,500	1,162	15%
50,000	0.15	42,500	0.3	2,074	27,676	2,306	1,500	806	22%
40,000	0.14	34,400	0.3	1,442	22,638	1,887	1,250	637	28%
30,000	0.12	26,400	0.3	1,442	17,038	1,420	1,000	420	42%
20,000	0.08	18,400	0.3	1,442	11,438	953	750	203	87%

3.4.30 The methodology for the affordability calculations is set out in Appendix 1. The table below provides further sensitivity analysis on affordability by adjusting the interest rate to +/- 1% of the central 6.1% figure, which aligns to the sensitivity undertaken in the Financial Case, below.

Table 10 - Sensitivity analysis of loan affordability

Affordability Sensitivity Analysis									
Loan value	**£7,500**			**£12,000**			**£15,000**		
Interest rate	**5.10%**	**6.10%**	**7.10%**	**5.10%**	**6.10%**	**7.10%**	**5.10%**	**6.10%**	**7.10%**
Monthly repayment (£)	**£ 81.00**	**£ 85.00**	**£ 89.00**	**£ 130.00**	**£137.00**	**£143.00**	**£ 163.00**	**£171.00**	**£179.00**
Household income (gross)	**Loan repayment as a % of 'residual' income**								
100,000	3%	3%	4%	5%	5%	6%	7%	7%	7%
90,000	4%	4%	4%	6%	6%	7%	8%	8%	8%
80,000	5%	5%	5%	7%	8%	8%	9%	10%	10%
70,000	5%	6%	6%	9%	9%	9%	11%	11%	12%
60,000	7%	7%	8%	11%	12%	12%	14%	15%	15%
50,000	10%	11%	11%	16%	17%	18%	20%	21%	22%
40,000	13%	13%	14%	20%	21%	22%	26%	27%	28%
30,000	19%	20%	21%	31%	33%	34%	39%	41%	43%
20,000	40%	42%	44%	64%	67%	70%	80%	84%	88%

Establishing Market Potential

3.4.31 The extent of the potential market within the target area is a critical factor in understanding both the scale of the potential challenge and how far a fund could contribute to the delivery of the required outcomes. It also gives potential funders confidence that there is a market to explore, and then demand to accompany it.

3.4.32 For the purposes of this business case, we assume the geographical extent of the market to cover the local authorities set are set out in Table 11 below.

Table 11 - Geographic area proposed for loan fund

Counties and Districts	Unitary Authorities
Devon County Council	Bath and North East Somerset Council
East Devon District Council	Bournemouth, Christchurch and Poole Council
Exeter City Council	Bristol City Council
Mid Devon District Council	Cornwall Council
North Devon District Council	Dorset Council
South Hams District Council	(Council of the) Isles of Scilly
Teignbridge District Council	Isle of Wight Council
Torridge District Council	North Somerset Council
West Devon Borough Council	Plymouth City Council
Gloucestershire County Council	Portsmouth City Council
Cheltenham Borough Council	Somerset Council (see note below)
Cotswold District Council	Southampton City Council
Forest of Dean District Council	South Gloucestershire Council

Counties and Districts	Unitary Authorities
Gloucester City Council	Swindon Borough Council
Stroud District Council	Torbay Council
Tewkesbury Borough Council	Wiltshire Council
Eastleigh Borough Council	Note: Somerset Council (unitary authority) analysis is based on the constituent former local authorities which merged to create it – Mendip, South Somerset, Somerset West and Taunton, and Sedgemoor.
Fareham Borough Council	
Gosport Borough Council	
Havant Borough Council	
New Forest District Council	

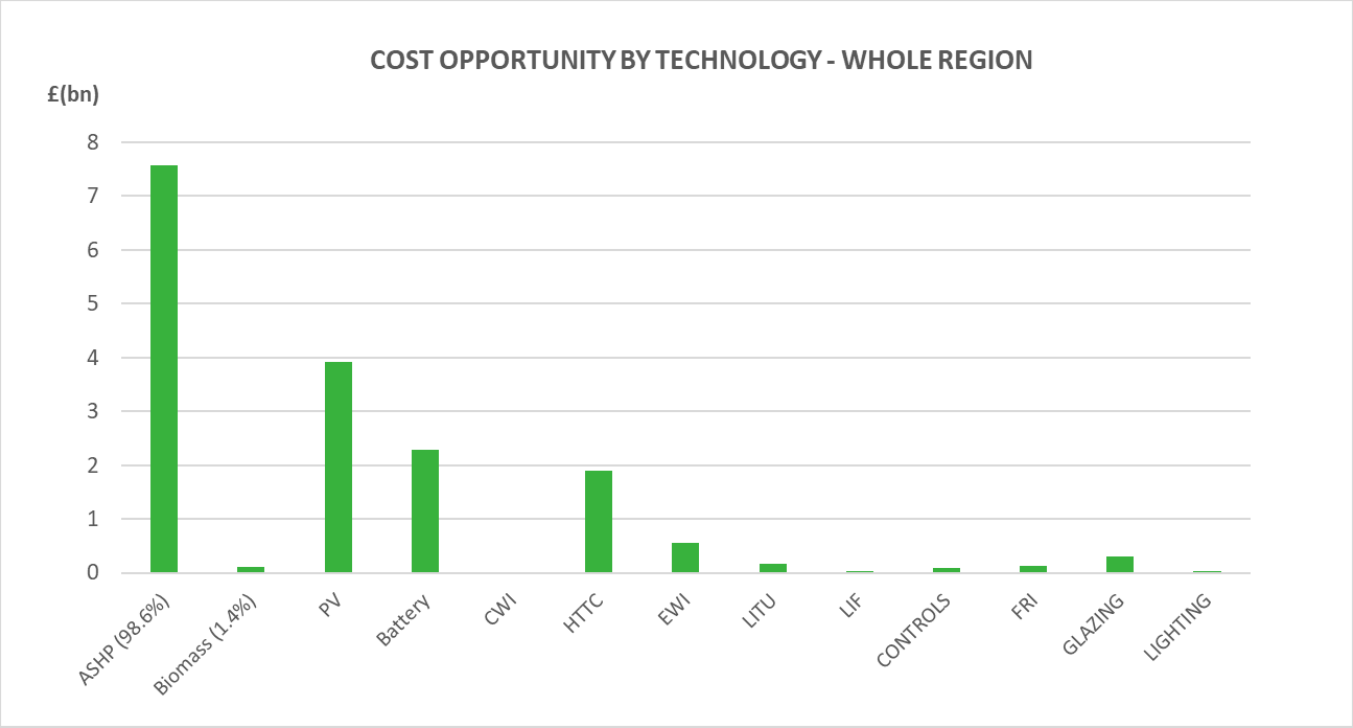
3.4.33 To establish the market potential, we used household-level data extracted from our proprietary software system. This system provides property-level insight into the existing housing stock and can provide a granular picture of those measures which could be delivered. It uses a combination of publicly available data sources (primarily EPC, but a range of others such as the NEED database) combined with a set of bespoke a data-led algorithms to generate high granular retrofit intelligence to generate the total estimated number of Permitted Energy Technologies - for which data exists - at LSOA level within each of the Target Authorities has been established. The dataset which has been developed accompanies this business case and is provided in Excel format. The Target Authorities covered by the analysis, as instructed by the Combined Authority.

Size of the market and opportunities for investment

3.4.34 The total opportunity for investment in retrofit across the 37 authority areas is estimated to be around £17.1bn. There is clearly ample scope for an Able to Pay Loan Fund within the target region. A fund value of £100m will be a first step in supporting the residential sector to become net zero.

3.4.35 A significant proportion of the fund could be spent in the transition to clean heat – for which we have currently assumed heat pumps will make up most of that transition. The decarbonisation of heat – which should be undertaken with sensible energy efficiency measures – therefore offers the largest opportunity for the fund, which in combination will require nearly £10.5bn of investment. The remaining £7 billion will be spent on insulation and energy efficiency measures (£2bn) and solar and battery storage £5bn. See Figure 6 - Total cost opportunity for whole region (top 3 deciles), below.

Figure 6 - Total cost opportunity for whole region (top 3 deciles)

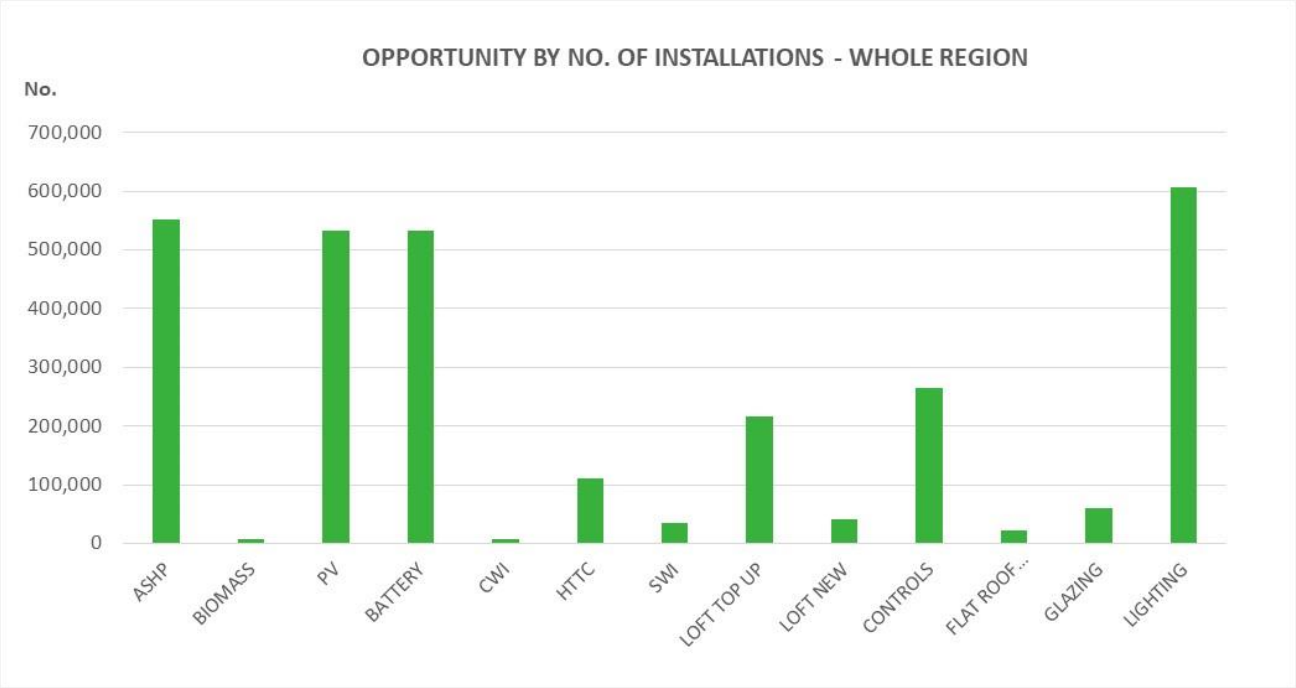


3.4.36 The assumed use of biomass – in 1.4% of rural / off gas cases – reflects the current take up of the Boiler Upgrade Scheme when compared with other solutions. PV, hard to treat cavity walls (for which we have assumed a solid wall insulation solution) and solid walled properties, represent most of the rest of the potential spend.

3.4.37 Most of the on-site energy generation will be based on photovoltaics rather than solar thermal, given existing costs and returns for the technology.

3.4.38 The 'cost opportunity per technology is not proportionate to the number of installations. Our research suggests that those technologies with the highest deployment rates under the scheme for the region are ASHPs, Solar PV, batteries and lighting, each at around 550-600k deployments per technology type. See Figure 7 - Total number of potential installations – whole region (top 3 deciles), below, for more information.

Figure 7 - Total number of potential installations – whole region (top 3 deciles)



3.5 Main Benefits and Risks

3.5.1 This section of the business case sets out the primary risks and benefits of the retrofit loan fund. It summarises risks and benefits that are articulated more fully in other parts of the business case but are summarised here.

Uptake of measures

3.5.2 All benefits derived from the fund are contingent on homeowners installing retrofit measures using finance form the fund. Evidence suggests that only a minority of homeowners can afford significant retrofit measures such as heat pumps without additional finance. On this basis the lack of available finance constitutes a real barrier to uptake of retrofit measures in the owner-occupier sector that would be addressed by the Able to Pay fund.

Decarbonisation

3.5.3 We expect decarbonisation driven by the fund to take two forms, driven by installation of retrofit technologies. First is the reduction in energy usage through the reduction in demand associated with better insulation. Second, is the decarbonisation of the heating source itself through the installation of low carbon heating methods such as heat pumps.

3.5.4 Uptake of low carbon heating systems will result in decarbonisation of the heating of homes in the South West, and is expected to account for the majority of greenhouse gas emissions modelled in the Economic Case, around 503,000 tonnes CO_2e. The exact extent of these carbon emissions savings will vary by property type, their location and the broader measures undertaken such as insulation to reduce energy demand. Demonstrating this decarbonisation benefit through increased uptake of measures will be key to showing the scheme has been successful. A full discussion of the carbon savings of the fund are in the Economic Case in section 8.

Energy and bill savings

3.5.5 The installation of insulation measures such as external, cavity wall, loft insulation and improvements to building fabric more generally are associated with reductions in energy usage. As a result, homeowners can expect lower energy consumption and lower energy bills compared to than before these works are undertaken.

3.5.6 The payback period of the measures – the time by which the measures pay for themselves through the energy bill savings - will vary but will offset repayments for the loans for the works initially, and in the long term could represent a net saving to the consumer. This is even more likely in cases where homeowners choose to install energy generation technology where they can be paid for export to the grid, such as rooftop solar.

3.5.7 Repayments must remain affordable with an attractive and accessible interest rate, but in combination with grants that remain available for the foreseeable future, and the gradual

rise in energy prices (set to increase by 5% in January 2024)[59] we envisage that the benefits of energy saving will be attractive to this segment of the market, and straightforward to promote.

Increased consumer choice

3.5.8 The introduction of this Fund has the benefit of increasing the choice of options to homeowners seeking to undertake energy retrofit. There is a clear gap in the level of support for this cohort of the population. Affordable finance is a major gap in the market as outlined elsewhere in this Business Case.

3.5.9 There are currently limited market options for the able to pay market seeking funding for retrofit measures either publicly or privately funded. As we have seen, the private retrofit finance market is nascent and linked closely to mortgages, and public funds for retrofit finance are targeted at the fuel poor and those in social housing, not the owner-occupier section that this scheme addresses. The introduction of this fund would address this lack of consumer choice and offer an alternative that could spur or increase consumer choice and competition within the retrofit finance market.

Supporting expansion of the retrofit workforce

3.5.10 As has been noted in previous Gemserv research, and elsewhere in this report, a lack of demand for retrofit measures in the South West has proven to be a constraint on the development of a retrofit workforce capable of deploying retrofit measures that are sufficient to meet net zero. As we have seen, the focus of UK government policy on the fuel poor and those in social housing has prevented the growth of the market in the owner-occupier sector which has stymied the growth of the retrofit market more generally, given that 64% of the UK's property market is owner occupier.

3.5.11 It follows that greater investment in, and uptake of retrofit measures will drive the growth of the supply chain and associated skills for retrofit measures as the supply chain responds to demand in the market. This in turn will spur job creation and economic growth as the market expands.

3.5.12 It is unclear whether the fund alone will be sufficient to drive this growth, and whether additional UK government funding or support for training will be needed. These risks are explored below. What is clear is greater demand is a necessary element of the solution.

Demonstration of return to investors

3.5.13 Successful implementation of the fund will demonstrate to potential private sector investors two key points. First, is that the delivery of a fund of this type is possible from an implementation and delivery perspective. Second, is that such a fund can be profitable, provide a strong return on investment at low risk to investors. Our modelling suggests that the Retrofit Loan Fund will provide a consistent, low risk return to investors. This is inherent to the nature of the fund. Borrowers will have a secured asset, robust credit scores. Payback

[59] Energy price cap: What is it and what will happen to bills in January? - BBC News

periods are generally long, with interest rates consistent with the asset and borrower credit profile. If successful, this will establish investor confidence in the medium to long term in retrofit finance mechanisms/funds that will catalyse the retrofit finance market.

Service, Delivery and Reputational Risk – Operationalising the Fund

3.5.14 Delivering this fund will require significant resource invested in marketing and engagement of homeowners, with comprehensive promotion across the target area. It will therefore be very high profile, and done well, will garner significant interest. Conversely, this 'increases the stakes' in terms of reputational risk for the partners. Reputations of the responsible parties will therefore be closely linked to successful delivery.

3.5.15 Delivery risks for the fund in this context extend to three broad categories. First is the administration risk of the fund. This refers to issues with administering funds, collecting payments, poor customer service. These are 'front facing' risks that interfere with the customer experience of the fund and are likely to discourage more borrowers from using the fund.

3.5.16 The second risk applies to the reputational risk of the loans themselves. This involves issues such as higher than expected default rates, challenges with repayments. This would impact both borrower and investor confidence in the fund. For borrowers, it would at best create the impression of poor administration and modelling, and at worst it could create the perception of profiteering at the expense of homeowners. For lenders it would undermine confidence in the profitability of the fund and undermine the investor base.

3.5.17 The third risk is with the measures themselves. While we intend that the choice of measures and installer is a matter for the homeowner/borrower, there is a risk that if the fund supports measures that are installed poorly, are inappropriate for the homes they are selected, and/or do not deliver the benefits anticipated, this could be attributed incorrectly to the fund itself.

3.5.18 To mitigate these risks the highest quality delivery partners with the proven experience of domestic retrofit will be essential as well as appointment of highly competent PR agency support. Steps to ensure that such a partner(s) will be found are set out in the Commercial Case.

3.5.19 The fund will require robust governance arrangements as set out in the Management Case. In addition, significant support from local community energy groups should be secured from the outset, to generate early buy-in and credibility and to provide independent advice on the appropriateness of measures.

3.6 Constraints and Dependencies

Consumer Attitudes and Demand

3.6.1 Perhaps the most significant risk/dependency relates to ensuring actual customer demand for the Fund. Evidence suggests that even with the correct financing and policy frameworks in place, consumer demand for and confidence in retrofit measures is low. Research from the Citizen's Advice Bureau (CAB) found that less than half of the homeowner groups surveyed

were interested in installing a retrofit measure. To compound this issue, it further found that only 1 in 5 were willing to borrow to invest in retrofit measures – either through a mortgage or unsecured loan.

3.6.2 A key lesson learned from the Green Deal was the ineffective and under-resourced marketing and engagement strategy. The financial modelling (Financial Case) includes significant budget for this activity – which must include positive and impactful media stories and output to support the right messaging. Over 1 in 3 homeowners surveyed by CAB said they had concerns about the suitability or effectiveness of the measures. However, willingness to install measures does increase once information and understanding of the benefits improves.

3.6.3 We would strongly recommend that the next 12 months includes more extensive householder engagement using locally trusted organisations and groups to establish in detail the barriers to take up. A comprehensive, South West focused, customer market research exercise is needed, to support the build up to the launch of the Fund and define the engagement and marketing strategy. This exercise should be undertaken in parallel to efforts required to establish the fund, covered in future sections of this business case.

Investor Attitude and Demand

3.6.4 A dependency of the success of the fund will be investor attitudes and commitment. The nature of a mixed fund, consisting of both public and private capital, is the necessity of attracting private investors willing to invest capital in the fund. For this to happen investors must be confident of attracting a suitable return.

3.6.5 It is possible that the fund could attract insufficient investor interest to be viable. This is possible in two broad ways. First, an insufficient number of investors apply. This concentrates the risk of the capitalization of the fund into too small an investor base. Second, the fund fails to attract enough capital to be viable. This can be mitigated by assuring the market that there is sufficient market for a fund of this size (economic opportunity), that return on investment is sufficient, and that the risk of default from borrowers is within an acceptable range of risk.

3.6.6 As part of the research conducted to inform this business case, and particularly the strategic case for investment, we have reached out to a range of stakeholders to access learning from previous and current projects, and the investment community at large. This included the UK Infrastructure Bank, the Green Finance Institute, the Department for Energy Security and Net Zero, the Connected Places Catapult, regional stakeholders including the Southwest Net Zero Hub, and private fund and asset managers.

3.6.7 Questions asked of consultees was focused on views and opinions of the emerging proposals set out in this Business Case, experience and knowledge shared from previous and current projects directly relevant to these proposals, and key barriers and challenges to be considered in the successful implementation of an Able to Pay fund.

3.6.8 A consistent theme raised in the consultations was the perception of retrofit and finance to deliver retrofit within the Able to May market. This is largely driven by feedback from other projects but also based on feedback from lenders with regard to existing green finance products available in the market. Consideration needs to be made of creating further demand for retrofit in the Able-to-Pay market as demand will drive both the emergence and uptake of retrofit products. Another key risk to this project was seen by investors as the technical difficulty associated with individual household retrofit, potentially requiring bespoke solutions, and managed by the consumer/Retrofit Coordinator. This can hinder efficiency and scalability however the loan fund operates.

3.6.9 Part of the learning from other projects and consultees reflections was that a "One Stop Shop" approach led by Local Authorities had the most potential to deliver the outcomes in this market. This is because Local Authorities are considered trusted advisors in this space and could engage and educate residents in their areas on a non-commercial basis. The MCS Foundation is also seeking to implement something similar from 2024/25.

3.6.10 From a finance sector perspective, the feedback was that green finance products and particularly green mortgages have developed well over the last 2 years. However, uncertainty remains about the scale required to keep these products viable for lenders. Currently, even at very low interest rates these products have not had mass market appeal. Ultimately, the product will need to provide a return for lenders, generated through wide-spread uptake of these products. Our proposal for a blended public-private loan fund seeks to address these issues by incorporating the trusted relationships from the public sector, and utilizing public investment to de-risk investment for the private sector, resulting in more efficient use of public money, and garnering wider benefits than simply utilising the money for grant funding.

3.6.11 Investors were also keen to understand that the fund is intended to operate around established industry consumer redress mechanisms and standardisation, to reduce the risk associated with installation and redress.

National Policy and Strategy

3.6.12 Consistency and certainty of national retrofit strategy remains a key concern, especially with elections coming forward in 2024. A consistent message at national level – with firm and fixed dates for transitioning away from fossil fuels within the sector is critical. Putting back target dates for the replacement of gas boilers (for example) reduces any perceived urgency and raises yet another barrier to widespread adoption of technologies.

3.6.13 The quantum of loan funding required in any given household will also be dependent on the level of accompanying household grant available -through the Boiler Upgrade Scheme for example. The availability of the grant – as well as the period over which it remains accessible for households – also needs to be fixed. It will support the implementation of the Fund through its pilot phase as a vital part of encouraging (early adopter) demand as economies of scale in the sector are achieved across all required technologies.

3.6.14 It would make sense, therefore, for the partners involved in the Fund to engage all political parties at the earliest opportunity to explain the project and its objectives, and the potential value it will generate.

Supply Chain Capacity and Capability

3.6.15 The Gemserv retrofit skills report (April 2023)[60] undertaken on behalf of the SWNZH, concluded that the South West faces severe labour shortages in the key roles of heat pump engineers, heat pump electricians and solid wall insulation installers. Specifically, the report set-out that:

- To scale up its workforce to install enough measures, the region requires a compound annual growth rate of 79% for heat pump engineers, 89% for heat pump electricians and 90% for solid wall insulation installers, in order to reach net zero by 2030.
- The demand for solid wall insulation installers means that an additional 3,400 FTE solid wall insulation installers are required by 2027 across the region to meet net zero targets.
- The demand for heat pump engineers means that a minimum 8,786 additional engineers are required by 2028 across the region.
- There are also significant challenges in relation to the supply chain for cavity wall insulation installers, retrofit coordinators, and retrofit assessors which each require a compound growth rate of (respectively) 22%, 39% and 17% per year on average,

3.6.16 The need for supply chain growth is clear. A combination of central government intervention to support training and skills development and commercial (installer) investment in the work force will be needed to deliver the longer-term strategic objectives and outcomes.

[60] Gemserv, 2023. Available here: South west net zero hub retrofit skills report (gemserv.com)

ECONOMIC CASE

4 CONTEXT

4.1 The Region

4.1.1 The South West region includes the local authorities of Bristol, South Gloucestershire, Bath and North East Somerset, North Somerset, Cornwall, Isles of Scilly, Torridge, West Devon, South Hams, Teignbridge, Exeter, East Devon, Mid Devon, North Devon, Plymouth, West Somerset, Taunton Deane, Sedgemoor, Mendip, South Somerset, Torbay, Cheltenham, Cotswold, Forest of Dean, Gloucester, Stroud, Tewkesbury, Bournemouth, Poole, West Dorset, North Dorset, East Dorset, Christchurch, Purbeck, Weymouth and Portland, Swindon and Wiltshire. The region is home to 5.7 million people, with just under 550,000 jobs and a gross domestic product (GDP) of £164 billion.

4.1.2 As described in the Strategic Case, the region has clear and ambitious net zero targets. All the Local Authorities in scope of this potential scheme, except the New Forest, have declared climate emergencies with net zero targets by 2030, 20 years ahead of the UK Government's national target.

4.1.3 Noticeable progress has been made toward these goals. For example, the West of England Combined Authority region saw a 35% reduction in carbon emissions between 2005 and 2018 with total air emissions falling from 7,927 $ktCO_2$ (2015) to 5,154 $ktCO_2$ (2018).

4.1.4 Gemserv's recent retrofit skills report for the South West Net Zero Hub found that the current deployment rates of low carbon heating and insulation measures in the region are insufficient to meet even the Government's 2050 net zero targets. The report concluded that at current deployment rates for each measure it would take the following amount of time to meet net zero:

- It would take nearly 600 years to deploy enough sold wall insulation measures.
- It would take 132 years to deploy sufficient loft insulation and 166 years to deploy sufficient cavity wall insulation to meet net zero.
- It would take 200 years to install enough air source heat pumps (ASHPs) and 278 years to install sufficient ground source heat pumps (GSHPs) to meet net zero.

4.2 Strategic Rationale

4.2.1 This case investigates the economic rationale for Government intervention in encouraging finance solutions and domestic retrofit, and compares investment scenarios compared to a Business as Usual scenario. This section will also evaluate scheme design and management options.

4.3 Approach

4.3.1 This Economic case is split into two parts:

- Part 1 investigates the overall rationale for intervention at fund scale, evaluating the benefits of two types of intervention compared to a Business As Usual case, and arriving at a preferred type of intervention.
- Part 2 appraises the methods of delivering that intervention to arrive at a suitable fund structure, given the strategic objectives as established in the previous section.

PART 1: OVERARCHING OPTIONS

5 CRITICAL SUCCESS FACTORS – OVERARCHING OPTIONS

5.1 Overview

5.1.1 A list of critical success factors has been developed and which provide a consistent set of metrics through which initial scheme design options were analysed and discounted.

Table 12 - Critical Success Factors

	CRITICAL SUCCESS FACTORS
1	The scheme must contribute to decarbonisation (greenhouse gas emission reduction) in the region, across participating households (residential energy consumption), and up to 2050 – the UK's target net zero date.
2	The scheme should deliver economic and social value for UK Plc.
3	The scheme must be sufficiently attractive to meet investors' hurdle rates and risk appetites – be those from public or private sector organisations – to ensure the scheme can facilitate effective retrofit for participating households at scale.
4	The scheme should promote job creation and retention in the Low Carbon and Renewable Energy Economy sector (see ONS definition of LCREE).
5	The scheme should offer an alternative financing solution for homeowners, adding to the currently available suite of products and services, and provide energy bill reductions as a result of the installation of energy efficiency measures).
6	Reputational benefits. As the scheme is a trial, it is important that the scheme is viewed positively by the supply chain (including installers), investors, consumers, the public sector and policymakers.

6 SHORTLIST OF OVERARCHING OPTIONS

6.1 Option 0: Business as Usual

6.1.1 Under the 'Business As Usual' (BAU) scenario, current energy efficiency, low carbon heat and general retrofit measure deployment trends are extrapolated and projected to 2049. Energy efficiency and low carbon measure markets are mostly driven by the availability of government grants and policies, such as the Boiler Upgrade Scheme (BUS), Home Upgrade Grant (HUG) and Energy Companies Obligation (ECO) and existing market incentives such as solar export tariffs. Export tariff is the rate at which households with solar panels are reimbursed for every kWh of electricity that is exported to the electricity grid. Expected future regulation like the 2035 oil boiler ban is also taken into account.

6.1.2 The BAU scenario assumes that Able to Pay (ATP) households would have access to current market interest rate loans only.

6.2 Option 1: Public Grant Scheme

6.2.1 Under Option 2, a regional public grant scheme is set up to support retrofit measures. This scheme is be similar to the Boiler Upgrade Scheme (BUS) in many respects, but, unlike BUS vouchers, the Option 2 grant would support all energy efficiency and low carbon measures set out in Table 5.

Table 13 - Assumptions for Public Grant Scheme

ASSUMPTION	DESCRIPTION
Size of the public fund	£34 million
Amount of support per voucher	To ensure comparibility with existing public grant schemes, such as the Boiler Upgrade scheme, this analysis assumed £7,500 vouchers to be distributed under Option 1.
Additionality	In line with the Boiler Upgrade Scheme Impact Assessment, this analysis assumes an additionality rate of 100%[61]. This means that 100% of the households redeeming a vouchers would not have carried out any low carbon or energy efficiency measures under the Businnes As Usual Scenario.
Take up of vouchers	This analysis assumes that only 80% of the £40 million budget would be used up due to low awarenessof the scheme.
Replaced heating systems	To determine the split of the replaced heating systems, this analysis uses BUS statistics[62].

[61] BEIS (2022) Future Support for Low Carbon Heat: Boiler Upgrade Scheme (BUS)
[62] DESNZ (2023) Boiler Upgrade Scheme statistics

6.3 Option 2: Public-Private Blended Loan Scheme

6.3.1 Under Option 1, a blended fund of public and private capital is set up for Able to Pay (ATP) customers. As part of the scheme, borrowers can access loans at subsidised interest rates to carry out energy efficiency and/or low carbon measures. Eligible technologies are set out in Table 5, above, and the measures that are modelled as part of this economic assessment are shown in Table 16, which follows. Table 14 below sets out the key assumptions for this Option 1.

Table 14 - Key assumptions for Public/Private blended loan scheme

ASSUMPTION	DESCRIPTION
Public investment into loan fund	£40 million
Private capital investment into loan fund	£60 million
Total loan fund size	£100 million
Additional Total Government subsidy	£34 million net subsidy (£10m directly into investment fund, £24m for fund management costs)
Subsidised interest rate	6.10% (for Tranche A – capital interest payments over 10 years)
Additionality	In line with previous low carbon scheme impact assessment, this analysis assumes an additionality rate of 100%[63]. This means that 100% of the households that secured a loan as part of the ATP scheme would not have paid for the installation of any of the low carbon or energy efficiency measures featured under the Businnes As Usual Scenario. This assumption is tested in the sensitivity analysis section of the report.
Replaced heating systems	To determine the split of the replaced heating systems, this analysis uses Boiler Upgrade Scheme statistics[64].

[63] BEIS (2022) Future Support for Low Carbon Heat: Boiler Upgrade Scheme (BUS)
[64] DESNZ (2023) Boiler Upgrade Scheme statistics

7 IMPACTS / BENEFITS APPRAISAL

7.1 Analytical Approach

7.1.1 The methodology and the structure of the economic model is described in this section. As shown in Figure 8, below, inputs are fed into the economic model from a range of data sources such as Census 2021, MCS and other ONS data, complimented with DESNZ, HMT and CCC assumptions. These inputs are used to construct: (1) archetype; (2) heating system; (3) power system; and (4) building fabric models, and model the interactions between these systems. To represent the wider SWNZH region, the archetypes are scaled up using Census 2021 data and current retrofit trends are extrapolated to project future deployments without government intervention. This Business As Usual (BAU) scenario is then compared to Option 1 and Option 2 scenarios to assess the impact of the government intervention on: (1) capital costs; (2) cost of energy supply; (3) carbon costs; and (4) air quality costs.

Archetype Model

7.1.2 Gemserv constructed five property archetypes, featured in Table 15, below, which represent the variety of building-types that make up the owner-occupied dwelling stock in the South West region. Owner occupied dwellings include freehold and leasehold properties.

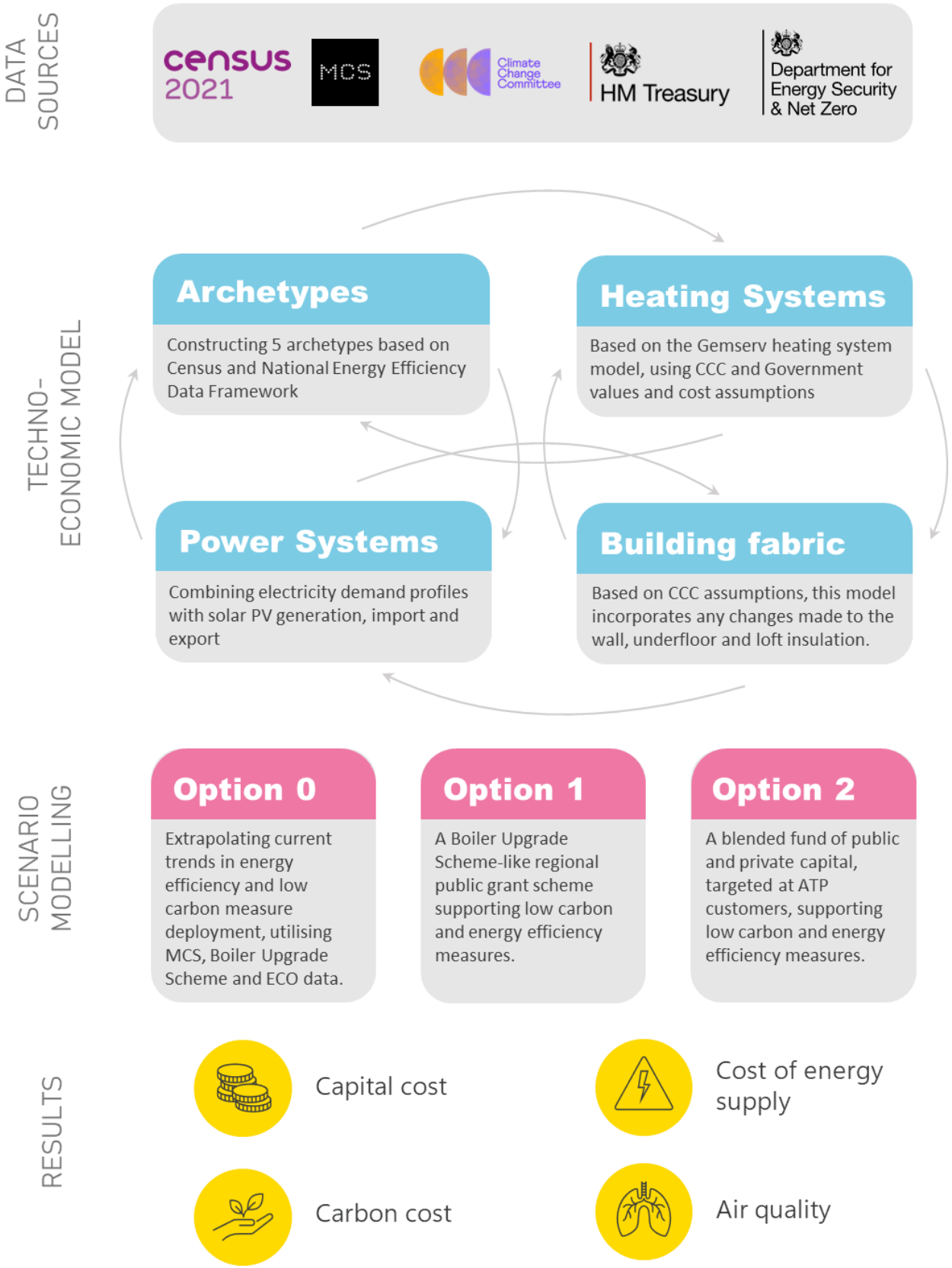
7.1.3 When fed into Gemserv's heating system, power system and building fabric model, the characteristics of the 5 base archetypes vary depending on (1) dwelling type, (2) heating system and (3) retrofit level.

Table 15 - Archetype Summaries

BASE ARCHETYPE	HEATING SYSTEM	RETROFIT LEVEL
PRE 1965 DETACHED	OIL BOILER	BASELINE
POST 1965 DETACHED		PACKAGE 1
PRE 1965 SEMI DETACHED	GAS BOILER	PACKAGE 2
POST 1965 SEMI DETACHED		PACKAGE 3
TERRACED	AIR SOURCE HEAT PUMP	PACKAGE 4
		PACKAGE 5

7.1.4 Using MCS Data Dashboard, Census 2021 and other ONS data, these archetypes were scaled up to represent the South West region. Domestic properties built after 2021 are not included in the model.

Figure 8 - The structure of the economic model used to assess the impact of Option 1 and Option 2



Packages of Measures

7.1.5 As described in the Strategic Case, we advocate that the ATP loan scheme is developed to allow householders to access finance for a wide-range of low carbon heating, insulation, and energy efficiency measures – to align with property requirements, household budgets and consumer preferences. This impact assessment seeks to provide a digestible and useful analysis by simplifying the variety of technology combinations to an indicative shortlist of five typical packages of measures which could be taken up by borrowers. Table 16 sets out the composition of each of the five packages, which includes package 1 – an ASHP, radiator upgrade, hot water cylinder, retrofit coordination and assessment, for example. This package, however, would only be available to off grid households. This package, or a package of measures similar to this dependent on the homeowners requirements, is envisaged to be the main opportunity within the region as established in section 3.4, and given average installation costs, is also achievable with the minimum loan amount (assuming uptake of the Boiler Upgrade Scheme), and is also used as the basis for financial modelling in section 19 (see Table 30 - Cost of Measure Packages).

Table 16 - Measure package description

TECHNOLOGY	BASELINE	PACKAGE 1	PACKAGE 2	PACKAGE 3	PACKAGE 4	PACKAGE 5
Fossil fuel boiler	●					
Air-source heat pump		●	●	●	●	
Radiator upgrade		●	●	●	●	
Hot water cylinder		●	●	●	●	
Solar PV			●	●		●
Li-ion battery			●	●		●
External wall insulation				●		●
Cavity wall insulation					●	
Loft Insulation					●	
Retrofit coordination		●	●	●	●	●
Retrofit assessment		●	●	●	●	●

Evidence base

7.1.6 To evaluate the economic impact of the policy option, assumptions were taken from the Green Book (2022) for the following variables:

1. Carbon values (the monetary value of traded and non-traded greenhouse gas emissions)
2. Electricity and fossil fuel air quality damage costs (the monetary value of airborne chemicals, particulates, and biological materials that cause harm to humans or damage the environment)
3. Electricity and fossil fuel carbon emissions factors (the amount of greenhouse gas emitted per unit of energy consumption)
4. Long run variable costs of energy supply (the cost of energy supply, excluding taxes, margins and fixed costs of transmission, distribution and metering)

7.1.7 All prices have been inflated to 2022 prices using the GDP deflator published by the Office for National Statistics.

7.1.8 A discount rate 3.5% is applied throughout the impact assessment to future costs and benefits as informed by the Government's Green Book (2022) methodology.

7.1.9 While the market discount rate is likely to be higher than 3.5%, a rate of 3.5% is used throughout the economic assessment to stay consistent with the Green Book methodology and enhance comperability with other policy appraisals. As the economic assessment is capturing costs and benefits incurred on an economy level, a discount rate of 3.5% .

7.1.10 Assumptions are discussed in further detail in the Annex 3 (section 24).

Counterfactual

7.1.11 In the counterfactual, current installation trends of air-source heat pumps, insulation measures and solar paneles are, mainly driven by government schemes, are extrapolated using BUS, ECO and MCS data.

7.1.12 Our assumption on uptake and replacement of heating systems (gas or oil boilers) are informed by Boiler Upgrade Scheme statistics.

7.1.13 Whilst some households with air-source heat pumps carry out further low carbon or energy efficiency measures spontanously under the Business As Usual scenario, no existing ASHP households are assumed to be eligible to take part in either Option 1 or Option 2 schemes.

Additionality

7.1.14 There is very limited evidence available on what share of low carbon and energy efficiency measure deployment would have been delivered in the absence of government intervention – i.e. which households would be installing the packages regardless of the availability of the ATP fund.

7.1.15 Regarding heat pump deployment figures, we aligned with previous policy impact appraisals, such as the Boiler Upgrade Scheme Impact Assessment. This Impact Assessment assumes an additionality rate of 100% - i.e. that each heat pump install would not have taken place in the absence of the availability of government incentive.

7.1.16 As the insulation market is mainly driven by ECO (with minimal deployment currently under the Great British Insualtion Scheme), this analysis assumed no overlap between ECO households and ATP consumers. Therefore, an additionality rate of 100% is applied to all building fabric measures.

7.1.17 No evidence was found on the additionality of solar PV and battery deployments. For consistency, however, this analysis continued to assume an additionality rate of 100%.

7.1.18 Given the uncertainty in additionality, separate sensitivity analysis is carried out in section 8.20 above.

Appraisal period

7.1.19 The appraisal period used in our analysis is 20 years, ranging from 2024 to 2044. The economic impact assessment was restricted to this period to ensure consistency between the financial and economic models.

7.1.20 As there are differences in the lifetime of all measures, all capital costs are annualised using a discount rate of 3.5%, and the costs compared on a consistent 'annual' basis.

7.1.21 With the lifetime of batteries and hot water tanks being less than 20 years, it is assumed that they are replaced at the end of their lifetime. The costs and benefits of these 'follow-up' measures are also considered in the social net present value calculation.

7.1.22 With the lifetime of building fabric measures and solar PV being more than 20 years, the capital cost of these measures is annualised and calculated on a pro rata basis.

Deployment

7.1.23 Deployment figures under Option 1 were set assuming 80% take up of the available budget. As any household can claim a voucher as part of the grant scheme, initial deployment rates are higher compared to Option 2, as shown in Table 17Table 17.

Table 17 - Deployment rates by financial year ending

FINANCIAL YEAR	2024/ 2025	2025/ 2026	2026/ 2027	2027/ 2028	2028/ 2029	2029/ 2030	2030/ 2031	2031/ 2032	2032/ 2033	2033/ 2034
PUBLIC GRANT	544	725	725	1450	181					
BLENDED FUND	175	525	1,050	1,050	1,050	1,050	1,103	1,138	1,190	1,190

7.1.24 Our assumption on type of displaced heating systems was based on BUS deployment statistics under both Option 1 and Option 2 scenarios. However, given the uncertainty around which households will choose to participate in either of these schemes, the sensitivities are carried out in section 8.2.

Capital and operational costs

7.1.25 Capital cost assumptions are taken from a range of reports and impact assessments commissioned by the Department of Energy Security and Net Zero.

7.1.26 All capital and operational costs are discounted to their 2024 value using a discount rate of 3.5%.

7.1.27 Capital cost assumptions are discussed in further detail in the Annex 3 (section 24).

Monetised costs and benefits

Net present costs and benefits given in this assessment are relative to the counterfactual (Business as Usual scenario).

7.1.28 All costs and benefits are given in £ (2022).

7.1.29 All costs and benefits are discounted to 2024 value.

7.1.30 The monetised costs and benefits include:

- Capital costs include the costs of any potential heating system replacement, retrofit measures and retrofit assessors and coordinators. Given the difference in lifetime of all measures, capital costs are annualised in this assessment. This means that capital costs include replacement costs after the lifetime of the measures.
- Value of energy supply savings, or long run variable cost of energy supply (LRVC), is used to estimate the energy savings. In contrast to energy bill savings, LRVC excludes taxes, margins and fixed costs of transmission, distribution and metering.
- Value of greenhouse gas emissions savings was calculated based on the Green Book carbon values. These values are aligned with the mitigation costs associated with decarbonising the UK economy and reaching net zero i.e. the value of reduced emissions.
- Value of air pollution savings was calculated based on the damage cost values published in the Green Book. These signify the wider economic savings (e.g. health costs and productivity) associated with reduced air pollution, and as a result lower morbidity and mortality.

Uncertainty

7.1.31 Some components of the economic model are uncertain:

- Deployment levels could change depending on the number of successful applicants and the combinations of packages of measures;
- Carbon and economic benefits are also subject to future carbon prices and the fuel systems replaced by the scheme;
- Although the financial case could model the expected operational costs of the fund manager, there is uncertainty around the administrational costs directly incurred by

Government. Costs and benefits derived from deployment could be different if heat pumps and other measures are not installed correctly.

7.1.32 Sensitivities have been carried out in section 8.2 to mitigate some of these uncertainties.

8 PREFERRED OPTION

8.1 Public Expenditure Estimates

Government subsidy

8.1.1 Table 18, below, shows the government subsidy needed for both government interventions:

Table 18 - Government subsidy needed for Option 1 and Option 2 in thousands of £ (2022)

FINANCIAL YEAR	2024/ 2025	2025/ 2026	2026/ 2027	2027/ 2028	2028/ 2029	2029/ 2030	2030/ 2031	2031/ 2032	2032/ 2033	2033/ 2034
PUBLIC GRANT	5,100	6,800	6,800	13,600	1,700					
BLENDED FUND	1,500	1,500	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000

	2034/ 2035	2035/ 2036	2036/ 2037	2037/ 2038	2038/ 2039	2039/ 2040	2040/ 2041	2041/ 2042	2042/ 2043	2043/ 2044
PUBLIC GRANT										
BLENDED FUND	700	700	700	700	700	700	700	700	700	700

8.1.2 Whilst both options have different spending profiles over the period, the scenarios have been developed to consider and compare the option for distributing the same value of public funding in two different forms – either an upfront grantor to subsidise a public-private loan scheme. This means that both options would involve spending £34 million of government subsidy.

Social net present value (SNPV)

8.1.3 Social Net Present Value (SNPV) is the current monetary value of a policy option. It is calculated by subtracting the net present value of costs from the net present value of benefits.

8.1.4 In this assessment, SNPV is given in 2024 value.

8.1.5 Table 19 below, shows the social costs and benefits of the two interventions relative to no government intervention (Business As Usual Scenario).

Table 19 - Social Net Present value compared to the Business As Usual Scenario

MILLION £, 2022	OPTION 1 PUBLIC GRANT	OPTION 2 BLENDED FUND
Capital Costs	-68.1	-139.2
Avoided Cost of Energy Supply	162.4	260.80
Value of GHG Emission Savings	40.2	79.8
Value of Air Quality Improvements	6.7	10.6
Total SNPV	142.2	212.0

8.1.6 Due to the high cost of energy efficiency measures and air-source heat pumps, scheme participants face higher capital costs under both options. However, higher CAPEX is outweighted by the avoided cost of energy supply, the value of GHG emission savings and the value of air quality improvements. Although the same type of measures are deployed under both scenarios, the cost benefit ratio differs due to difference in timelines, hence difference in relevant carbon prices and grid intensity. Due to greater reach and higher levels of deployment under Option 2, as shown in Table 17, the social net present value provided by a blended fund is significantly higher than the net benefits given by a public grant scheme.

Greenhouse gas savings

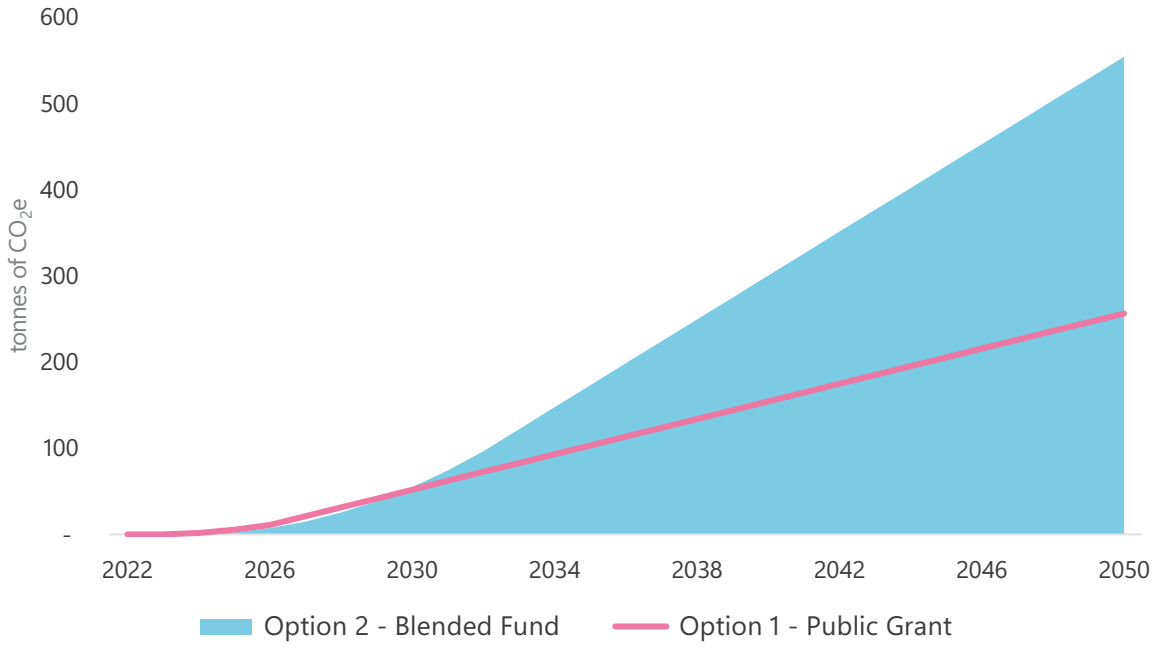
8.1.7 Our analysis suggests that distributing the Government funding through a blended fund could be more effective in reducing carbon emissions, given the crowding in of additional private sector finance, and increased uptake of mesaures with Option 2 cutting 191,603 tonnes more GHG emissions than Option 1.

Table 20 – Cumulative Greenhouse gas emission savings under Option 1 and Option 2 scenarios over a period of 25 years

SCENARIO	OPTION 1 - PUBLIC GRANT	OPTION 2 - BLENDED FUND
CUMULATIVE GHG EMISSION SAVINGS	184,906 tonnes of CO_2e	376,509 tonnes of CO_2e

8.1.8 Figure 9 shows the volume of greenhouse gas savings associated with Option 1 and Option 2. As the building fabric improvements last more than 20 years, and households are assumed to replace their low carbon technology at the end of lifetime, cumulative greenhouse gas savings continue to rise beyond the lifetime of the government interventions. Carbon benefits start increasing faster in the late 2030s as the carbon intensity of the electricity grid drops.

Figure 9 - Cumulative Greenhouse gas emission savings associated with scenarios (compared to Business as usual scenario)



8.1.9 Table 21, below, shows the value of these GHG emission savings calculated using Green Book values as well as projected ETS prices.

Table 21 - Value of GHG emission savings associated with Option 1 and Option 2

		OPTION 1	OPTION 2
GHG savings over 20 years (tonnes of CO_2e)		184,906	376,509
Using Green Book values	Discounted value of GHG savings (using a rate of 3.5%)	£40.2 million	£79.8 million
Using ETS price projections	Discounted value of GHG (using a rate of 3.5%)	£14.5 million	£29.7 million
	Undiscounted value of GHG savings	£21.1 million	£45.2 million

8.1.10 While projected ETS prices are suitable to give a general picture of the market value of abated emissions, it is noted that this is a theoretical indicator, with gas and oil consumption for domestic heating sitting outside of the scope of UK ETS.

8.1.11 Carbon Cost effectiveness

8.1.12 The carbon effectiveness of the two options is summarised in Table 22. Carbon effectiveness shows how much carbon emission can be abated using one unit of government subsidy. Our assessment suggests that using a blended fund to decarbonise homes is more effective, with nearly twice as much GHG emission being saved using the same amount of government support. This difference is driven by the greater reach of Option 2 and the utilisation of private capital.

Table 22 – Carbon Cost effectiveness of Option 1 and Option 2

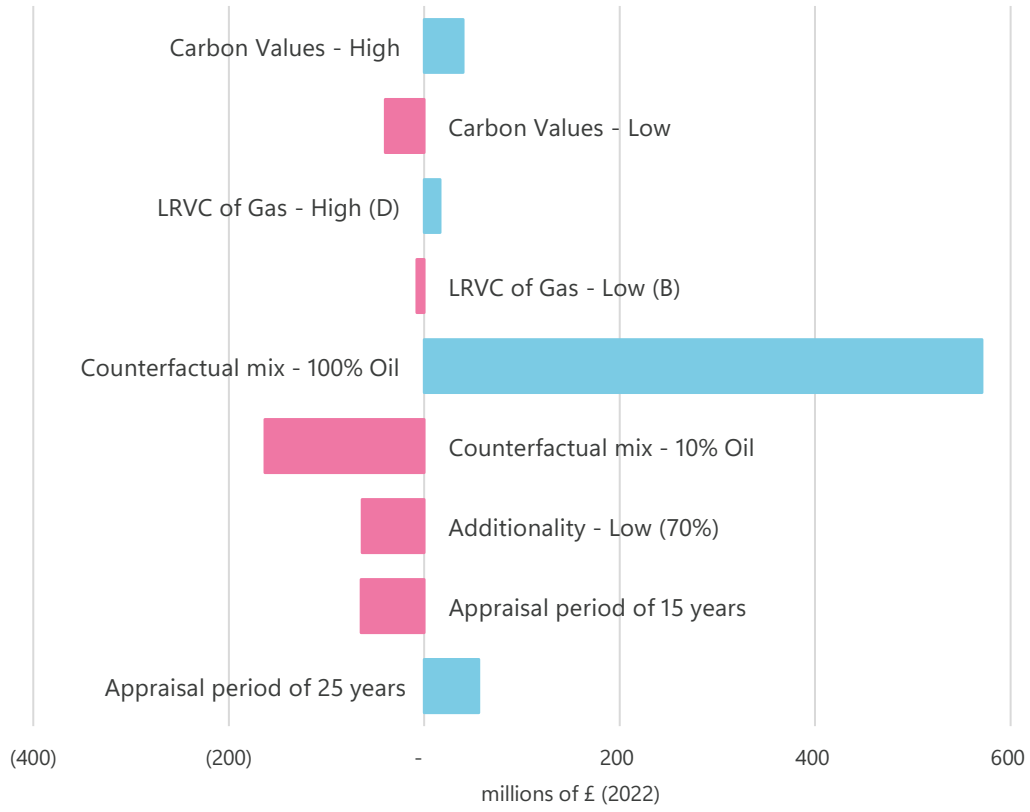
SCENARIO	OPTION 0 BAU	OPTION 1 PUBLIC GRANT	OPTION 2 BLENDED FUND
SUBSIDY (UNDISCOUNTED)	£0	£34,000,000	£34,000,000
SUBSIDY (DISCOUNTED)	£0	£31,765,794	£27,145,290
GHG EMISSION SAVINGS	0 tonnes of CO_2e	184,906 tonnes of CO_2e	376,509 tonnes of CO_2e
CARBON EFFECTIVENESS OF SUBSIDY (KGCO_2E / £ SUBSIDY)	N/A	5.8	13.9

8.2 Risk and Sensitivity analysis

8.2.1 As highlighted in 7.1.31, there are a number of uncertain assumptions which have a substanital influence on the modelling results. To address these uncertainties, a sensitivity analysis has been carried out. These include:

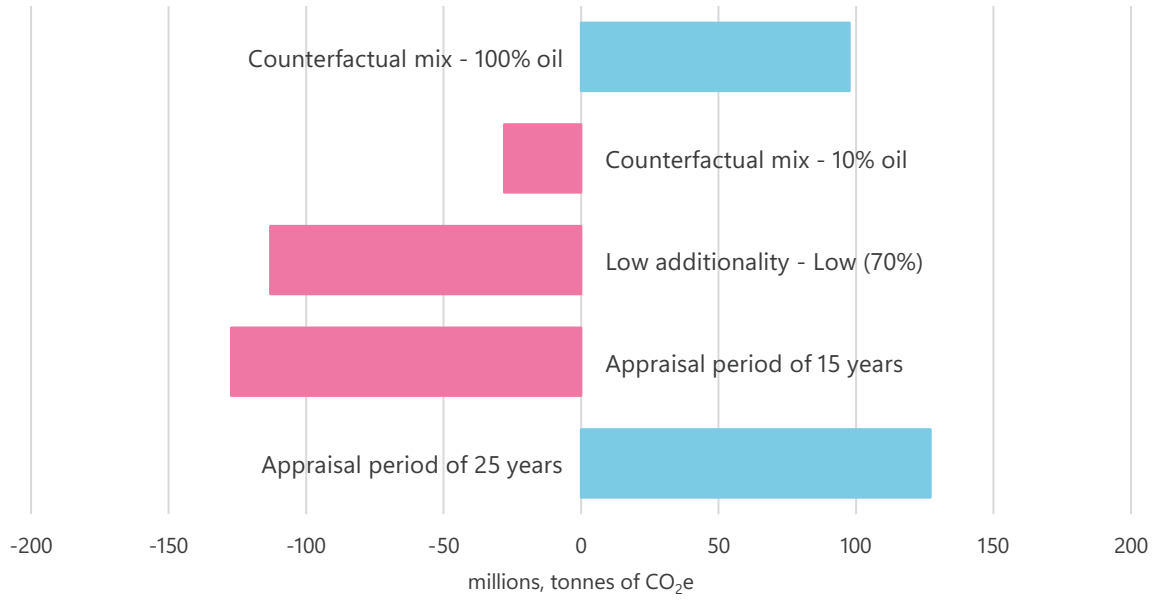
- Increasing and decreasing carbon value assumptions
- Increasing and decreasing the long run variable cost of energy supply for gas
- Assuming that only oil heated households take up support
- Assuming an additionality rate of 70%

Figure 10 - Difference to Social Net Present Value (SNPV) following sensitivity analysis, Option 2 – Blended Fund



8.2.2 As shown in Figure 10, sensitivity analysis suggests that changes in future carbon values, the cost of gas, replaced heating systems and the additionality assumption can all impact the Social Net Present Value. In line with previous low carbon impact assessments, the model is most sensitive to the counterfactual mix. Whereas increasing the share of oil heated households among the scheme participants increases the SNPV by approximately £570 million, decreasing it to 10% would only result in a £160 million drop. Additionality rate is also an important determinant, with nearly £60 million reduction in SNPV if 70% of additionality is assumed. The scheme has positive SNPV across all appraisal periods, with an appraaisal period of 15 years resulting in £56 million drop. Other factors, like carbon values and fuel cost, have marginal impact on social benefits. Although some factors can significantly change the result of this analysis, it is noted that the SNPV remains positivie across all senstivities. That is, the social benefits of the intervention always remains higher than the social costs.

Figure 11 - Difference to Greenhouse Gas (GHG) emission saving following sensitivity analysis, Option 2 -Blended Fund



Employment

8.2.3 An estimate af full time equivalent (FTE) jobs supported due to government intervention was calculated using Gemserv's green jobs model and assumptions from a range of data sources including the CCC's 6th Carbon Budget.

8.2.4 FTE figures were calculated by multiplying the number of certain measures with the corresponding time needed for deployment.

8.2.5 Jobs taken into account include:

- Retrofit coordinator;
- Retrofit assessor;
- Heat pump installer (engineer and electrician);
- Insulation installer (loft, EWI and CWI);
- Solar PV and battery system installer;
- Fossil fuel boiler installer.

8.2.6 Further assumptions are detailed in section 24.

8.2.7 Option 1 and Option 2 are estimated to create 208 and 543 full time equivalent (FTE) jobs, respectively. The difference between the two figures is mainly driven by differences in volume of deployed measures.

Table 23 - Estimate of cumulative FTE supported under Option 1 and Option 2

	OPTION 1	OPTION 2
Cumulative jobs	208 FTE	543 FTE

Non-monetised costs

8.2.8 Non-monetised Costs or those costs beyond the scope of this assessment include:

- Rebound effect – As all of the measures are expected to reduce energy bills through decreasing energy demand, some households may choose to consume more energy, given the bill savings;
- Hidden costs / hassle costs – The time the borrower spend on researching, arranging and preparing for the low carbon and energy efficiency measures;
- Electricity network congestion – With most packages including an air-source heat pump, electricity demand is expected to increase. Increasing power demand of low carbon technologies could drive up consumer bills through increasing electricity network costs[65].

8.2.9 Non-monetised benefits include:

- Consumer familiarity and perceptions – Increased installation levels in the South West could lead to increased awareness of low carbon and energy efficiency measures. Increased familiarity and positive perception of these technologies could trigger further deployments in the ATP market;
- Energy security and resilience benefits – reduced energy demand as a result of government intervention may improve security of supply and the energy system's resilience to supply and demand shocks;
- Learning and economies of scale – With increasing deployment rates and increasing employment effects, learning and productivity gains could translate into cost down over time;
- Health benefits – Warmer homes may have significant health benefits that can translate to decreasing absenteeism and decreasing costs for the NHS;
- Fuel poverty – Fuel poverty relates to households that spend a high proportion of their income on home heating. Government intervention may help households livingin fuel poverty by reducing energy bills.

8.3 Consideration of the Critical Success Factors

8.3.1 These factors were first defined in Table 12, and summaries are used for comparison below:

[65] BEIS (2022) Electricity Networks Strategic Framework: Enabling a secure, net zero energy system

Table 24 - Comparison of Critical Success Factor achievement

	OPTION 0	OPTION 1	OPTION 2
1: GHG Reduction	🔴	🟠	🟢
2: Economic & Social Value	🔴	🟠	🟢
3: Attractive to investors	🔴	🔴	🟢
4: Jobs	🔴	🟠	🟢
5: VFM for Householders	🔴	🟢	🟢
6: Reputational Benefits	🔴	🟢	🟢

🟢 Fully meets and/or exceeds the requirement / Critical Success Factor

🟠 Partially meets and/or falls short of fully meeting the requirement / Critical Success Factor

🔴 Does not meet the requirement / Critical Success Factor

8.3.2 As most Critical Success Factors (CSFs) are driven by the total number of reached households, Option 2 – Blended Fund has a higher RAG mark in four out of six CSFs. The two exceptions are (5) Value for Money for householders and (6) Reputational Benefits, both of which are fully met by Option 1 and Option 2.

8.4 Preferred option

8.4.1 Our analysis indicates that the Public expenditure quantities, social net present value, carbon savings, carbon cost effectiveness and potential employment figures all point to **Option 2 – Blended Public/Private Loan** fund being the most effective way to invest public funding.

PART 2: FUND MANAGEMENT & DELIVERY OPTIONS

9 CRITICAL SUCCESS FACTORS FOR THE DELIVERY OPTIONS

9.1 Delivery objectives

9.1.1 The project has identified a number of critical factors for delivery that must be achieved for both the success of an initial loan fund, and the potential ongoing utilization of the initial setup for future iterations of the loan scheme. The objectives are set out as follows (and explored in more detail in the Legal Report:

- Facilitate blend of public/private finance
- Minimise burden on investors by creating a suitable management profile
- Maintain flexibility for further iterations of fund.

Table 25 - Fund Manager Critical Success Factors

	CRITICAL SUCCESS FACTORS
1	**Blend of Public/Private Finance** The fund as specified by the project brief must be set up in a way that facilitates a mixed blend of finance sourced from both the Public and Private sectors. The inclusion of public finance is intended to motivate the resourcing of finance from the private sector by reducing overall risk to the fund and demonstrating public commitment to the fund's overall intended objectives. The fund must also consider the roles that each potential investor can play.
2	**Suitable Management Profile** Given the inclusion of both Public and Private finance, the fund must have a management structure which does not place undue burden on either the private finance investors or the public finance investors. The regulatory requirements for management of a fund of this type are discussed in the Commercial Case, and the initial setup must ensure that all of these financial and regulatory requirements are satisfied. However, it is unlikely that the investors themselves will be able or willing to satisfy these requirements, so suitable, accountable management must be established to meet these requirements. As the fund is intended to blend both Public and Private finance, we recommend that the fund management is undertaken by an appointed third party that can meet these requirements, rather than being run by a public body.
3	**Future flexibility** The fund itself is intended to be a pilot scheme demonstrating the feasibility of setting up and managing a loan fund with finance sourced from both public and private sector investors. The initial targeting and overall value of the loan scheme, once demonstrated, may require or invite further use or change to address different consumer sectors or attract different blending of finance. The initial pilot scheme must therefore be set up in a way that is suitably robust and flexible to allow the potential re-focus and expand/contract it's lending portfolio if deemed necessary.

10 SHORTLIST OF DELIVERY OPTIONS

10.1 Introducing the Delivery Options

10.1.1 In order to meet the critical success factors for loan fund delivery, we have assessed the viability of the proposed loan fund through the appraisal of the most viable fund management option. The key consideration is to determine the best option that secures the Combined Authority's policy objectives and motivates private sector participation.

10.1.2 There are 3 legal structures typically used for Fund Management (also set out with initial analysis in Table 26 - Comparison of Fund Structures), and which form the main options for this appraisal:

- Option 1: Company Limited by Shares
- Option 2: Company Limited by Guarantee
- Option 3: Limited Partnership

10.2 Option 1: Company Limited by Shares (CLS)

10.2.1 Company Limited by Shares is a legal entity that separates itself from its shareholders and other members. This separation allows it to enter into contracts, trade assets and conduct business in its own name, whilst protecting the shareholders' personal assets. Its limited liability means that each shareholder is only responsible for the company's debts and liabilities up to the value of their shares in the company.

10.3 Option 2: Company Limited by Guarantee (CLG)

10.3.1 Unlike CLS, Company Limited by Guarantee is an entity formed by individuals or corporate entities who agree to pay a fixed amount of money in the event of default, hence effectively becoming guarantors of the company. Each of their liability is limited to the nominal amount of money that they guarantee. Just like shareholders in CLS, these guarantors are involved in decision-making of the company. Importantly, however, CLG cannot distribute its profit to the guarantors, but use it up within the purpose of its business.

10.4 Option 3: Limited Partnership (LP)

10.4.1 Limited partnership is a business association made up of general partner(s) and limited partner(s). Limited partners' liabilities are limited to the amount of their investment made into the LP, whilst the general partner assumes the full liability in the event of default.

10.5 Other Options

10.5.1 Additionally, two further delivery structures may be possible (Limited Liability Partnership (LLPs); and Private Fund Limited Partnership (PFLPs)). However, these further structures were discounted from further consideration, due to the following factors:

10.5.2 LLP is a viable option with similar advantages as those of LP, especially when it comes to tax efficiency and flexibility of the structure to allow constitutional arrangements and protection of personal liability. In fact, in many occasions the general partner of a limited partnership

sets themselves up as an LLP for the protection of their personal assets from the business liabilities. However, the LLP is discounted early on due to the fact that there is no general partner in the structure. Instead, its limited partners need to share the management of the business. This feature or limitation contradicts the key objective of our fund, namely the mobilisation of private investors with patient capital deployed for passive investment. Therefore, Limited Partner is preferred in comparison with other legal structures.

10.5.3 Another noteworthy structure is a PFLP. This has been an increasingly popular option for funds (e.g. GLA's MEEF), as it has reduced disclosure and administrative requirements. However, this option, too, is discounted from our list because PFLPs are not allowed to carry out marketing activities to retail customers, which we expect a fund manager will wish to participate in, or maintain control of, and we have factored in specific budget for this under our financial assumptions.

11 ECONOMIC APPRAISAL OF THE DELIVERY OPTIONS

11.1.1 In this section, the economic benefits of delivery options are assessed based on three factors. First, the economics, particularly the setup and operating costs elements, are evaluated. Second, it is assessed how the delivery options are aligned with private investor interest. This includes factors like, profitability, tax efficiency, governance and predictability. Last, the financial interest and level of competition between private investors is evaluated.

11.2 Setup and running costs

11.2.1 From a cost perspective, Limited Partnership was found to be the most efficient. With an assigned management committee, a LP is not managed by shareholders, resulting in lower administrative and legal burden. As CLG and CLS both involve more complicated ownership, governance structure and due diligence requirements, the setup of the fund has more administrative requirement and compliance with FCA permissions. The fact that the structure of Limited Partnerships is simpler, involving lower risk of conflict of interest, translates into lower compliance costs and generally lower setup and fund running costs.

11.3 Alignment with private investor interest

11.3.1 The benefit appraisal also found that LP aligns the best with investor interest. This is due to competitive advantage in (1) profitability, (2) tax efficiency, (3) governance structure and (4) predictability.

(1) In LP, limited and general partners agree on the profit distribution structure prior to setting up the partnership. As profit cannot be distributed in a CLG, a CLG would only be attractive to NGOs and charities, not private investors.

(2) LP is considered more tax efficient as, in contrast to CLS, it is not taxed at a corporate level. Instead, profits and losses can be reported on individuals' tax returns, i.e. by the investor (whether individual or corporate). CLG could also be more suitable from a tax perspective as it may be entitled to tax benefits.

(3) The governance structure of LP is more suitable to the fund compared to CLS and CLG. This is because a management committee is in charge of the LP, with no investors being directly involved in the governance of the partnership. Limited involvement in LP's management is expected to be highly attractive to private investors who are seeking 'passive' investment opportunities. As the governance structure is simpler and clearly set out in the Limited Partnership Agreement (LPA), the risk of conflict of interest is also generally lower compared to the two alternatives.

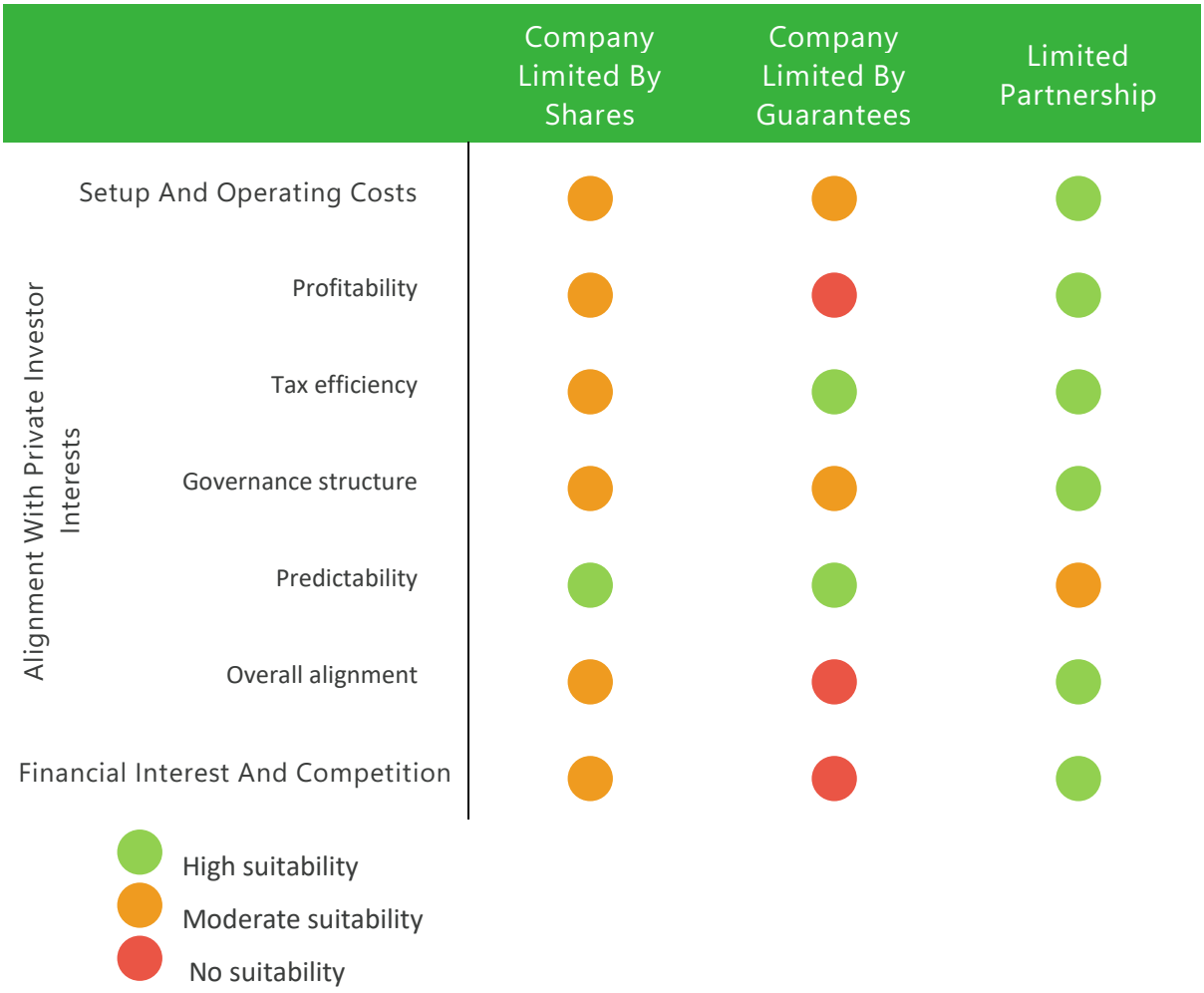
(4) However, LP is found to be less 'predictable' than CLS and CLG as the withdrawal or death of the general partner could lead to the dissolution of the partnership. This is not the case for CLS and CLG in which would remain unaffected in such circumstances,

11.3.2 Given the advantages detailed above, Limited Partnership is the most attractive delivery option, and hence, can stimulate considerable competition between private investors. Competition and attractiveness of the fund are key to increase the share of private capital in

the blended fund over time. Table 26 compares the three delivery options based on these factors.

11.3.3 These factors also align with the Critical Success Factors established at the start of this section: facilitating and providing an attractive structure for both public and private finance, creating an efficient fund management profile by the appointment of a General Partner under the Limited Partnership route, and maintaining suitable flexibility for potential future iterations of the scheme.

Table 26 - Comparison of Fund Structures



12 BENEFITS APPRAISAL OF THE DELIVERY OPTIONS

12.1 Limited Liability of Members

12.1.1 All three legal structures offer some degree of protection for its members. In CLS and CLG, all the members are protected from risking their personal assets. Their liability exposure is limited to the extent of their shares (CLS) or their guarantee portions (CLG). This is also true in LP. The limited partners are only liable for the partnership's debts and liabilities up to the total amount of their investments.

12.1.2 This limitation of liability, however, poses different nuanced implications. In CLS, the shareholders potentially face risk of conflict of interests. As the ownership of the company is determined by shares, a shareholder with a significant number of shares may exercise control over other shareholders and the management of the business, resulting in loss of control on the part of minority shareholders. Similarly, the stakeholders who provide guarantees in a CLG make decisions about the company and can face difficulty in balancing the interests of different members. Whereas, in LP, the limited partners have limited control over the fund activities and investment decisions. Instead, they may participate in the fund's governance through a management committee. It is the general partner, who assumes the unlimited liability of the fund, and who is also assigned with fund activities and investment decisions.

12.1.3 This difference in management/control means that the members in CLS and CLG are required to participate in the management of the company, whereas LP will offer freedom and efficiency to its limited partners with regard to fund management. Hence, LP is often seen by private sector investors the preferred option.

12.2 Capital Raising

12.2.1 CLG is not a suitable option in this regard. As the profit cannot be distributed to its guarantors, it effectively becomes less attractive to investors from private sector. It may, however, have more advantage in attracting public grants or funding from charities and foundations.

12.2.2 Both CLS and LP are attractive forms of structure with regard to raising capital for the business. In CLS, the company can attract investors as its ownership is clearly set out by shares. CLSs can also access the capital market and raise their capital through IPO or public fundraising. In LPs, passive investors are excepted from management and other duties, contrary to CLS or CLG And the process of becoming a limited partner is simple and efficient. These allow private investors freedom and flexibility.

12.3 Governance and Management

12.3.1 All three structures provide viability to run a fund. A CLS or CLG will have a clearly defined board of directors (or trustees, in the case of a charitable CLG) and may appoint executives to run the business. Limited partners, on the other hand, will have very limited or no control over the partnership's fund and investment activity. This makes the management of the fund easier and more efficient than other structures. An exception is when there is more than one

general partner, which can lead to a more complex structure, governance and management (which is not envisaged in the context of this scheme).

12.3.2 Regardless of their legal structure, the company will need to have or appoint someone with necessary expertise to run the given fund. This is especially true in the case of limited partnership where limited partners are distanced from management. Therefore the general partner is often an entity of a management company who possesses the right skills and experience.

12.4 Profit Distribution and Taxation

12.4.1 Limited Partnership is often considered favourable by private investors due to its flexibility in relation to profit distribution. Limited partners and general partners can agree on profit sharing mechanism and structure, and set this out in a Limited Partnership Agreement (LPA) where the details are stipulated. In addition to profit distribution, perhaps one of the best known advantages of limited partnership is tax efficiency. In many jurisdictions, the income earned by an LP is typically "pass-through" income, which means it is not taxed at the entity level. Instead, profits and losses are reported on the partners' individual tax returns. This can lead to tax advantages, especially for limited partners.

12.4.2 On the contrary, profit in CLS is taxed at a corporate level, before it is distributed to its shareholders where further dividend or income tax will be applicable. Therefore it has a less advantage compared to LP. CLG is not a viable option in this regard, as profit cannot be distributed to its guarantors but re-used in the business (but CLG may be entitled to tax benefit).

12.5 Formation, Duration and Other Considerations

12.5.1 CLS and CLG are generally considered as involving more administrative and legal requirements, hence more costly, when it is set up (e.g. Companies House requirements, legal and accountancy costs). Whereas, setting up an LP is simpler and cost-effective (i.e. LPs are exempt certain public disclosures).

12.5.2 CLS and CLG can have perpetual existence, even after shareholders/guarantors change or pass away. LP, on the other hand, usually has a fixed tenure of its operation after which it ceases to exist. In some jurisdictions, the death or withdrawal of the general partner can trigger the dissolution of the partnership unless the LPA specifies otherwise.

12.5.3 In terms of privacy, the LP structure provides greater privacy for its investors than CLS or CLG where there are usually more public disclosure requirements.

12.6 Benefits Summary of the Delivery Options

12.6.1 The various components of economic and benefit factors suggest that limited Partnership is the best form for the proposed loan fund. It is because the Pilot Loan Fund's key objectives include mobilisation of the private sector. In order to motivate and incentivise private investors, the fund structure should be easy to set up for investors, allows freedom and flexibility for them, and commercially viable. LP stands out in this regard.

13 RISK ASSESSMENT OF THE DELIVERY OPTIONS

13.1 Risk assessment of Delivery options

13.1.1 Although benefits of LP outweigh the other two options, CLS and CLG, it comes with potential risks that need to be tested.

13.1.2 In the LP structure, limited partners (who are effectively investors) are restricted from management of the fund. This poses a general partner risk, i.e. that the chosen general partner may not have the necessary expertise to manage the fund and/or lack integrity which may cause misconduct and hence result in reputational or other risks. Furthermore, if there is more than one general partner in the partnership, this can cause risk in management of the fund.

13.1.3 As a solution to these risks, it is important to keep the structure of the fund simple. The proposed retrofit loan fund only requires a simple fund structure where the Combined Authority and possibly DESNZ may be appointed as limited partners, together with private investors. The partnership will not necessarily require more than one general partner who may be an entity of an investment firm.

13.1.4 It is also important that the selected investment firm, who will effectively become the fund manager of the proposed fund, will need to have expertise in the areas of retrofit and fund management. This is set-out in more detail in the Commercial Case (specifically, sections 15.1, 15.2, 16.2).

13.1.5 Risks associated with CLS and CLG are more substantial. CLG is not a viable option, because many of its features are commercially unattractive and are unlikely to motivate private investors to participate. In CLS, one major risk is that an investor with a significant size of shares can affect the management and decision-making of the fund. Any potential conflict of interests will be costly and may lead to a material, negative impact on the success of the fund. The suitable investor profile for the proposed retrofit loan fund may be investors with low-risk appetite who may passively invest in the fund and for a longer tenor. Moreover, there is risk of inefficiency in the profit distribution, as profit will be taxed at the corporate level before it is distributed to investors.

14 PREFERRED OPTION (FUND MANAGEMENT / DELIVERY OPTION)

14.1.1 Our analysis on the benefits and risks associated with each of the three legal structures – CLS, CLG and LP – suggests that **Limited Partnership** is the most suitable structure for the ATP retrofit loan fund. Limited Partnership offers limited liability to investors. It enables the fund to attract and raise private capital, and provides an effective form for fund management and governance. In addition, profit distribution and taxation are most efficiently achieved in favour of investors, its formation is cost-efficient and it offers privacy to its partners. It offers flexibility by design in that each Limited Partner (private, public, non-profit, etc.) will come to the fund with their own requirements, and, therefore, a specific Limited Partner Agreement tailored to suit their investment and their required returns. It comes with risks that need to be mitigated and managed, as set out above.

COMMERCIAL CASE

15 COMMERCIAL VIABILITY

15.1 Market Availability

15.1.1 The scheme will be made-up of two distinct and separate activities in respect of the UK financial services legal and regulatory landscape, namely:

1. Collective investment (and the associated management of the fund/investment) - known as "***Fund Management***", hereafter; and
2. Consumer lending (in the form of lending to householders) - known as "***Consumer Credit Lending***", hereafter.

15.1.2 At a simple level, this could be seen as equivalent or similar to a bank, where monies are deposited on specific terms by investors and the monies are in turn lent to third parties under specific terms. Given the scale of the regulatory requirements covering banking activities it will be important to ensure that the scheme does not appear or act in the same way as a bank. Specifically, the fund and the associated Fund Management activity should operate as either a Collective Investment Scheme or as an Alternative Investment Fund, each of which has specific regulatory requirements, although there is overlap within the regulatory landscape. Separately, the Consumer Credit Lending aspect of the fund is subject to a different set of regulatory requirements.

15.1.3 Legal advice has suggested that it is unusual for a person/organisation with the full suite of regulatory permissions relevant to fund management to also have the full suite of permissions in relation to consumer credit lending. Therefore, the General Partner (acting in a capacity of Fund Management) is unlikely to be able to be the same vehicle that will undertake consumer credit lending. The advice goes on to say that, while this is technically, or at least hypothetically, possible, it is unlikely that the newly created vehicle would meet the regulatory requirements to be authorised in respect of such activities. As such, the scheme will need to consider carefully the potential need to involve both a fund manager ***and*** a consumer credit lender in addition to the fund vehicle itself, and take into account the relevant fees across each element of the scheme. These fees are set out in detail in the Financial Case.

15.1.4 In addition, consumer credit broking may be required to support the scheme, although this will be considered separately once the Fund Management and Consumer Credit Lending arrangements are further understood and agreed in principle. In addition, it is unlikely that the scheme will actively procure commercial credit broking services, instead relying on the existing network of combined and local authorities: however, this assumption will need to be tested with participating public sector actors.

15.1.5 At this stage it is not possible to establish the specific form for the Fund Management aspect of the scheme as there are a number of questions still be answered and understood.

Specifically, these include (some elements are considered further within the Management Case):

1. The role (if any) of each of the Combined Authority, SWNZH and DESNZ within the Limited Partnership;
2. Whether the Combined Authority, SWNZH, DESNZ and/or other stakeholders will be investors into the fund;
3. The requirements of the investors (both public and private);
4. Whether and how monies, including interest, will be recycled back into the scheme (this is partly discussed within the Financial Case);

15.1.6 Notwithstanding the structure of the Fund Management arrangements, an examination of the Financial Conduct Authority (FCA) register[66] provides confidence that there are significant numbers of Alternative Investment Fund Managers and organisations regulated to operate Collective Investment Schemes. Therefore, Fund Management capacity within the market is likely to be sufficient to meet the needs of the scheme.

15.1.7 In respect of Consumer Credit Lending, as above, the (FCA) register provides confidence that there are significant numbers of organisations authorised with full permissions to provide Consumer Credit Lending services. Therefore, Consumer Credit Lending capacity within the market is likely to be sufficient to meet the needs of the scheme.

15.1.8 To note, the concept of an Appointed Representative (AR) has been considered in an attempt to simplify the operational arrangements and streamline the number of actors involved in the delivery of the scheme, however, the legal advice states that the viability of such an arrangement is significantly reduced due to the limitations imposed on such arrangements, e.g. an inability for an AR to lend where interest is charged.

15.2 Market Capability

15.2.1 In terms of the capability of the market, it is less clear whether the organisations identified within the FCA Register (see 15.1.6 and 15.1.7, above) have the specific capabilities to fulfil the requirements of the scheme. It will, therefore, be necessary to undertake some light-touch market engagement activities to ascertain the wider capability of the market once the Fund Management and Consumer Credit Lending requirements are further developed. Such capability should include experience of the marketplace in which the scheme will operate, namely energy efficiency, householder borrowing, public-private investment, etc.

15.3 Attracting Investment

15.3.1 In the wider electrification and decarbonisation sectors, in 2022 a total of US$285Billion (~€265Billion; ~£227Billion) has been invested in energy efficiency and electrification solutions, having steadily increased year on year for the last 5 years[67]. However, there is a concern that investment and funding will diminish globally in both public and private sectors

[66] Link to FCA Register
[67] IEA - World Energy Investment 2023 (WEI 2023) report

due to increased borrowing costs and the winding down of post-pandemic incentives and fiscal stimuli. The need for private sector participation in the energy efficiency sector is imperative to accomplish the scale and speed of retrofit required.

15.3.2 Globally, the private fund market is facing challenges due to the current economic uncertainty. Limited Partnerships are having to rebalance their portfolios affected by the high inflationary and high interest rate environments. As a result, investors are likely to turn to low-risk assets to navigate through this uncertainty. Investors are increasingly turning to alternative asset classes, including infrastructure, and growth in this area has been steady during the past decade.

15.3.3 Investment in energy efficiency is likely to provide a competitive advantage in an uncertain market and it is far less affected by the fluctuating short-term market conditions. Whilst the level of returns is perceived to be lower than other assets, home retrofit loans have provided a very low default rate, therefore, investing in energy efficiency will provide investors a steady income stream.

15.3.4 It is recognised that the use of capital markets and commercial finance is at an early stage in this space, and the IEA report (referenced in 15.3.1 above) states that private sector involvement "*will have to play an increasing role in providing access to larger pools of finance for energy efficiency investments*."

15.4 Commercial Principles

Fund Investment

15.4.1 The identity and individual requirements of each investor will in part dictate the way in which the fund is managed (i.e. what happens with the investment once received from the investor). However, shaping the downstream nature of the fund now, will make the fund more attractive to some investors, as well as deterring others: no fund will appeal to all potential investors in the same way. For example, if the ATPR Fund wishes to offer loans to homeowners that can be repaid at any time without penalty, that may deter investors who are expecting their money to be invested for a set period, with a set return on investment over that time period. Conversely, early repayment without penalty will appeal to homeowners and may be acceptable to other investors. Therefore, if the Combined Authority, SWNZH and/or DESNZ have certain other investors in mind, it will be important to ensure any such investors are consulted early in the process so that the features of the Fund can be shaped to appeal to those investors or to discard investors where their requirements do not align with the broader features of the Fund.

15.4.2 A key principle for investment is that the fund arrangements should permit each investor the flexibility to contribute to the ATPR Fund in the most efficient manner, and in a way that ultimately helps achieve the policy objective (i.e. the roll-out of energy efficiency measures). Fundamentally, all investors need to be treated fairly, although they may not all be treated identically: each investor will have its own requirements, constraints, and flexibilities. This will be facilitated via the individual Limited Partner Agreements between the General Partner and each Limited Partner, setting out the terms and conditions of the Limited Partner's

involvement in the scheme. Each LPA will be confidential between the Limited Partner and the General Partner.

15.4.3 A critical question to answer is what role DESNZ will play in providing investment into the fund, and whether it will do this directly (as a Partner/Investor) or whether it will do this via the Combined Authority and/or via another Limited Partner. It is understood that the Combined Authority's expectations are that DESNZ should invest directly into the Fund: this will need to be tested with DESNZ, but alternatives to this assumption are also viable. In addition, DESNZ will need to consider the precise nature of how it invests the public sector portion of the Loan Fund, the nature of the investment (e.g. Capital, Grant, zero-interest loan or minimal interest loan), and the timing (all at once, in stages, etc.), plus whether any such staging is conditional on other Investments (e.g. crowding in other Investors) and/or take-up of the scheme.

15.4.4 A key question to understand is what happens to loans that have been repaid by the Homeowners – how, when and in what form is it envisaged that they are returned to the investors. Specifically:

- where recycling of repayments is undertaken, it will need to be established whether this applies to only the capital repayment (with interest payments being channelled back to the Investors) or whether interest is also subject to recycling.
- Returns to investors will depend on how the Fund has been established, the requirements of each investor, as set-out in each LPA, and which could be in the form of, for example, dividends (where there are shareholders), interest payments and/or repayment of capital.

15.4.5 In terms of establishing the Fund, it is important to consider the different ways in which funding can be invested. In respect of a Limited Partnership we have considered three (3) distinct methods:

i. Grant Funding;

ii. Unsecured Pari Passu Investment repayable to Investors equally; and

iii. Loans with a Set Repayment Schedule.

15.4.6 To note: we have discounted the option of Equity Injection as this would only be relevant where the legal form is a Company Limited by Shares (CLS), which is not the Preferred Option.

15.4.7 **i Grant Funding**: It is assumed that this option will not be pursued as it is not clear what would happen to the capital once the Loan fund is wound up. In lieu of a Grant, a zero-interest Loan may be more appropriate ..

15.4.8 **ii Unsecured Pari Passu Investment**: in this case the investment is repayable to Investors equally, as and when funds are available, after the Fund has recycled any repayments from existing Homeowners into support for new Homeowners (as appropriate), and otherwise covered its cost base (effectively the repayment is the amount of "distributable profits" akin to dividends).

- It can apply to the Fund regardless of its legal form and in combination with all other forms of investment.
- It is likely to appeal to patient investors, particularly those from the public sector who do wish to have their capital returned but have no set or short-term deadline for this.
- Financial modelling and private sector investor engagements lead to a mechanism whereby the public sector will commit their investment first and receive their capital and distributable profits after the private investors have received theirs. (See Sections 19.6.10 and 19.6.11 below for more detailed information.)

15.4.9 **iii Loans with a Set Repayment Schedule** (varying seniority and security): in this case there are a number of variations, depending on the requirements of the Investor.

a) Unsecured Loan – essentially this form of investment would take precedent over ii (Unsecured Pari Passu Investment) due to the requirement to have a repayment schedule in place. This form of investment can apply to the proposed Fund structure and in combination with other investment. Investors requiring a steady repayment of their investment would select this type of option. The timing of any repayments would need to occur once the first Homeowners have repaid their loans (i.e. an initial payment holiday would be required at the start of the loan period). This type of investment potentially erodes the availability of recycled funds and may delay the repayment to Investors in category ii. Although this approach is feasible for private sector investors, taking on this type of debt (i.e. a loan product) would require further consideration as to the ramifications of the Limited Partnership itself taking on such debt (e.g. management, marketability). Taking on this type of debt would also be more suited to the legal form of a CLS.

b) Senior Debt (institutional investors) – this is similar to a), where the Investor(s) in this category take precedent over all other Investors and Investments (i.e. it is the most senior), plus the investment is often secured against the Fund's assets (which is the main benefit of this type of investment – leverage from senior lenders requiring security). The more common legal form for the Fund containing this type of Investment is CLS, therefore, it is less likely that this form of investment would be attractive to this Fund given that the Limited Partnership legal form is preferred.

15.4.10 In terms of the timings for investors injecting funds into the scheme, it is likely that this will occur in tranches, as and when funds are required for Homeowner loans. This may present financial challenges in respect of the following:

a) For non-zero interest loans or investments, interest will accrue as a cost to the Fund, irrespective as to whether the injected funds have been deployed as Homeowner Loans;

b) Conversely, tranches of investment may only be called upon when a reasonable number of Homeowners have shown interest in the product, potentially delaying the deployment to Homeowners;

c) Committing (some) investors to reserve funds for future drawdown may attract a reservation fee that will need to be taken into account in any future modelling, and, therefore, further consideration will need to be made as to the size and duration of any

reserved funds. For example, additional rounds of fundraising could be undertaken later in lifetime the scheme to reduce such fees, with the risk that the future "cost" of later investments would be unknown.

15.4.11 For the purposes of the pilot stage of the Fund, it is assumed that all funds are held in the same account, however, different classes of Fund may be required, particularly if or as the scheme is expanded beyond the pilot stage. Some examples include:

a) Some investors may have very specific or more onerous terms, compared to other investors. For example, they may require a particular level of creditworthiness in order for homeowners to utilise their funds, even though the Fund is generally focussed on all those who are able to pay. Such investors may be useful to have on board (rather than losing the investment) in order to ensure the fund is sufficiently geared for different "classes" of Homeowner;

b) Some investors may require that their funds are invested in a particular ratio to the funds of other investors in order to spread their risk across the whole of the Loan Book. This is sometimes known a matched-funding.

Fund Management

15.4.12 The proposed ATP loan fund seeks to maximise impact within the policy objectives of the Combined Authority. The pilot fund targets homeowners who are able to repay a loan, plus the agreed level of interest, borrowed for the purpose of retrofitting their houses. The Fund Manager, in conjunction with the Consumer Credit Lender, should be capable of running the fund in the interest of maximising returns to investors.

15.4.13 The fund's proposed legal structure is Limited Partnership. This means that the selected Fund Manager would be appointed as the Manager, and to act on behalf of the general partner to operate the Fund. The General Partner will enter into Limited Partnership Agreements (LPA) with investors, which will include setting out the arrangements of the Fund Manager in this regard. The Fund Manager will require the necessary skills to manage the fund in this type of structure. In addition, the Fund Manager will likely possess knowledge and experience in retrofit as well as experience of working with Consumer Credit Lending organisations dealing with consumer credit loan books.

Consumer Credit Lending (Loan Management)

15.4.14 The Consumer Credit Lender should have experience in delivering consumer credit to homeowners, implementing and managing a Loan book, and understand and have experience of the retrofit marketplace.

15.4.15 Each Homeowner (jointly and severally, i.e. all owners of the property) will be offered a personal loan at a fixed rate of interest over a fixed period of time. Monthly repayments will commence as soon as the loan is drawn down following the installation of the retrofit measures.

15.4.16 Where Homeowners elect to sell on their property prior to repaying the whole of the loan, further consideration is required as to how this is to be managed within the scheme. The

assumption is that the installed measures remain with the property for the benefit of the new Homeowner. There are, therefore, a number of possible options available:

1. Transfer the balance of the Loan from the selling Homeowner to the buying Homeowner. This would require some form of novation and may require additional credit checks and potentially, an application or transfer process to be invoked by the buying or selling Homeowner, respectively. This could be managed via the conveyancing process.
2. The selling Homeowner repays the balance of the loan from the proceeds of the sale (this could be via a premium on the property's sale price, for example, although this would be a commercial decision for the buyer/seller), meaning that the buying Homeowner has full benefit of the retrofit measures on completion. The only requirement from the Fund's perspective would be to invoke an early repayment action, including any early repayment charges. This is the option that has been assumed as normal operation in the financial modelling.

15.4.17 Following on from the transfer of property, further consideration is required in respect of any restrictions that may be required to protect the Lender from credit risk and/or loan default, and to ensure the Loan is managed appropriately in respect of a sale by or the death of the Homeowner. It is currently understood that a fixed charge over an asset, or any mortgage over the property are not currently envisaged, although some form of title restriction may be appropriate. Title Restriction is an approach currently undertaken by Consumer Credit Lenders in this sector.

FCA Authorisation

15.4.18 Operating in the UK, both the Fund Manager and the Consumer Credit Lender will need to be fully compliant with all the relevant requirements and permissions necessary to operate, as set out within the respective legislative frameworks and as managed and authorised by the Financial Conduct Authority.

16 PROCUREMENT APPROACH

16.1 Procurement Strategy

16.1.1 As set-out in section 15.1 above, there is known capacity in the market to provide the services, therefore, in order to demonstrate best value in terms of the proposed services, it will be necessary to undertake an open and fully competitive procurement.

16.1.2 This section 16.1 concerns the elements of the service that will need to be formally procured. In this context, Investor acquisition is dealt within the Economic Case (section 14.1.1).

16.1.3 Recent Gemserv experience in working with the British Business Bank (the Bank) to procure certain financial services to support the Bank's Start Up Loans scheme, suggests there are no existing frameworks or similar for the types of services that will need to be procured for this scheme. Therefore, given that this will be a publicly managed and partially publicly funded scheme, a procurement that utilises the Public Contracts Regulations 2015, or the successor legislation that is due to come into force in the latter part of 2024 (Procurement Act 2023), depending upon the procurement's timing, will be required.

16.1.4 There are two primary sets of services to be procured: a Fund Manager and a Consumer Credit Lender, each a distinct service and, as set-out in 15.1.3 above, it is very unlikely that, due to the regulatory landscape, both of these services could be provided by the same entity. Therefore, it is proposed that each primary service should be procured independently from the other. This could manifest itself in one of the following options:

i. Procure the Fund Manager first, then procure the Consumer Credit Lender with input and support from the Fund Manager. This may provide the procuring authority with additional input and considerations from the specialist, particularly where the Fund Manager has experience and expertise in this area (which could be a requirement of the service). In addition, it will enable the Fund Manager to secure the necessary private sector investors for the fund whilst the Consumer Credit Lender is being procured. Conversely, the overall procurement would take longer to secure the services of the Consumer Credit Lender and could delay the commencement overall service.

ii. There is a variation of Option i: Procure the primary services as a single package, where the Fund Manager is effectively the key contractor and is instructed to procure/sub-contract the Consumer Credit Lender as part of their overall service. This variation of option i would require further input from a regulatory legal specialist to ascertain its legality and whether this single package would be acceptable in the regulatory context, including any specific aspects that would need to be put in place to minimise risk;

iii. Commence the procurement of the Fund Manager, then stagger/slightly delay the commencement of the procurement for the Consumer Credit Lender to enable the Fund Manager to secure the necessary private sector investors for the fund whilst the Consumer Credit Lender is being procured / mobilised. The main advantage for this approach would be to free-up the procuring authority resources to focus on the Fund Manager procurement first and then at a prescribed point, move on to the Consumer Credit Lender procurement part-way through the Fund Management procurement -

paying particular attention to the careful planning the overall tender period: tender preparation, management, tender evaluation, governance and contracting;

iv. Commence the procurement of the Fund Manager and the Consumer Credit Lender at the same time, using the same procurement vehicle and procedure. This would mean that each primary service would be procured under separate lots, but managed under the same procurement notice and generally following the same timeframes, meaning that the procurement administration could be somewhat streamlined once the procurement is launched. What this would mean, however, is that both elements of the procurement (i.e. the procurement paperwork for the two separate Lots for each of the primary services) would need to be ready in time to launch the procurement. This could place a high burden of work on the client team in respect of developing and preparing the tender materials and associated documentation for both services, albeit a limited number of elements will be common across both sets of primary services. In addition, the same procurement procedure would need to be used for both services, potentially removing some procurement procedure flexibility.

16.1.5 The procurement procedure(s) that is to be used for the primary services will determine the extent to which the tender materials will need to be developed (see Appendix [4]: summary of **Gemserv's Public Procurement: Decision Framework**, which is an enabler to assist public sector organisations select the most appropriate procurement procedure under the current Public Contracts Regulations 2015). A procurement procedure for this scheme cannot yet be proposed until the commercial strategy for the scheme and the associated commercial requirements for the Fund Manager and Consumer Credit Lender are further developed.

16.2 Service Requirements

Fund Management

16.2.1 As set-out within the Commercial Principles (section 15.4 above), the Fund Manager is required to operate the Fund to secure sufficient investments to operate the scheme, manage the availability of the investments for lending, liaise with the Consumer Credit Lender to manage the pipeline of Loans and the respective loan repayments back into the fund, oversee any recycling of funds, and manage the distribution of returns to the investors. The Fund Manager may also be responsible for winding-up the Fund when it reaches its natural conclusion.

16.2.2 The Fund Manager must have the necessary permissions from the FCA to operate as a Fund Manager.

16.2.3 The Fund Manager must have experience of operating on behalf of the General Partner within a Limited Partnership arrangement.

16.2.4 The Fund Manager must have competent staff, in sufficient capacity to manage the fund effectively and deliver the necessary services.

16.2.5 The Fund Manager must have experience of managing a Fund of this type, be knowledgeable in the retrofit / energy efficiency marketplace, and have operated in

combination with a regulated Consumer Credit Lending organisation dealing with the retail lending (Homeowner) market.

Consumer Credit Lending

16.2.6 The Consumer Credit Lender will be required to: process loan applications; approve or reject loans inline with FCA regulations and client standards; issue loan paperwork; administer the loan book (collections, arrears management, customer contact management, repayments, etc.); debt recovery and enforcement; and essentially support the Fund Manager to generate a return for the investors.

16.2.7 The Consumer Credit Lender must have the necessary permissions from the FCA to operate as a Consumer Credit Lender.

16.2.8 The Consumer Credit Lender must have experience of the retrofit / energy efficiency marketplace.

16.2.9 The Consumer Credit Lender must have competent staff, in sufficient capacity to deliver the necessary lending and loan management services.

16.2.10 The Consumer Credit Lender must have experience of working with a dedicated fund and the associated Fund Manager, that has been established to provide Loan products to the Homeowner market only.

Other Legal Requirements

16.2.11 Depending upon how the Fund Manager / Consumer Credit Lender arrangements are set-up, the "Fund" will be handling personal data for the Homeowners, therefore, one or both organisations will be subject to the applicable data protection laws, such as UK GDPR and Data Protection Act 2018.

16.3 Apportionment of Risk

16.3.1 Risk should be managed where it is most likely to materialise and/or where the impact is greatest, therefore, key risks should be allocated to the organisations best placed manage them. This will apply equally to those risks relating to the procurement of the services, and those risks relating to scheme delivery which can be apportioned to the respective service provider via the service requirements and terms and conditions. In most cases, the risks listed below are set out in more detail elsewhere in this Business Case, including proposed mitigation measures, where these have been developed/considered.

16.3.2 Specifically, in respect of procuring the necessary services, the following key risks should be considered by the procuring authority (Combined Authority/SWNZH/DESNZ):

1. Insufficient interest from the Fund Management market and/or Consumer Credit Lending Market;
2. Lack of credible Fund Managers to manage the Fund and/or a lack of credible Consumer Credit Lenders to deliver Consumer Credit Lending;

16.3.3 Key risks relevant to the Fund Manager:

3. Lack of private-sector funding and/or a lack of commercially attractive investments to make the scheme viable;

16.3.4 Key risks relevant to the Consumer Credit Lender:

4. Higher than anticipated Homeowner loan repayment defaults, leading to lower returns to the investors;
5. Insufficient interest from able to pay Homeowners (this risk could equally reside with the Fund Manager and/or the scheme owner as the mitigant relates to marketing and engagement activities which are likely to be a joint activity across the scheme);

16.3.5 Key risks relevant to the General Partner / Combined Authority / DESNZ, albeit, largely out of scope of the Fund and/or beyond the control of each organisation:

6. Insufficient numbers of suitably qualified retrofit installers to meet the demand of the scheme;
7. Quality of installation of retrofit measures is low and/or the measures installed are not appropriate for the type of property and/or the measures do not deliver the anticipated benefits, leading to reputational damage;

17 PAYMENT AND CHARGING MECHANISM

17.1 Payment and Charging Mechanism – Fund Management

17.1.1 In order to cover the Fund Manager's costs, a fixed annual fee based on the value of the Fund, is the most appropriate, commonplace and attractive method for remunerating the Fund Manager. Actual value(s) of Fund Management Fees are modelled in the Financial Case.

17.1.2 In terms of Fund Management performance measures, it will be necessary to develop service levels and key performance metrics to measure and reward performance and, where appropriate, penalise poor or below par performance.

17.2 Payment and Charging Mechanism – Consumer Credit Lending

17.2.1 In exchange for undertaking all the necessary processing of a Loan application (credit checks, loan paperwork, setting up repayment facilities, processing loans, etc.) the Consumer Credit Lender will receive an administration fee. Further consideration is required as to whether unsuccessful loan applications attract any administration fee, and/or that mechanisms are put in place to mitigate against the risk of fraud in respect of unsuccessful applications where an administration fee is paid.

17.2.2 A Loan cannot be drawn down by the Homeowner until sufficient proof is provided showing that the work is complete. This is likely to be in the form of an invoice from the installation company confirming that the works are complete. Under the current scheme design, the Loan will be issued to the Homeowner who will in turn pay the installation company. It is not envisaged that any alternative contractor payment mechanism will be considered, however, there are examples of supplier financing schemes where the payment is made directly to the supplier from the scheme (e.g. UK Export Finance) to mitigate against the small risk that the Homeowner becomes insolvent between the last credit check and the Loan drawdown. Direct payment would protect installation companies against such a risk, the Homeowner would legally still be the borrower, and it may be more efficient to pay installers directly. This will require further consideration prior to finalising the Consumer Credit Lending arrangements.

17.2.3 Once Loans are active (i.e. drawn down by the Homeowner to fund the retrofit measures), the Consumer Credit Lender will receive a monthly loan management fee to recognise each of the actively managed Loans. This could be an ongoing fixed charge to reflect the incurred overhead in managing the active loans, or it could be charged on a per loan basis – this will need further consideration and will likely require further modelling to establish best value.

17.2.4 In addition, the Consumer Credit Lender may require separate fees to cater for other costs that may be incurred in the course of managing the Loan book. Examples include:

- Collection charges relating to Homeowners who have gone into arrears, but who are not yet be subject to debt collection; and
- Collection charges relating to Homeowners who have gone into arrears, and are subject to debt collection.

17.2.5 Homeowners will be subject to a monthly fixed interest payment and an obligation to repay a proportion of the loan on a monthly basis, both elements collected via a single payment. Homeowner Loan Agreements should not be negotiable, except for the actual amount borrowed and some potential flexibility in the repayment duration (but within a prescribed range).

17.2.6 Where Homeowners wish to repay their Loan early, i.e. before the pre-agreed term of the Loan, they may be subject to an early repayment fee to cover some or all of the interest that would have been due were the Loan to have continued to its agreed term. This should be subject to modelling to ascertain an appropriate fee and/or mechanism for calculating early repayment fees.

17.2.7 In terms of Consumer Credit Lending performance measures, it will be necessary to develop service levels and key performance metrics to measure and reward performance and, where appropriate, penalise poor or below par performance.

FINANCIAL CASE

18 DEVELOPING THE FINANCIAL CASE

18.1 Financial Case Objectives

18.1.1 Specifically, the financial case involves detailed consideration of the funding requirements associated with the proposals (how much funding is required and how will it be sourced), and its affordability or viability (is the project affordable and can it generate financial returns in line with the expectations of funders).

18.1.2 The financial case focusses on analysing and financially illustrating the affordability and funding requirements of the identified preferred case for the scheme – in this case the preferred option is a blended public-private loan scheme, delivered using a Limited Partnership ('LP') structure.

18.1.3 The financial analysis is supported by a financial model, which is provided as an additional supporting document to this Business Case.

18.1.4 Additionally, figures quoted in this financial case are presented as pre-inflation figures.

18.2 Financial modelling and approach to assessing financial implications of the preferred option

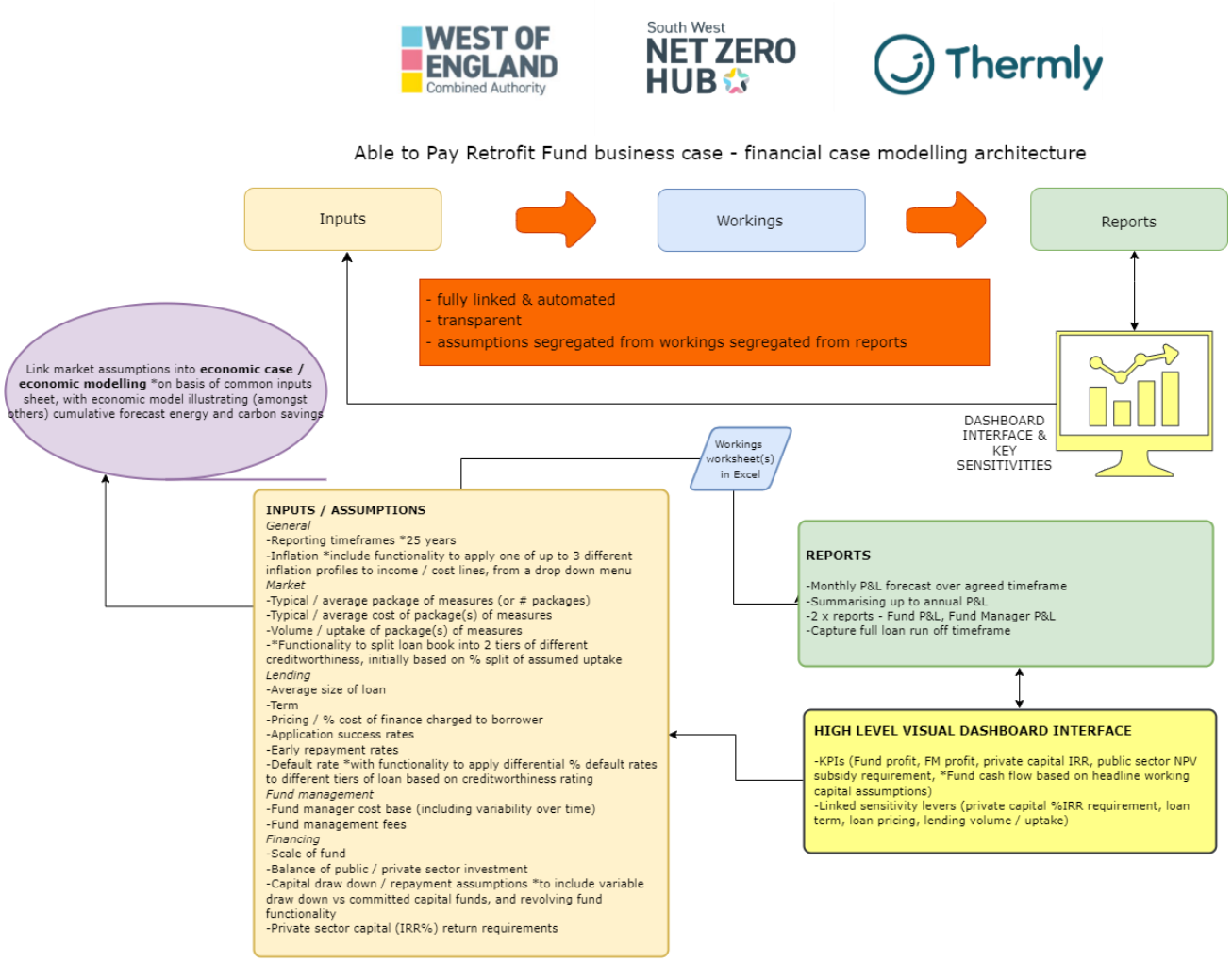
18.2.1 This section details the basis on which the financial model has been. It has been developed specifically for this business case through a process of open debate and discussion between the client and consultant team, as summarised diagrammatically in the model architecture set out below in Figure 12 - Financial Model Mapping Diagram.

18.2.2 The key principles applied to the financial model architecture are:

- Segregated but linked inputs and workings schedules feeding into financial outputs;
- Core financial outputs (profit and loss and cash flow projections) automated and generated on an annual and detailed monthly basis, together with underlying funding schedules illustrating investor cash flow profiles;
- Financial outputs generated in respect of both the ATP Fund and the Fund Manager, given the proposed Limited Partnership structure;
- Modelling over a timeframe of up to 25 years, allowing for both an active lending period and a loan book run off period;
- Explicit integration of the strategic case and market review findings, in the form of a direct read across to the retrofit measures;
- Flexibility around funding structure - in particular, enabling the model to illustrate revolving fund principles and alternative scenarios in relation to the cash flow waterfall, or hierarchy where investor funds are drawn down and subsequently the returns generated back into the Fund are distributed to investors;

- Enabling sensitivity analysis to be carried out on a number of key input assumptions (for instance, loan default rates or pricing of loans to borrowers); and
- Transparent build offering unencumbered access to financial model workings, with no hidden code or macros.

Figure 12 - Financial Model Mapping Diagram



19 FUNDING REQUIREMENTS

19.1 Fund Manager- Financial and funding assumptions

19.1.1 As set out in the Economic Case, the preferred option is a limited partnership. A Fund Manager (FM) will be appointed to manage the fund and, as set out in the Commercial Case, this may be an appointment by the General Partner, to operate the fund on its behalf, or the fund manager may become the general partner.

19.1.2 Whilst the focus of the financial case is the funding and affordability implications of the ATP Fund, it is also necessary to assess the financial viability of the Fund Manager role, essentially addressing the question of how profitable (or not) it would be for an organisation to take on that vital role. In addition, and where relevant, quantifying the extent to which public sector grants or funding may be necessary to support the FM.

19.1.3 The following key assumptions have been made in respect of FM operations within the financial model. Except where specifically mentioned, these assumptions have been based on research and consultations carried out by Amberside, assessing fund management data from a range of investment trusts.

19.2 Fund Management Fees:

19.2.1 The FM is assumed to earn fees from loan activities as per Table 27 - Fund Manager Fees by activity. This recognises the cost to the FM of carrying out loan related activity (checking applicants and loan set up, or loan redemption costs in the case of early repayment), with activity-based fees initially paid through the ATP Fund but then paid on to the FM. Whilst currently modelled as being payable on application, it would be important to agree with the ultimate Fund Manager whether or not that could represent a significant barrier to uptake. If so, an alternative approach - which would have minimal impact on the Fund financial returns given the scale of proposed set up fees - would be to roll the fees into the overall loan, spreading the payment for the homeowner.

Table 27 - Fund Manager Fees by activity

FUND MANAGER FEES BY ACTIVITY	£ TRANCHE A	£ TRANCHE B
Set-up fee £ / successful loan	100	200
Set-up fee £ / unsuccessful loan	100	200
Loan redemption fee £	400	400

19.2.2 Broadly equivalent to a 0.5% charge for Tranche A loans (loans requiring lower due diligence), this is at the mid-point of the researched range of costs, reflecting the proposed public / private blended nature of the ATP Fund. Tranche B loans are assumed in theory to attract a higher set up fee reflecting the fact that they would be loans requiring higher due diligence, it is assumed for financial modelling purposes that this Pilot Loan Fund would offer Tranche A loans only.

19.2.3 Modelled as a separate line, Amberside research also indicates that 1% of the gross Fund size is a good proxy for annual FM management fees – equating to £1m pa for a proposed

£100m ATP Fund. This annual FM management fee is then modelled at a lower level of 0.5% of Gross Fund size in the post lending loan run off phase (when FM costs are expected to be lower).

19.3 Fund Management operating costs:

19.3.1 Annual FM costs during the active lending period are estimated to be as per Table 28.

Table 28 - Pre-inflation Fund Manager Operating Profile

PRE-INFLATION FUND MANAGER OPERATING PROFILE £	STABLE LENDING PHASE
Employee Costs	1,822,825
Mileage Expenses	19,168
Other Travel & Subsistence	19,168
Rent, Rates and Utilities	12,400
Entertainment	1,917
Printing, Stationery & Phones	5,141
Professional Fees	56,250
Marketing	360,000
IT Costs	50,000
Premises Expenses	2,000
Subscriptions, Licences & Training	44,563
Insurance	20,000
Irrecoverable VAT	9,334
FCA Annual Fee	24,000
Total operating costs	**2,446,767**

19.3.2 Viewed in totality as a % of the gross Fund size, these FM operating costs are a little higher than market norms, but this is not unexpected given the Fund is relatively small, and that it will process a high volume of relatively low value loans. Sensitivity analysis has also been conducted on these values later in this Financial Case. A future FM procurement exercise will represent an opportunity to commercially test and refine these cost expectations further against the market.

19.3.3 Typically, the above individual line items were estimated by reference to desk-based analysis of Investment Trusts as part of Amberside's research exercise, with the following key exceptions:

- Given the unusual and relatively labour-intensive nature of the proposed ATP Fund, staff costs have been based on available staff costings for Lendology (as a regionally based loan fund operating in a similar market) at a multiple of X5, given the relative scale of Lendology's annual loan volume and the expected volume of the ATP Fund. It is assumed for financial modelling purposes that this employee cost budget would be sufficient to split out the costs associated for consumer credit lending activities being provided by a separate entity, as set out in the Commercial Case;
- Similarly, annual recurring IT costs have been estimated at a level consistent with Lendology's budget costs, assumed to be reasonable given that organisation's recent

IT upgrades and an expectation that the system can deal with an increase in capacity; and;

- Marketing costs have been included at a deliberately high level - based on research with a marketing agency into a regionally focussed, high impact annual campaign to promote retrofit measures - given the importance of raising awareness and promoting homeowner engagement with the ATP Fund. This is consistent with the findings set out within the Strategic Case.

19.3.4 The above annual costs are assumed to apply consistently throughout the ATP Fund's stable lending phase – which for modelling purposes is assumed to be from 2026 – 2035 as the volume of annual loans issued stabilises. Up until that point, defined as the start up lending phase, employee and related costs are assumed to be lower (estimated 50% of the stable lending phase) as the staff complement is built up over time to deal with peak lending volume. From 2036 onwards, when lending is assumed to close to new loans, and the Fund is thereafter engaged in managing the loan book, employee and related costs are assumed to diminish (estimated to be 25% of the stable lending phase), plus an assumption that no ongoing marketing will be required.

19.4 Financial Implications: Profit and Loss Forecast

19.4.1 The Fund Manager profit and loss forecast over the lifetime of the ATP Fund is summarised in Table 29 - Illustrative Fund Manager Profit and Loss, below. Detailed, year by year forecasts over a 20 year period through the lending period and loan book management period, are presented in Table F1 in the specific 'Report Tables' worksheet within the financial model.

Table 29 - Illustrative Fund Manager Profit and Loss

Illustrative Fund Manager P & L - Expenditure	£'000
Employee Costs	29,939
Mileage Expenses	315
Other Travel & Subsistence	315
Rent, Rates and Utilities	398
Entertainment	31
Printing, Stationery & Phones	112
Professional Fees	1,228
Marketing	4,531
IT Costs	1,607
Premises Expenses	64
Subscriptions, Licences & Training	973
Insurance	643
Irrecoverable VAT	135
FCA Annual Fee	771
Total operating expenditure	41,063
Illustrative Fund Manager P & L - Income	**£'000**
Fund Manager fees earned from loans	2,071
Other Management Fees	15,000

Operating profit / (loss)	**(23,993)**
Other income 1 - Central Government and other grants	24,000
Net pre taxation profit / (loss)	**7**

19.5 Financial Implications - Funding

19.5.1 Table 29, above, shows a loss to the FM of just under £24m before any other income / public sector grants.

19.5.2 This reflects a high likelihood that the FM will require some form of ongoing subsidy to support their operations. Modelled on a profiled basis (peaking during the stable lending phase), this subsidy requirement of £24m is assumed on the minimum necessary basis, to either enable a FM to meet costs whilst operating on a not for profit social enterprise basis (as per the model employed by Lendology), or to generate a small profit margin based on identifying commercial efficiencies of scale against the estimated operating cost base. Alternative FM cost base scenarios are modelled as part of the sensitivity analysis section of this financial case.

19.6 Loan Fund

19.6.1 The following key assumptions have been made in respect of the ATP Fund within the financial model. Except where specifically mentioned, these assumptions have been based on research and consultations carried out by Amberside, other than the assumptions relating to volume and mix of lending, as highlighted below.

19.6.2 **Volume and Mix of Lending:** The illustrative packages of measures applied for financial modelling purposes are the same as those applied in the economic case, as detailed in Table 16 - Measure package description. Whilst a borrower is not restricted to those specific 'packages', the illustrative packages offer a consistent baseline for business case purposes. It also enables a typical cost to be applied to each package of measures, as per Table 30, based on the regional property insights (as summarised in the Strategic Case and relevant Annex), and the indicative mix of borrowing to be proportionally aligned to the regional scale of opportunity for each package of measures.

Table 30 - Cost of Measure Packages

Measure Package (S)	Typical Cost £ To Borrower	% Of Applications
Package of measures #1	6,430	14%
Package of measures #2	17,024	72%
Package of measures #3	33,118	6%
Package of measures #4	24,170	2%
Package of measures #5	26,732	6%

19.6.3 Where applicable, the typical cost of a loan to the borrower is net of an assumed £7,500 grant for a heat pump. Note, the calculated typical cost to a borrower is subject to cumulative inflation at an average of 4.5% pa. Whilst alternative inflation profiles can be

readily applied, the financial model assumes that a broadly higher inflation profile persists, midway between the rate at the time of financial modelling in Autumn 2023 (6.7%) and the BoE target rate.

19.6.4 The forecast of volume of applications into the ATP Fund over time is summarised in Table 31Table 31 - Loan Book Volume by year below.

Table 31 - Loan Book Volume by year

Year	No. of Applications
Year 1	250
Year 2	750
Year 3	1,500
Year 4	1,500
Year 5	1,500
Year 6	1,500
Year 7	1,575
Year 8	1,625
Year 9	1,700
Year 10	1,700

19.6.5 **Lending Assumptions**: It is assumed that the lending period is 10 years – as per the table Table 31 above – and that all loans are repayable over a 10 year period. Other key assumptions associated with the ATP Fund's lending profile are set out in detail in the tables below. It is further assumed that this pilot Fund will only offer Tranche A type loans to borrowers (which have relatively low due diligence requirements). The Financial Model's functionality has been developed to accommodate Tranche B type loans of borrowers (which have higher due diligence requirements, and therefore a higher cost due to the higher credit risk associated with this type of borrower).

Table 32 Application Success Rate by Creditworthiness

CREDITWORTHINESS TRANCHE	% APPLICATIONS
Tranche A - lower due diligence	70%
Tranche B - higher due diligence	50%

Table 33 - Loan Default Rates by Creditworthiness

CREDITWORTHINESS TRANCHE	% DEFAULT PA
Tranche A - lower due diligence	1.15%
Tranche B - higher due diligence	4.52%

Table 34 - Early Repayment Rates by Creditworthiness

Creditworthiness Tranche	% Loans Repaid Early	# Years Into Loan
Tranche A - lower due diligence	5%	5
Tranche B - higher due diligence	5%	5

Table 35 - Interest Rate Pricing by Creditworthiness

Creditworthiness Tranche	Interest Rate (%)
Tranche A - lower due diligence	6.10%
Tranche B - higher due diligence	9.15%

19.6.6 Each of the above credit-related parameters were developed during the Amberside research, utilising a range of market sources for similar private sector products (including green mortgages) or market data for loan default rates.

19.6.7 **Funding Assumptions:** As noted in the economic case, the preferred option is a blended public private loan fund, and a total value for the Pilot Loan Fund of £100m. Amberside research into the funding mix indicates that some existing blended funds have achieved a public/private funding source ratio of 1:4. However, in this case due to the relative novelty and essential retail loan fund nature of the proposed ATP Fund, a lower ratio is considered more realistic. A public/private funding mix of £40m/£60m has been applied to the Financial Model.

19.6.8 Amberside's research indicates a wide range of expectations in respect of private capital return across private equity and infrastructure funds. The ATP Fund could reasonably expect to sit at the lower end of these expectations, due to the anticipated low return nature of this retail loan fund. An assumed 8% target IRR on private capital has been included in the Financial Model.

19.6.9 Other key assumptions in relation to funding are:

- The 8% target return on private capital is a blended rate of return that covers a range of private funding sources, and by extension, different rates of return expectations;
- Available funds are drawn down when required (to meet lending commitments and costs) and returns to the ATP Fund (i.e. loan repayments) are recycled rather than returned to investors during the active lending period;
- Repayments are made to investors in line with their % investment in or funding of the ATP Fund, as and when funds are available;
- Public funding is invested first and repaid last – which serves to increase the IRR% to sources of private capital. An alternative model on a Pari Passu basis is set out as part of the financial case sensitivity analysis.

19.6.10 The consulted private sector investors tend to view the 8% of Equity IRR on the £60m capital investment on the lower end of the expected returns, ranging between a mortgage (7%) and leasing arrangements (15%). Given that the base case is an unleveraged IRR and leverage can be included to bolster the return, Amberside advises that the unleveraged IRR remains at 8% as the base case: further scenarios including debt financing can be analysed at a later stage to adjust the base case IRR. This is because the proposed large scale residential retrofit fund is not commonly known to investors, and there is no example to benchmark its fund performance. Given the proposed structure where credit enhancement is put in place, such as the "first-in-last-out" type of public funding and the additional injection of subsidy to support the FM operations, the generally low-risk profile of the fund should be recognised. Amberside could assess that the consulted investors are interested in this asset class, and the potential for scalability it represents.

19.6.11 In order to achieve the proposed £60mn capital raise, it will be necessary for investors to fully understand the risk and return profile of this product, once this business case has been agreed in principle by public sector stakeholders. In particular, this will involve interrogating a confirmed Fund proposition in terms of legal and compliance structure, in addition to indicative scale and sources of cornerstone public sector funding. Investors may also expect to see an opportunity for debt financing to be introduced into the Fund, in order to increase the equity returns beyond the unleveraged 8% rate analysed for business case purposes.

19.6.12 **Financial Implications - Profit and Loss Forecasts**: The resultant ATP Fund profit and loss forecast over a 20-year lifetime is summarised in Table 36, below. Detailed, year by year forecasts over that 20-year period, are presented in Table F2 in the specific 'Report Tables' worksheet within the financial model.

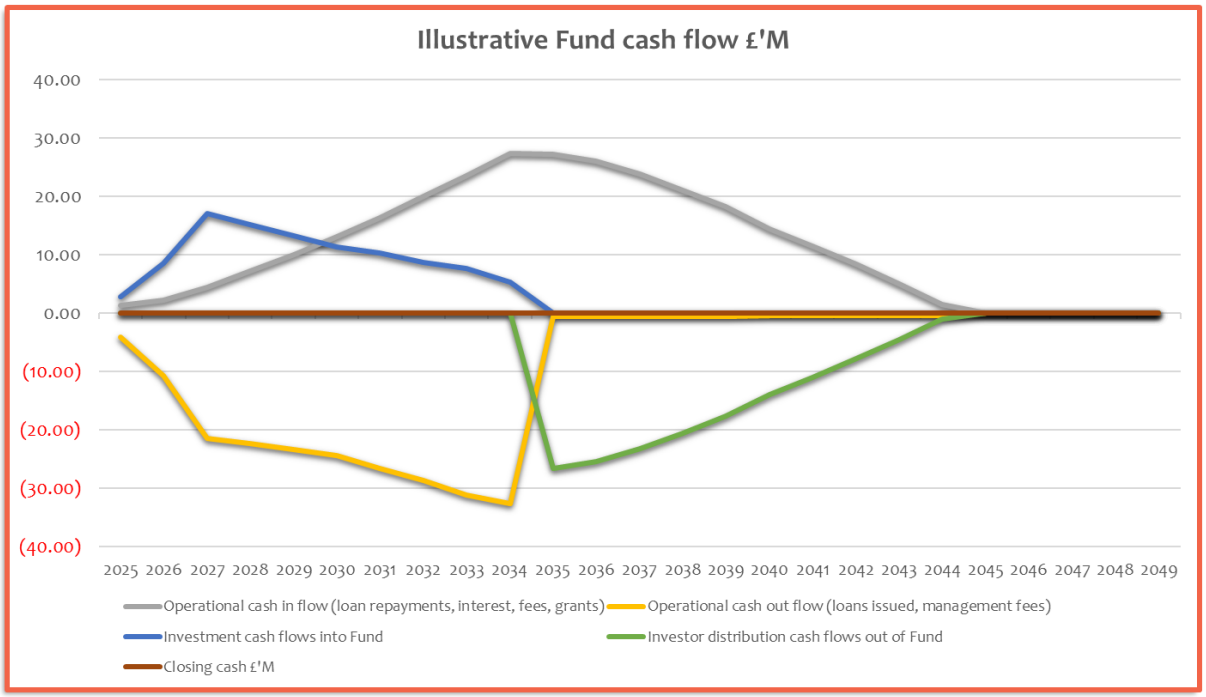
Table 36 - Illustrative Fund Profit and Loss Forecast

Income	**£'000**
Interest received on loans - tranche A	68,795
Loan early redemption fees - tranche A	308
Loan set up fees (successful & unsuccessful) - tranche A	1,763
Grants and other funding	10,000
Total income	**80,866**
Expenditure	**£'000**
Loan specific fees - set up	1,763
Loan specific fees - early repayments	308
Other Management Fees	15,000
Sub-total - fees accruing to fund manager	17,071
Provisions / write offs - tranche A	11,890
Total expenditure	**28,961**
Net pre taxation profit / (loss) before returns to investors	**51,905**

19.6.13 **Financial Implications – cash flow forecasts**: Figure 13Figure 13 - Illustrative Fund Cash Flow below presents a visualisation of the illustrative ATP Fund cash flow. This diagram shows the following:

- a 10-year period of loans being actively issued (yellow line)
- investment cash flows (blue line) to fund the loans
- loan and interest payments over time, utilising the revolving fund principles (grey line)
- investor returns are distributed (green line).

Figure 13 - Illustrative Fund Cash Flow



19.6.14 Table 37 - Illustrative Fund Cash Flow - Pre-Investment finance flows below, summarises the total cash in flows and out flows (excluding investment), resulting in a forecast £52m lifetime profit before tax of the ATP Fund.

Table 37 - Illustrative Fund Cash Flow - Pre-Investment finance flows

Pre Investment Finance Flow Items	£'000
Cash in flow	
Scheme fund - loan repayments (tranche A)	195,553
Client interest - loan interest income (tranche A)	68,795
Loan early repayments (tranche A)	6,146
Loan specific fees (tranche A)	2,071
Grants and other funding	10,000
Total inflow	**282,564**
Cash out flow	
Loan specific fees (tranche A)	2,071

Other management / loan admin fees	15,000
Loans issued to clients (tranche A)	213,589
Total outflow	**230,659**
Opening balance - pre investment	**0**
Net flow - excluding investment	51,905
Closing balance - pre investment	**51,905**

19.6.15 Table 38 – Illustrative Fund Investor Cash Flows, below summarises the associated investment cash flows as Figure 13, with £100m of investment into the ATP Fund across public and private sources, and £152m of distributions, which includes £52m profit. The detailed cash flow tables are presented as Table F3 in the specific 'Report Tables' worksheet within the financial model.

Table 38 – Illustrative Fund Investor Cash Flows

Investor Cash Flow Items	£'000
Investment account – receipts (public capital sources)	(40,000)
Investment account – receipts (private capital sources)	(59,871)
Investment account – distributions (public capital sources)	60,710
Investment account – distributions (private capital sources)	91,065
Sub total – net investment cash flows	**51,905**
Net cash flow (public capital sources)	20,710
Net cash flow (private capital sources)	31,195

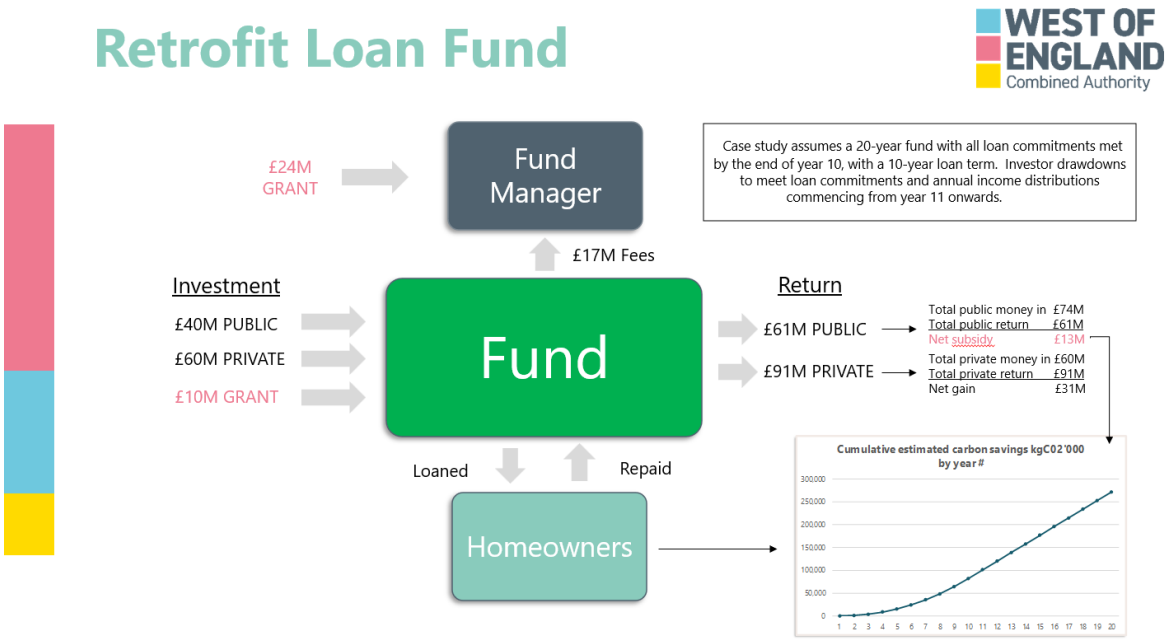
19.6.16 **Financial Implications – Funding:** The financial model produces a pre-tax profit of just under £52m, inclusive of an assumed £10m income from public sector grants, as per the Profit and Loss forecast in Table 36, above. This reflects an assumed level of subsidy to meet (but not exceed) the estimated private sector target return on capital (IRR%) of 8%. On this basis, the forecast returns on investment in the ATP Fund are as follows:

- Private capital - £60m funding investment, £31.2m net return, 7.9% IRR
- Public capital - £40m funding investment, £20.7m net return, 3.2% IRR

19.6.17 Initial stakeholder engagement with private finance representatives was undertaken to validate some of the assumptions made, in particular the IRR for private sector investors. As discussed in 19.6.10-11, the appetite to invest will depend on confirming the fund's legal and compliance structure, associated returns and public partnership in promotion of the fund, as already set out within the Commercial Case.

19.6.18 Public sector funding totals £74m, incorporating £40m public investment in the ATP Fund, plus an estimated £34m grant to support FM operations and underpin Fund profitability. Using the total forecast returns for the public investment of c £61m, then the value for the public sector subsidy reduces to c £13m. Figure 14, below summarises the key investment and return cash flows by source, in current day (rather than discounted) terms.

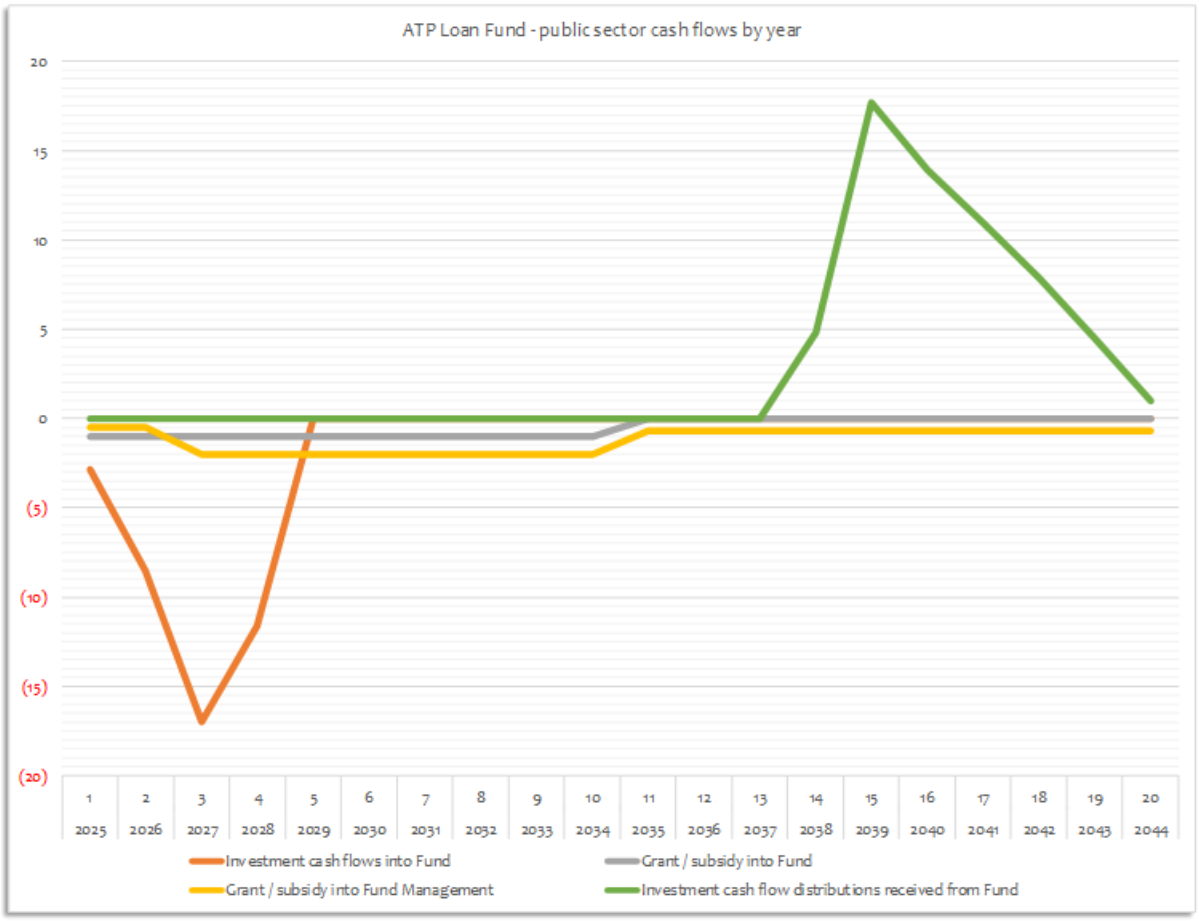
Figure 14 – Summary of investment and return funding flows



19.6.19 The powerful rationale for making this investment is that the value of fuel cost, carbon cost and air quality cost savings significantly outweigh the net subsidy of c. £13m. The social costs and benefits are articulated in detail in social NPV terms within the Economic Case. That public sector investment would be required over a number of years – as set out in Figure 15 below – rather than all up front.

19.6.20 The development of this business case has deliberately been carried out on a highly consultative basis with those key public sector stakeholders who would be in a position to commit or secure finance for the ATP Fund at the scale required, including DESNZ, GFI, the Combined Authority and UKIB. Clearly there is – as detailed in the Strategic Case – a strong correlation between the priorities of the ATP Fund and those organisations.

Figure 15 – Estimated public sector cash flows over time



20 AFFORDABILITY

20.1 Central Financial Case Affordability

20.1.1 The core financial conclusion is that, under the central modelled financial case, the ATP Fund is financially viable, i.e. it can operate and generate returns to private capital at a level sufficient to generate funding interest, subject to an element of subsidy being available from the public sector.

20.1.2 Totalling an estimated £34M, this subsidy is partly (£10M) to underpin the required level of return on private capital invested in the ATP Fund and partly (£24M) to support FM operations). Note that the £34M subsidy is separate from the assumed £40M public sector investment in the ATP Fund, on which a £20.7M net return is forecast. Viewed collectively the project requires a £74M gross public sector commitment, against which £60.7M of returns are forecast, meaning that there will be a requirement for a net public sector commitment of £13M across the lifetime of the scheme.

20.2 Sensitivity Analysis – Modelled Financial Case Sensitivities

20.2.1 Sensitivity analysis is carried out within the financial model in order to test the core financial conclusions, examining the financial viability of the ATP Fund under different financial assumptions.

20.2.2 The core assumptions that have been subject to sensitivity analysis within the financial model are:

- Variable blended target % IRR on private capital – looking at +/-1% and +/- 2% around the central case assumption of 8%;
- Interest charged to homeowners - looking at +/-1% and +/- 2% around the central case assumption of 6.1%, plus a zero-rate example;
- Default rates - looking at +/-0.25% and +/- 0.5% around the central case assumption of 1.15%pa default;
- Fund manager costs - looking at +/-1% around the central case assumption of 2.5% pa of Gross Fund size (during stable lending phase);
- Investment funding flow – looking at a Pari Passu approach rather than the central modelled financial case of public funding being invested first and repaid last;

20.2.3 Table 39 below summarises the key variable outputs (column headers) under each of the above sensitivity scenarios.

Table 39 - Financial Model Key Variable Outputs

Scenario	Fund Lifetime Pre Tax Profit £M	Public Sector Subsidy £M	Net Public Sector Commitment £M
Central modelled financial case	52	34	13
Private capital IRR requirement 6%	42	24	7
Private capital IRR requirement 7%	48	30	11
Private capital IRR requirement 9%	55	37	16
Private capital IRR requirement 10%	58	40	19
Interest charge to homeowners 0%	25	74	69
Interest charge to homeowners 4.1%	42	48	33
Interest charge to homeowners 5.1%	48	42	23
Interest charge to homeowners 7.1%	57	26	4
Interest charge to homeowners 8.1%	67	24	-2
Default rate 0.65% pa	56	32	10
Default rate 0.90% pa	53	33	11
Default rate 1.40% pa	50	35	16
Default rate 1.65% pa	49	37	18
Stable lending phase FM costs 1.5% Gross Fund size	52	18	-3
Stable lending phase FM costs 3.5% Gross Fund size	52	50	29
Pari Passu investment	74	56	26

20.3 Financial risk and mitigation

20.3.1 In considering the sensitivity results and identifying key financial risks it is important to distinguish variability of financial outcomes from financial risk.

20.3.2 In particular, the most significant variability in financial outcomes to the Fund – and to public sector stakeholders – relates to the interest rate charged to homeowners. Under the modelled interest rate scenarios, public sector subsidy could range from £24M to £74M (and net public sector commitment after forecast returns could range from -£2M (8.1% interest) to £69M (0% interest), compared to £13M under the central modelled financial case).

20.3.3 As a risk, however, interest rate variability is mitigated by the ability of the ATP Fund to set the interest rate at which it lends. (To note: important related policy and market considerations about how affordable stakeholders wish to make loan products for homeowners, and what the impact may be to demand should long term borrowing costs track significantly below the 6.1% central modelled scenario).

20.3.4 Pari Passu investment reflects a potential scenario where all investors are afforded equal status, as opposed to the modelled assumption that private sector investment goes in last and is repaid first. This scenario has a material financial impact (albeit significantly less than certain interest rate scenarios), potentially increasing the net public sector commitment from £13M to £26M. This is because additional subsidy would be required to meet private sector target returns on capital, measured on an IRR basis. If private investment goes in earlier and returns on that investment are received later than under the base case modelled scenario, that will reduce the IRR%.

20.3.5 The hierarchy and individual status of the investments and their associated returns to investment is considered in the Commercial Case and should be determined before any investments are made into the Fund.

20.3.6 The same applies to Fund management costs, which may vary from the financial model assumptions following a procurement of the Fund Manager.

20.3.7 Loan repayment defaults will represent a financial risk throughout the entirety of the ATP Fund operational phase. A competent Fund Manager with robust vetting and credit checking, coupled with agreed minimum financial standards expected for borrowers will mitigate against this risk.. As previously stated the regional operator, Lendology, operating in a similar market and location, is understood to have a default rate of 0.3%, i.e. well below the financial model's assumption.

20.3.8 In conclusion, whilst there remains a risk of variance against the financial outcomes set out in this Financial Case, the key drivers of those financial risks – pricing and terms of investment and contracting with a Fund Manager – will be subject to negotiation and contracted (i.e. the risk of variance removed or substantially reduced) before the point at which public sector investment (and subsidy) is formally committed.

MANAGEMENT CASE

21 OVERVIEW OF MANAGEMENT ARRANGEMENTS

21.1 Introduction

21.1.1 The Management Case assesses whether a proposal can be successfully delivered by the organisation and its partners. It sets-out the arrangements for delivery, monitoring and evaluation of the scheme, specifically elements such as: project planning, governance structure, risk management, communications and stakeholder management, benefits realisation and assurance (e.g. a Gateway Review).

21.1.2 There is still uncertainty regarding some fundamental elements of the proposal, specifically where the public capital (comprising loan fund investment and subsidy for Fund Manager fees) will be derived from, how it will be invested in the fund and the specifics of the fund structure. The uncertainty on the source of funding means that it is not possible to fully detail the required management arrangements in as much detail as would be normally provided. However, we will set-out the expected management arrangements required to be put in place for the delivery of the £100m fund and the working assumption that £40m of funding investment is provided by DESNZ. It is acknowledged that the public sector portion of the Fund could be provided directly by the Combined Authority or potentially the UKIB. The origin of the finance will have fundamental consequences for the management and governance arrangements.

21.2 How the Project will be Managed

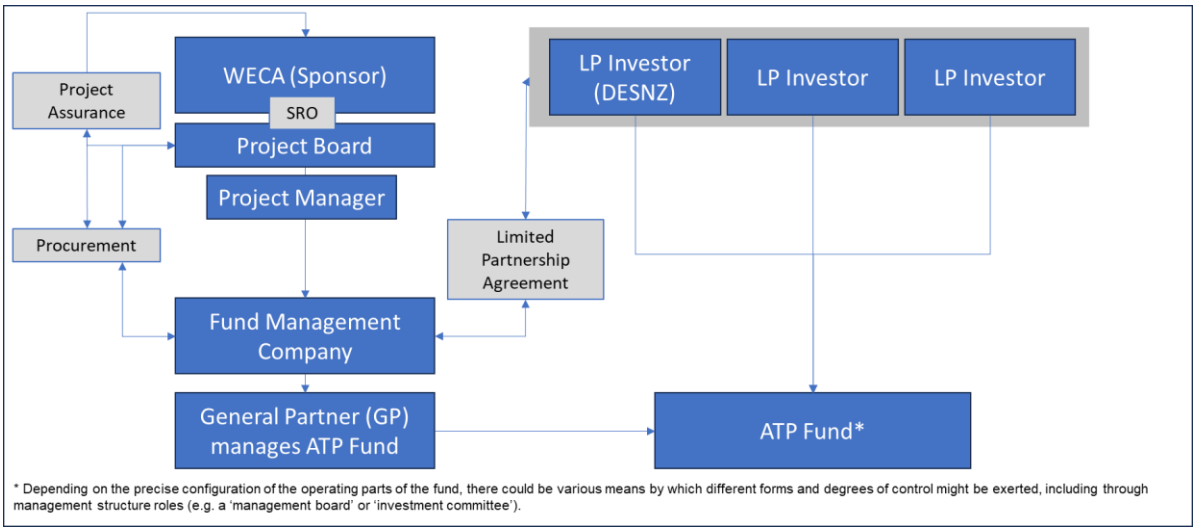
21.2.1 To align with best practice there needs to be clear identification of a sponsor, it has been indicated that this is likely to be the Combined Authority. The Combined Authority will be responsible for the success of the project and will provide the necessary guidance and resources to the Project Board and Project Manager. The Project Board will need to agree clear Terms of Reference, which will include membership, voting rights and include likely activities (e.g. decisions to be made) and any reserved matters.

21.2.2 The Project Board will need supplementing with additional expertise from SWNZH and DESNZ. The sponsor would need to appoint a suitably qualified Project Manager (likely to be a Prince 2 qualified manager or equivalent) with a clear Project Brief. The Project Brief is an initial view of what the project is to achieve and will identify key elements of the project and steps that will be followed to reach the strategic objectives. It will form the basis of agreement between the SRO and the Project Manager and Project Board.

21.2.3 In terms of governance of the project there is an expectation that there is clear identification of a sponsor, Senior Responsible Officer (SRO) and that the membership of a Project Board can be identified. For this proposal whilst these are not certain at this point, there have been indications from the Combined Authority and SWNZH as to roles that would be members of the Project Board.

21.2.4 An additional area for consideration relates to the governance of the organisation responsible for lending. As per the Legal Report it is likely that the Fund Manager and Lender are likely to be separate organisation, and this may have implications for the required governance and management. Currently we are not far enough advanced to understand this in any detail, as once again it depends on how the Fund is set-up, where the capital is coming from, and the appropriate level of permissions required for each regulated element of the Scheme.

Figure 16 – Illustrative Fund diagram



21.2.5 The Project Board will be composed of, but not limited to the following roles:

- Project Sponsor (Optional)
- SRO
- Project Manager
- Business Owners (Combined Authority / SWNZH)
- Fund Manager Representation
- Benefits Manager (Optional)

21.2.6 In addition, there may also be a requirement for representation on the Project Board by DESNZ and/or UKIB depending on the funding source.

21.3 Specialist Advisors

21.3.1 The Project Board, if as broadly above, will need to be supported by specialist advisors, for example Commercial, Legal and Procurement expertise. The use of specialist advisers is strongly encouraged where the necessary capabilities and competencies are not available or limited, as may be the case for each of the organisations implementing this scheme.

21.3.2 The specific legal expertise (especially in relation to FCA permissions) will be critical to support the development of the key requirements and the associated contracts for the procured services, and which will form part of any Invitation To Tender (ITT). It is important

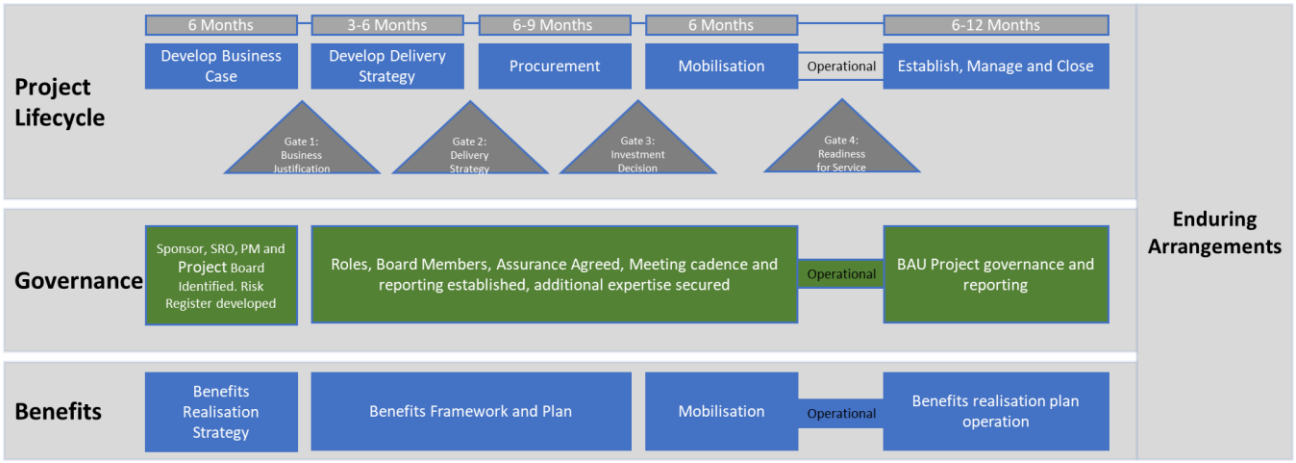
that a suitably experienced and FCA authorised Fund Manager, and any separate lending organisation, have the necessary FCA permissions to carry out the regulated activities in respect of this scheme.

21.4 Project Plan

21.4.1 The project will follow a gateway process as described below, or one similar as already approved and used within the Combined Authority. A fully resourced Project Plan and a formal risk register with key authorization steps has been proposed by the Combined Authority and will be enacted following the conclusion of this Business Case.

21.4.2 It is critical that there is a clear understanding of the required governance at each gate, however this understanding is currently restricted because of the lack of certainty as to the funding source.

Figure 17 -Illustrative Project Life Cycle



21.5 Change Management

21.5.1 Projects are about delivering change, as such this change needs to be managed and supported by individuals within the organisation. There is a need for a Change Management Strategy (linked to benefits realisation); a change management framework (to manage anticipated and unexpected change) and a plan (to explain what will be delivered, by whom and when in terms of underlying activities).

21.5.2 The Change Management Strategy should consider the potential impact of the proposed change on the organisation, its people, systems, and processes. This strategy should also consider the wider impact across other Combined Authorities and Local Authorities, and potentially on a national level.

21.5.3 The specific Change Management Strategy to be adopted will depend upon the speed and scale of change and should also include provision for the communication and training required to adopt the strategy. The framework should detail the required governance and reporting arrangements, whilst the plan should set out the communication and deliverables

required for the mobilisation phase with timings and how personnel with the organisation have contributed to the plans and been involved to date.

21.6 Assurance

21.6.1 For a project of this size and nature it would be best practice to appoint a suitability qualified organisation to undertake independent assurance, typically they are involved in the gateway process at the decision gates to provide information to the decision-making body.

21.6.2 We would expect that there is specific FCA Regulation Assurance activity that forms part of the procurement and contracting activities to ensure that the Delivery Partner(s) selected hold the necessary permissions to deliver the services that they are being contracted for.

21.6.3 The Combined Authority has it within the scope of its authority to appoint independent assurance if the project approach aligns with the gateway approval process. Depending on the source of the finance this may have implications for whether independent assurance is required throughout the gateway process, i.e., UKIB or DESNZ may stipulate independent assurance for example.

21.7 Risk Management

21.7.1 The Combined Authority needs to develop a Risk Management Strategy, Framework and Plan. The strategy should cover the management of risks during the key phases of the project, it should be proactive and include how they will manage risk effectively. The Risk Management Strategy should include identifying possible risks in advance and putting mitigations in place to minimise the likelihood of them materialising. The strategy should also ensure that there are processes in place to monitor risks, and that there is updated and reliable access to risk information. There should be clear decision-making processes supported by a framework for analysing risk and evaluating the potential to realise the identified risks. The framework should also detail what senior management support is required, the ownership of risk within the organisation, how the leadership engages with and reviews risk management policies and how risk management policies will be communicated to all stakeholders.

21.7.2 Together the strategy and framework should help establish a culture within the organisation that supports a considered approach to taking and managing risk. The management of risk, together with the organisational roles and responsibilities and reporting lines should be clearly evidence in the overall project management arrangements.

21.7.3 A summary of risks is provided below. These do not represent every risk discussed throughout the business case, as risk analysis for the economic assessment also covers risks that fall out of our main recommendations.

Table 40 - Summary of risks to the scheme

RISK TO THE PILOT SCHEME	BUSINESS CASE REFERENCE
Delivery: Fund administration	3.5.14

Delivery: Reputation of loans and partners	3.5.15
Delivery: quality of measures and installation	3.5.16
Consumer appetite for, and uptake of, loan fund	3.6.1
Investor attitude and demand	3.6.4
National policy	3.6.12
Supply Chain capacity	3.6.15
Need to appoint suitable fund manager	13.1
(Potential) Insufficient interest from fund management	16.3.2
(Potential) Lack of credible Fund Managers to manage the Fund and/or a lack of credible Consumer Credit Lenders to deliver Consumer Credit Lending	16.3.2
(Potential) Lack of private-sector funding and/or a lack of commercially attractive investments to make the scheme viabl3	16.3.3
(Potential) Higher than anticipated Homeowner loan repayment defaults, leading to lower returns to the investors	16.3.4
(Potential) Insufficient numbers of suitably qualified retrofit installers to meet the demand of the scheme	16.3.5

21.8 Benefits Realisation

21.8.1 The Combined Authority will need to develop a Benefits Realisation Strategy which should detail how benefits will be identified, planned for, and tracked as part of the benefits register. The strategy should also include a Benefits Realisation Framework which will serve as a management tool to monitor, track, and manage the benefits associated with the project, including identifying the Responsible Officer for each. Projects must detail benefits within a Benefits Register that will indicate how they will be realised. The Benefits Register is a live document and should be reviewed regularly, updated, and should capture key information concerning each benefit, as set out in Table 41:

Table 41 – Benefits Register Components

BENEFITS REGISTER	
Number	(Unique identifier)
Benefits category	(Financial. Non-financial, tangible, non-tangible)
Description	(Including any enabling projects or activities)
Service feature	(What area if the project will give rise to the benefit)

Potential costs	(Likely to be incurred during delivery)
Required activities	(Undertaken to secure benefits)
Responsible Officer	
Performance measure	(KPI)
Target improvement	(Expected level of change)
Full year value	
Timescales	

21.8.2 The project SRO is ultimately accountable for the overall realisation of project benefits, even where benefits may take years to be fully realised. As such, they are responsible for ensuring that an effective benefits realisation plan is developed, maintained, and implementation. The SRO and project manager may identify a need for a dedicated project benefits manager, or as a minimum, a resource who owns this activity as part of their delivery role. They would be responsible for co-ordinating and developing benefits management activities and/or establishing a benefits management working group. Where appropriate, this role could also be combined with that of the project manager.

21.8.3 Table 42 below, has identified the key benefits which can be quantified for which a realisation plan will need to be further developed. There are also non-monetised benefits within the economic case including health and energy security benefits.

21.8.4 Further detail on the benefits can be found within the Strategic Case and the Economic Case.

Table 42 – Benefits Identified

Benefit Identification	Benefit Quantification	Indicative Timings
Carbon Savings or Cumulative GHG Emission Savings	HM Treasury's £/tonne of carbon saved metrics	Annually
Direct energy cost savings to households	Estimation methodology to be developed	Annually
The GVA of estimated employment impacts	Applying an estimated £109k construction spend / Full Time Employee ('FTE') based on ONS construction industry statistics (2020) and an estimated £45k GVA per construction employee	Quarterly
Regional Deployment	Fund percentage distribution per region	Annually
EPC Improvements?	Estimation methodology to be developed	Annually
Employment	FTE jobs created	Quarterly
Return to Investors	Return on Investment	tbc

Validation of the Fund Model	tbc	tbc

21.8.5 From the information we have received and in discussions to date it is clear that the organisations are not yet ready to formally launch a project to procure a Fund Manager and the associated services, but want to progress with identifying the source of capital and to ensure that the governance arrangements are aligned to any funders requirements. As a result, before significant developments can be made on the specifics of the fund management, there are additional decisions to be made and work to be completed.

21.9 Further Work to Develop the Management Arrangements

21.9.1 There is further detailed work to be undertaken to develop the management arrangements for the current proposal, particularly in the following areas:

21.9.2 Governance and Personnel

- Finalise the sponsor position for the project;
- Finalise the SRO position and the membership of the Project Board;
- Finalise the work package for the Project Management;
- Agree upon whether a benefits manager / benefits working group is required;
- Agree upon the assurance framework for the project (Independent / In-House);
- Agree upon where the funding is being derived from and ensure that any funders' requirements are built into the governance structure and built into the contractual arrangements of the Fund and its partners;
- Develop Contingency Arrangements and Plan is the preferred proposal is not taken forward;
- The above should be presented within a governance framework (project structure, reporting lines, roles and responsibilities), together with named individuals, any vacancies and plans for any future changes;
- Specialist advisors: define specific work packages and expected deliverables, for example Procurement, Legal and specialist support in respect of FCA requirements and permissions;
- Governance arrangements: Relationship between the Fund Manager and Lender, etc.

21.9.3 Documentation

- The Project Brief is an initial view of what the project is to achieve and will identify key elements of the project and steps that will be followed to reach the objectives. It forms the basis of agreement between the Senior Responsible Owner (SRO) and the project manager and team and sanctions moving the project forward so more detailed planning can be undertaken;
- Project Board ToR; including membership and voting rights and mechanisms;

- Project Plan;
- Stakeholder Map;
- Development of a Risk Management Strategy, Framework and Risk Register, with full ownership and mitigations;
- Change Management Strategy, Framework and Plan;
- Benefits Realisation Strategy, Framework, Plan and Benefits Register; this should include further analysis of the identified benefits and definition in terms of how and when (associated with specific milestones) they will be achieved, the main beneficiaries, the measurement metrics, data requirements and frequency of assessment, the baseline to be utilised, anticipated performance (targets) and the main risks associated with achieving the specific benefit.
- At this stage of the scheme, the management case needs to be flexible to address either a larger scale national fund or a scaled back local type of fund. We will provide a high-level analysis on a national vs a combined authority vs local approach in terms of a SWOT analysis.

APPENDICES

22 APPENDIX 1: EXISTING RETROFIT SCHEME EXAMPLES

22.1.1 UK domestic retrofit scheme examples can be seen in Table 43Table 43, below.

Table 43 - UK Domestic Retrofit schemes

	Home Energy Scotland Grant and Loan	Basingstoke & Deane EE Loans and Grants	Barclays Green Home Mortgages
Summary	Domestic retrofit loans and grants provided by the Scottish government. Supporting homeowners with energy efficiency and renewable energy technologies	Council-level scheme offering grants and loans Wider coverage including homeowners, landlords, community groups within the region	A private sector example of retrofit finance. Large capital support deployed for energy efficient new home buy, subject to variable interest rates
Fund Structure	**Public Sector** 100% funded from a c.£350m government programme, "Heat in Buildings Grants and Loans", which is shared between 5 schemes **Fund Manager** The fund managed by Energy Saving Trust, an independent energy efficiency focused organisation **Special Advisor** Heat and Energy Efficiency Scotland	**Public Sector** 100% UK government grant, "Home Upgrade Grant" £41.4m awarded to Warmer Homes Consortium where B&D Council is a partner (total 12 councils) **Fund Manager** Independently managed by Parity Trust	**Private Sector** 100% private sector-funded
Advantage	**Low Interest Rate** Interest free	**Flexible Repayment** Currently Interest rate at 4.49%, but offering flexible repayment options – capital repayment / interest-only (bullet) / interest roll-up with varying tenors	**Large Scale** Ability to source large capital, enabling the size of loans to scale up way above public-funded schemes **Attractive to ATP Sector** Available for buy-to-let properties as well
Disadvantage	**Limited Scale** No private sector participation, resulting in a small scale fund with no leverage	**Limited Scale** No private sector participation, resulting in a small scale fund with no leverage	**High Interest Rate** - Fixed (c5.6–6.6%) - Afterward (c.7.6–8.6%) **Tougher restrictions** Potentially limiting consumer demand

	Home Energy Scotland Grant and Loan	Basingstoke & Deane EE Loans and Grants	Barclays Green Home Mortgages
Comments	100% public-funded scheme, allowing low/free interest rate A simple legal structure with an independent fund manager However, no private fund blended, resulting in a limited scale of delivery	Similar to Home Energy Scotland – 100% public-funded, simple legal structure, no private fund blended. Different – interest charged at 4.49%, and still a good demand from consumers. Flexible repayment terms as a success factor.	A good example demonstrating the effect of private sector participation. Ability to significantly scale up the size of loan / fund However, inability to offer an "affordable" interest rate due to the bank assuming credit risk

22.1.2 International examples of retrofit loans are provided in Table 44 - Analysis of Non-UK Retrofit Loan offeringsTable 44, below.

Table 44 - Analysis of Non-UK Retrofit Loan offerings

	ANZ Good Energy Home Loan (New-Zealand) CommBank Green Loan (Australia)	Canada Greener Homes Loan (Canada)	Residential Property Assessed Clean Energy (R–PACE) (US)	KfW Energy Efficient Construction and Refurbishment Programme (Germany)
Summary	Both schemes are an example of private sector retrofit finance	Central government loan scheme, offered as part of Canada Greener Homes Initiative (GHI)	Local government scheme that enables a long-term repayment through municipal bond issuance and collecting repayment through tax bills Currently available in: California / Florida / Missouri	A state bank loan, sourced with low cost, lent out to commercial banks, and finally offered to homeowners for retrofit projects In essence, a private sector scheme enshrined in municipal credit
Fund Structure	**Private Sector** 100% private sector-funded	**Public Sector** 100% Canadian government-funded **Fund Manager** Not known, assumed to be internally managed **Special Advisors** Special advisors allocated to Each scheme of GHI for effective application /	**Public Sector** Issuance of municipal bonds at the local government level **Private Sector** Purchase of the municipal bonds, or purchase of a tax lien from taxing authority	**Private Sector** 100% private sector-funded (however, a state bank) **KfW** Sourcing fund from the capital market **Commercial banks** Borrowing from KfW and lending to homeowners

	ANZ Good Energy Home Loan (New-Zealand) CommBank Green Loan (Australia)	Canada Greener Homes Loan (Canada)	Residential Property Assessed Clean Energy (R–PACE) (US)	KfW Energy Efficient Construction and Refurbishment Programme (Germany)
		inspection / operation processes		
Advantage	**Low Interest Rate** ANZ: 1% fixed (3yrs) + c.5-7% fixed / floating (total 30yrs) CommBank: 2.99% (10yrs) + floating (total unknown)	**Low Interest Rate** Interest free	**Private/Public Blended Fund** Municipal bond encouraging private sector to participate in the scheme, thereby achieving a large-scale fund with leverage **Long-Term Tenure** Up to 25–30 years of long tenure enabling lower repayment spread across the tenure **Easy Access** No strict eligibility therefore attracting wider consumer demand **Repayment – Tax Bills** Repayment of PACE loans made through tax bills thereby delaying loan repayment and helping the homeowner maintain a positive cashflow	**Large Scale** As privately sourced, the fund size not limited like public-funded schemes In addition, the individual loan size up to €120,000 plus “repayment bonus” up to €30,000 based on energy efficiency performance **Low Interest Rate** Offered at low rates as a result of low-cost funding from KfW (thanks to their AAA credit rating) **Cost Efficiency** Cheap loans deployed through individual commercial banks who have existing customer database **Creation of Jobs** Well acclaimed contribution to the German economy, contributing to nearly 50% of Germany’s climate protection goals for the housing sector
Disadvantage	**Conditional Offer** Only offered to their existing mortgage customers	**Limited Scale** Like the UK schemes, difficult to scale up the fund due to the absence of private fund	**No Assessment Control** Applicants make a voluntary assessment through a third party, and are not required to prove the need for retrofit. **Lack of Credit Check** Eligibility is based on the applicant’s mortgage payments regardless their ability to pay the loan. **Loan Tied to Property** The loan is tied to the property not the homeowner, meaning a potential risk of	**Second Seniority** The loan is secured through the title over the property, but second to the first mortgage holder

	ANZ Good Energy Home Loan (New-Zealand) CommBank Green Loan (Australia)	Canada Greener Homes Loan (Canada)	Residential Property Assessed Clean Energy (R–PACE) (US)	KfW Energy Efficient Construction and Refurbishment Programme (Germany)
			losing home if loans are not paid. Also, it can become difficult to sell home before repayment is paid off, as the buyer would not want to take the burden. **Second Seniority** PACE loan is subordinate to FHA-backed mortgage loans (Federal Housing Association)	
Comments	Affordable rate offered due to the loan size being small and the target audience being existing mortgages customers (likely reducing admin costs for credit checks, etc)	Similar to UK public-funded schemes – 100% public-funded, simple legal structure, no private fund blended	The scheme ultimately aims to attract private fund, and it is a blended fund insofar as it is a municipal bond with the government offering some degree of security to private funders. For consumers, it is an easy-to-access loan with repayment only through their tax bills, enabling them to keep a positive cashflow position.	KfW is both a state-owned entity with a high credit rating and a financial institution with knowledge and resources in the financial market. Their ability to source a cheap financing is ultimately the success factor. Coupled with it, the structure where loans are distributed to individual commercial banks and subsequently offered to customers creates an efficient ecosystem of retrofit financing allowing low cost of credit assessment and fund management.

22.1.3 Details of other funding schemes from the UK that are not specifically targeting domestic retrofit can be found in Table 45, below.

Table 45 - UK Non-Retrofit specific funds

	London Green Fund (LGF)	Mayor of London's Energy Efficiency Fund (MEEF)	GFI's Recommended Retrofit Fund Structure for GLA	GLA's Green Finance Fund (Outcome of GFI's Recommendation)
Summary	A fund of funds comprising 3 sub-funds covering 3 different sectors – retrofit, renewables and waste management – managed by the holding fund, LGF Successfully blending public and private fund, offered to developers and businesses	A standalone fund as a successor of LEEF. Solely focused on financing energy efficiency projects within Greater London, targeting commercial developers and businesses	As MEEF is ending in 2024, GLA needed to develop the successor scheme for commercial energy efficiency projects, and this is GFI's recommended fund structure	Following GFI's recommendation, GLA recently started Phase 1 of a new climate finance facility scheme (as the successor of MEEF). This phase is an in-house managed fund structure, but in view of transiting to an independent management in the later phase

	London Green Fund (LGF)	Mayor of London's Energy Efficiency Fund (MEEF)	GFI's Recommended Retrofit Fund Structure for GLA	GLA's Green Finance Fund (Outcome of GFI's Recommendation)
Fund Structure	**Public Sector (£110m)** £18m London Waste & Recycling Board £32m GLA £60m ERDF **Private Sector (£575m)** £10m Equity funder(s) £365m Banks & financial institutions (loan) £200m EIB loan **Holding Fund Structure** EIB manages LGF on behalf of GLA and LWaRB, and deploys funds to the 3 different urban development funds (UDFs) – i.e. sub-funds. **Holding Fund** LGF **Sub-Funds** 1.LEEF 2.Foresight Environmental Fund (FEF) 3.THFC Greener Social Housing Fund **Holding Fund Manager** EIB **Sub-Fund Managers** Amber Infrastructure Foresight THFC **Returns** Dividends, interests, principals, equity sale proceeds, return of equity	**Public Sector (£132m)** £51m ERDF £81m GLA **Private Sector (£470m)** £10m Equity investor(s) £100m EIB (senior debt) £260m Banks & financial institutions (loan) £100m Other private sector **English LP (PFLP)** The fund is structured as an English limited partnership, designating GLA as a limited partner, and Amber Infrastructure as the general partner **Fund Management** Amber Fund Management **Revolving Fund** Returns are made through dividends, loan interests and principals, potential equity sale proceeds or return of equity over the project life. And these are re-used in the fund for new projects. **Tiering** 1. Senior tranche (low-risk): private investors (e.g. commercial banks and fund managers), EIB (under MOU) 2. Junior tranche (high-risk): public funds (incl. ERDF), project developers, fund managers, private investors	**Broadly Similar Structure to MEEF** Although details are not stated, this is an establishment of a separate entity through which the fund is governed, with an appointed independent fund manager. Information is not given, but a structure involving an LP may be anticipated, like MEEF. But a key difference is that GFI recommends setting up the fund through multi-phases for the fund structure to fully develop. **Multi-Phases of Fund Development** The implementation of private sector as well as setting up the legal structure in its complete sense may take time. Hence, GFI suggests developing the fund in phases: setting up an internally managed fund with a cornerstone funding coming from GLA's balance sheet & public sources, followed by gradually onboarding private sector as the fund performance may build a short-term track-record.	**Public Sector** £90m GLA (cornerstone funding) **Public/Private Blend** £500m GLA (green bond) **In-House Management** The fund will initially be managed by GLA during this first phase. But this is to primarily mobilise private sector. The later phase will have a separate legal entity and manage the fund independently. **Cities Climate Investment Commission (3Ci)** The scheme aims to attract private sector by aggregating all the major cities, identifying 6 different asset classes relating to climate-related projects, and blending them to offer a range of portfolios with varying risk profiles.

	London Green Fund (LGF)	Mayor of London's Energy Efficiency Fund (MEEF)	GFI's Recommended Retrofit Fund Structure for GLA	GLA's Green Finance Fund (Outcome of GFI's Recommendation)
Advantage	**Private/Public Blended Fund** Enabled by the initial cornerstone funding from ERDF, the fund has successfully attracted private sector investors, achieving high leverage (c.9x). **Fund of Funds** The structure of a holding fund with 3 UDFs (energy efficiency, decentralised energy and waste management), each with a capable fund manager, enabled effective deployment of capital, efficient management of each sub-fund, and suitable incentivisation.	**Private/Public Blended Fund** Enabled by the initial cornerstone funding from ERDF, the fund has successfully attracted private sector investors, achieving high leverage (c.9–10x). **Tiering** Splitting the fund into 2 tranches attracts private sector participation, as public sector takes high-risk projects, and invites investors to lower-risk projects.	**Multi-Phases of Fund Development** With an arrangement of Phases 1–3, the scheme allows an efficient development of the fund. The first, in-house managing, phase allows a separate entity to develop. It also enables provision of financing to shovel-ready projects early on.	**Large Scale** The scheme effectively involves private sector through a municipal bond issuance and a blended structure of asset portfolio to meet the varying needs of investors. This allows the fund to be deployed at a significant scale.
Disadvantage	**Cost** The fund of funds structure requires increased admin and management costs. Additional layer of fees to be paid.			

	London Green Fund (LGF)	Mayor of London's Energy Efficiency Fund (MEEF)	GFI's Recommended Retrofit Fund Structure for GLA	GLA's Green Finance Fund (Outcome of GFI's Recommendation)
Comments	One of the first successful energy efficiency schemes that operated at a large scale. As evident, this large scale fund is achieved by attracting private sector, and appointing an independent fund manager with suitable expertise. The fund of funds structure may be justified, as the fund coverage encompasses a wide range of sectors. But it will have an increased burden of costs to run the fund.	The LP option helps distribution to limited partners be tax-efficient, and more specifically, the PFLP option reduces admin costs and eases reporting duties. As a successor of LEEF, MEEF efficiently focuses on energy efficiency projects through the fund manager with relevant expertise in the sector and fund structure. The tiering system invites private sector with varying degrees of risk appetite, but primarily ensuring them that public sector will take the high-risk portfolio of projects	Incorporating the advantages of the successful MEEF, GFI recommends a similar fund structure to continue to support GLA's objectives for Net Zero and fund energy efficiency projects. A key development in this recommendation is the idea of multi-phases. It resolves potential timing issues arising from setting up a separate legal entity for independent fund management, as well as allowing shovel-ready projects to kick-start without delay.	This scheme incorporates GFI's recommended fund structure (i.e. multi-phases fund development, and starting with in-house management. In particular, it starts with an issuance of a large green bond at £500m, as well as £90m from GLA's own balance sheet. The bond issuance is similar to PACE in the US, but different in that GLA contributes £90m from its own balance sheet which enhances mobilising private sector.

23 APPENDIX 2: METHODOLOGY FOR AFFORDABILITY ASSESSMENT, REGIONAL RESULTS

23.1.1 The affordability calculations are based on the following assumptions:

*After taking into account personal allowance and current income tax bands

** Mortgages costs are (on average) up to a third of monthly household income[68]

*** Expectations of current average energy bills, as listed by Uswitch[69]

**** Estimations of disposable income nationally[70]. Assumed tier-up from lower income households as single person households at ~£750 disposable or other monthly spend / person to £1,500 disposable spend / household at £50k onwards

23.1.2 Further research was then undertaken on the income deciles that reflected the level of affordability for the south west region. Using ONS Data on average household income for the period to 2021, the income deciles levels which reflect the affordability categories established in Step 2 are shown in the red box – the top 2 or 3 deciles in practice.

Mean equivalised household disposable income by decile for all individuals in the South West government region, 2018/19 to 2020/21

£ per year

	Decile groups of individuals ranked by equivalised household disposable income										
Year	Bottom	2nd	3rd	4th	5th	6th	7th	8th	9th	Top	All
2018/19	10,024	16,766	20,800	23,664	26,746	30,334	35,345	40,111	49,170	87,448	34,041
2019/20	10,688	17,784	21,435	25,500	28,921	32,609	36,130	42,329	49,587	74,389	33,937
2020/21	8,281	17,834	21,629	25,345	29,564	33,568	38,017	43,428	51,786	83,532	35,298

Source: Office for National Statistics

The whole market data created in Step 1 was then ranked by income decile according to the Index of Multiple Deprivation for England - Income Domain 2019 (found here) to establish which LSOAs would then fall into the upper three income deciles, with a southwest specific income decile then created to align to the ONS data. Thus the data has been filtered to include only those dwellings within the top 3 deciles of the ranked LSOA for the southwest and not England as a whole.

[68] https://moneyage.co.uk/average-mortgage-payment-now-a-third-of-monthly-income.php
[69] https://www.uswitch.com/gas-electricity/guides/average-gas-and-electricity-bills-in-the-uk/ [Oct 2023]
[70] https://www.finder.com/uk/disposable-income-around-the-uk

23.1.3 Please note this is a simple proxy for including only those households in the top 3 income deciles in the southwest (i.e. where disposable household income is above £43,428). The data, therefore, targets only those LSOAs where, predominantly, the households are in the top three income deciles in this region. This approach will enable us to understand the overall market for the pilot loan fund. In summary, it takes the total number of identified measures across the entire housing stock, and filters this so that the residual market predominantly applies to those households who are likely to be able to afford repayments based on specific loan values (typically £10,000 and above).

23.1.4 However, it does not enable us to undertake more detailed financial modelling for the loan fund itself, because it doesn't identify the combinations of measures which are likely to appear in individual households, and therefore the cost per dwelling, profile of repayments, and so forth. For this, please turn to the Financial Case which explains the approach to how this is addressed. There are additional factors or approaches that could also be considered in terms of establishing market demand. The ONS publishes data on household wealth and debt (available here). In terms of understanding existing debt burden generally, the figures covering:

- households without any financial debt within the South West region can be accessed using 'Percentage of households with financial debt and summary statistics, by region' (ONS Data, Table 7.5); and
- the number of households with debt but for whom debt is not a problem can be accessed using 'Percentage of individuals with financial debts who find financial debts to be not a problem at all, by region' (ONS Data, Table 7.11)

23.1.5 These give further insights into the number of households where household debt is not a problem, although the regional granularity of the data does not support more in-depth analysis than the LSOA-focused approach used here. Actual customer demand for measures is covered elsewhere in this Business Case so it is not covered in detail here, however there is widespread acceptance of the innovation adoption cycle when bringing new ideas to market. Those most likely to be interested in retrofitting their home using affordable finance include the percentage of population who are: innovators, early adopters and the early majority. The speed of adoption - how quickly a fund such can support more rapid movement through the different customer segments – is what should be tested as part of the pilot scheme.

23.1.6 Regional Level Data

23.1.7 Local Authority Level Data

Figure 18 - Potential spend by local or unitary authority area

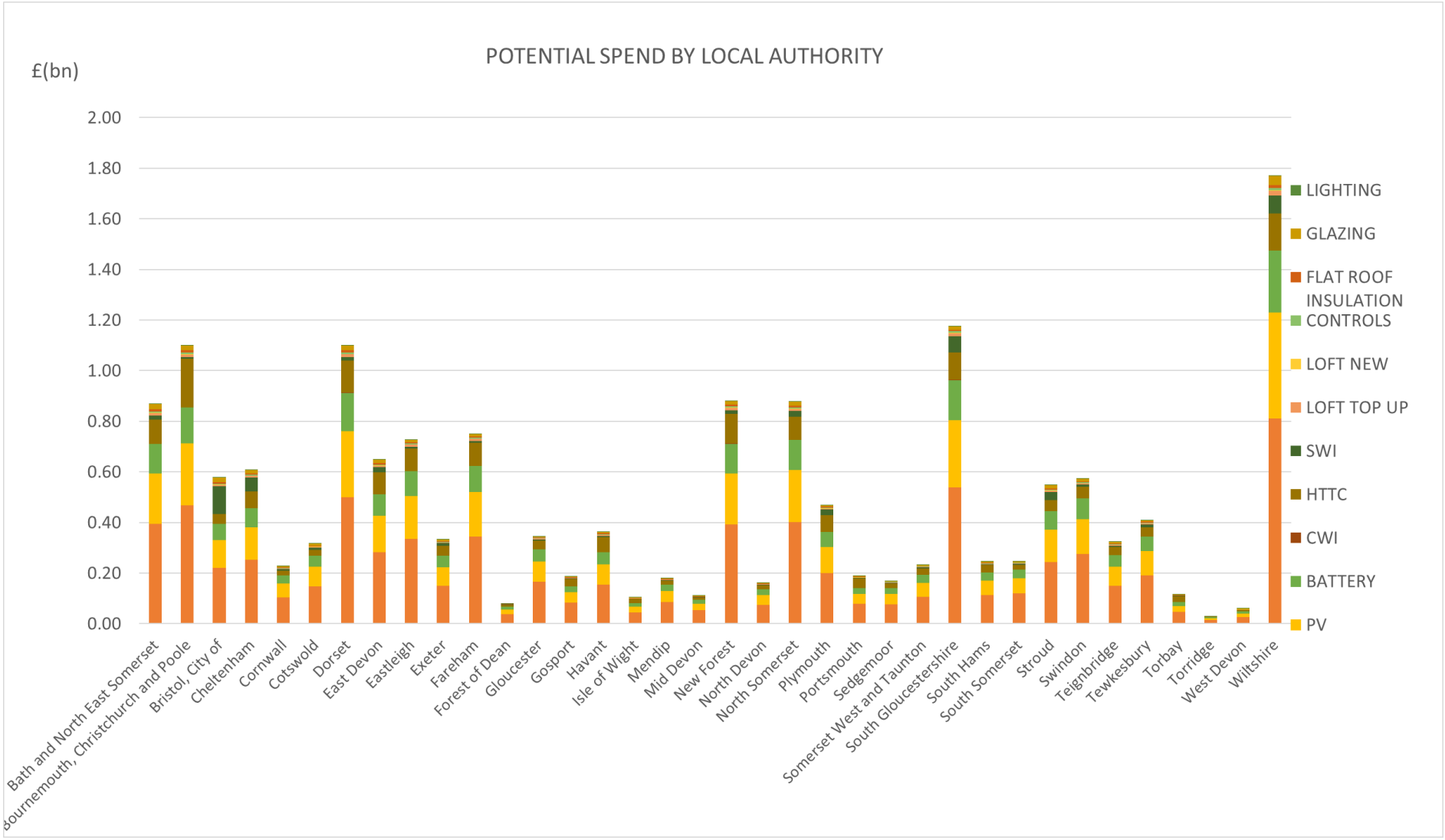


Figure 19 - Potential number of measures by local or unitary authority area

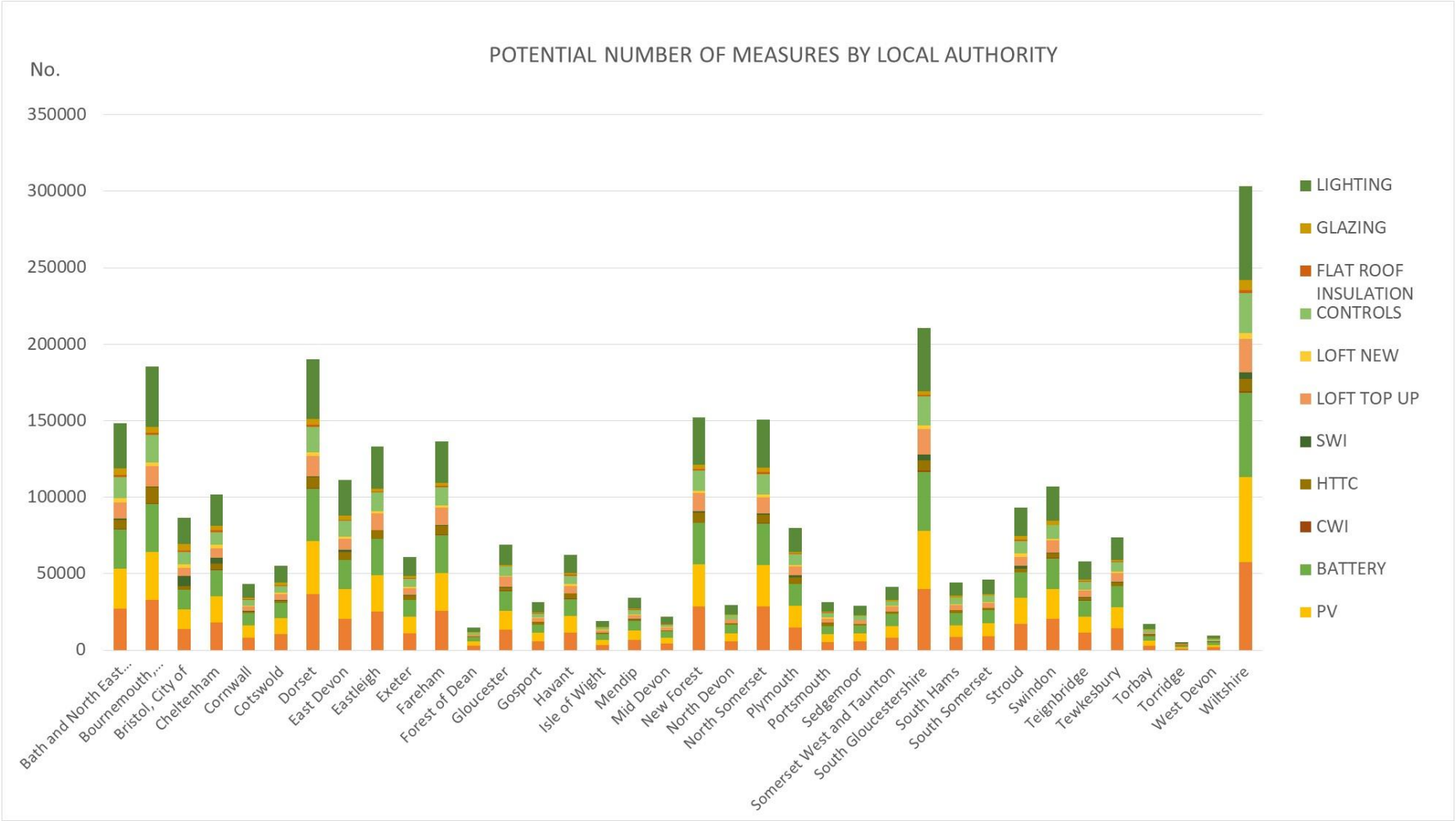
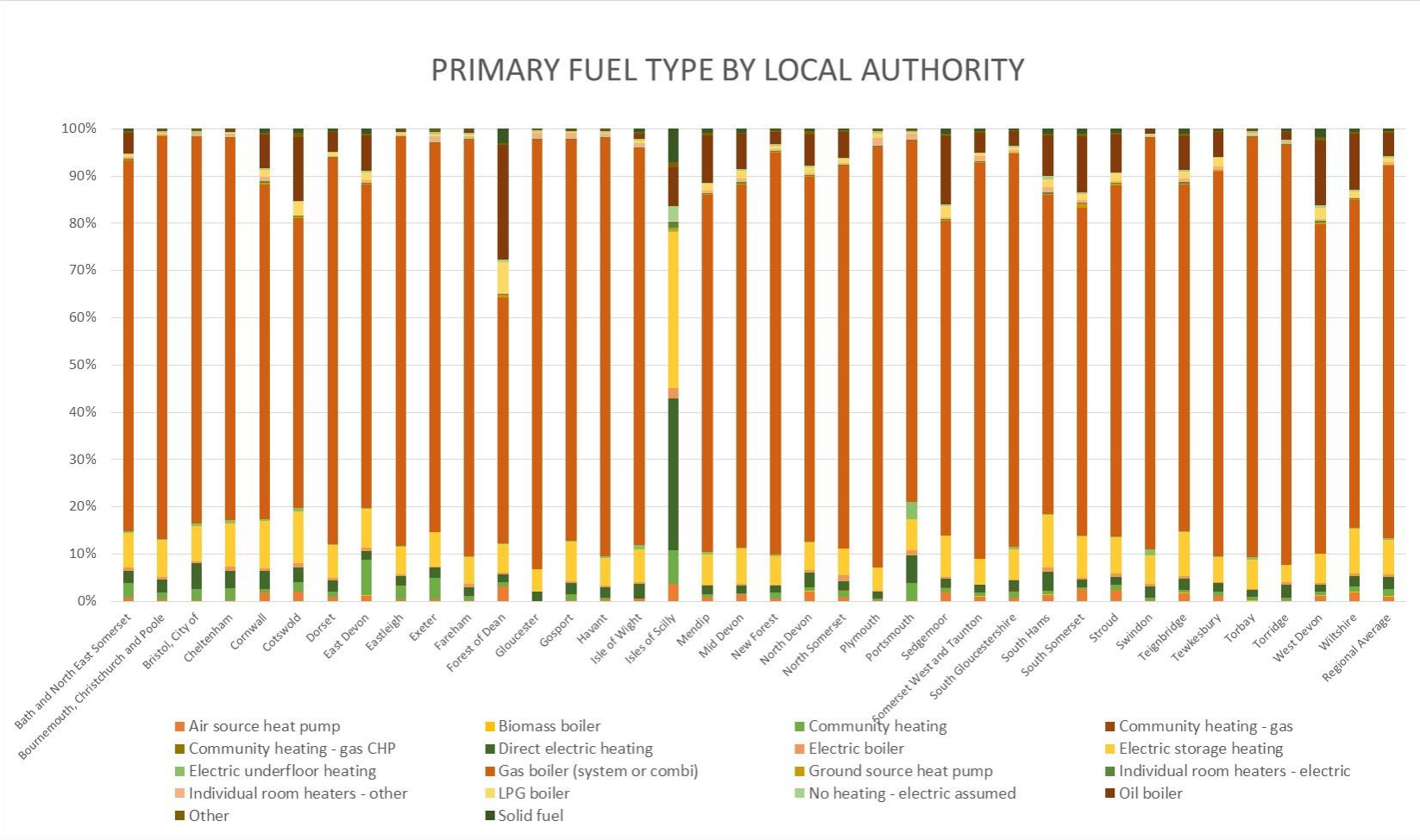


Figure 20 - Fuel type by local or unitary authority area



24 APPENDIX 3: ASSUMPTIONS USED FOR THE ECONOMIC APPRAISAL

General assumptions

Discount rate	3.5%
Heat pump efficiency	280%
Gas boiler efficiency	85%
Oil boiler efficiency	85%
Solar PV export tariff	£0.02 per kWh

Lifetime assumptions

MEASURE/TECHNOLOGY	LIFETIME
Oil condensing boiler	15 years
Gas condensing boiler	15 years
Air Source Heat Pump	20 years
Radiator	30 years
Hot Water Cylinder	10 years
Loft insulation lifetime	42 years
Solid wall insulation lifetime	36 years
Cavity wall insulation lifetime	42 years
Solar PV lifetime	25 years
Battery lifetime	10 years

Capital Costs

HEATING SYSTEM	2022£
Oil boiler 24 kW	£2,770
Oil boiler 30 kW	£3,040
Gas boiler 24 kW	£1,960
Gas boiler 30 kW	£2,230
Air Source Heat Pump 5 kW	£3,810
Air Source Heat Pump 6 kW	£4,030
Air Source Heat Pump 8 kW	£4,680
Air Source Heat Pump 10 kW	£5,470

Air Source Heat Pump 13 kW	£6,650
Air Source Heat Pump 16 kW	£7,220

24.1.1 Where applicable, the following cost elements were also considered in addition to the capital costs above:

(1) Additional fee for swapping a non-combi for a combi (removal of old kit and re-piping)Cost of fittings (pumps, pipe, valves, wiring centre) with margin

(2) Labour fee, including electrician fee

(3) Radiator upgrades

(4) Average cost of an oil store, including piping from store to boiler, including installation with margin

(5) Cost of buffer tank and cylinder with margin

Employment estimations

TIME NEEDED FOR INSTALLATION	WORKING DAYS
CWI installation	2
EWI installation	20
LI installation	1
ASHP installation - engineer	6
ASHP installation - electrician	3
PAS 2035 delivery (retrofit coordinator and assessor)	1.5
Solar PV and battery	2.5
Fossil fuel boiler installation	1
Oil boiler installation	1

25 APPENDIX 4: GEMSERV'S PUBLIC PROCUREMENT: DECISION FRAMEWORK

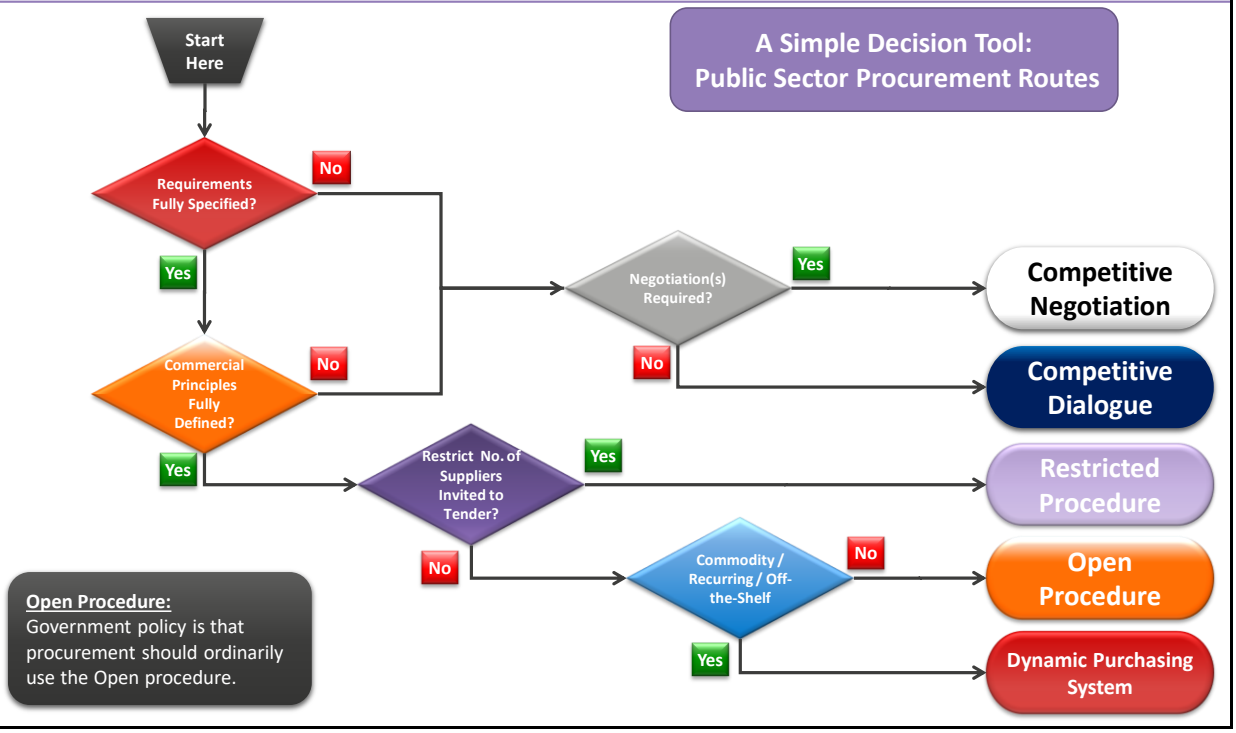
PUBLIC PROCUREMENT: DECISION FRAMEWORK 1

Assumptions in using this Framework:

- No pre-existing frameworks / contracts suitable for procuring the goods or services;
- Pre-Market Engagement activities have been undertaken to confirm, or otherwise:
  - The Requirements (where understood);
  - A market appetite for the project; and
  - A procurement approach;
- Project outcomes are understood and, where appropriate, specified;
- Contractual and commercial arrangements are understood, albeit they may not yet be fully defined or finalised;

1

PUBLIC PROCUREMENT: DECISION FRAMEWORK 2



PUBLIC PROCUREMENT: DECISION FRAMEWORK 3

Pre-Requisites for each Procurement Route, in order to Commence an OJEU-type Procurement

	Open Procedure	Restricted Procedure	Competitive Dialogue	Competitive Negotiation	Dynamic Purchasing System
Selection criteria	✓	✓	✓	✓	✓
Contract documents, including requirements	✓	✓			✓
Award Criteria	✓				

PUBLIC PROCUREMENT: DECISION FRAMEWORK 4

Benefits of each Procurement Route

	Open Procedure	Restricted Procedure	Competitive Dialogue	Competitive Negotiation	Dynamic Purchasing System
Single Stage Process	✓				
Selection provides a manageable number of suppliers		✓	✓	✓	✓
Ability to discuss solutions and commercial terms with all Selected suppliers			✓	✓	
Innovation and innovative solutions may be proposed, which would otherwise be unknown			✓	✓	
Careful negotiation may lead to better value for money				✓	
Commodity, off-the-shelf products or services					✓
Recurring requirements					✓
All qualifying suppliers must be admitted without limit					✓

PUBLIC PROCUREMENT: DECISION FRAMEWORK 5

Risks of each Procurement Route

	Open Procedure	Restricted Procedure	Competitive Dialogue	Competitive Negotiation	Dynamic Purchasing System
No Pre-selection, and all tenders must be evaluated – can become unwieldy if lots of interest	✓				✓
No opportunity to discuss solutions and/or commercial terms with suppliers	✓	✓			✓
Selection/qualification may remove capable suppliers		✓	✓	✓	✓
Insufficient number of suppliers qualify		✓	✓	✓	✓
Can take a long time to reach a solution			✓	✓	
Suppliers' costs can be high and capable suppliers may not bid or withdraw during the discussion period			✓	✓	
Specific rules must be followed, and these will depend on the circumstances of the situation				✓	
Negotiation may lead to impasse or an extended period to reach consensus				✓	

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