A roadmap to decarbonisation

Retrofit of social housing stock in the South of Scotland

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CLES
the national organisation
for local economies

Acknowledgements

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About this report

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Contents

Executive summary

The South of Scotland's first Regional Economic Strategy prioritises creating and sustaining high quality, affordable housing[1]. The strategy also commits to using community wealth building as a tool for delivering an inclusive economy that centres on wellbeing. The decarbonisation of housing stock in Scotland is a key priority for the Scottish Government in its efforts to address the environmental crisis and net zero by 2045. But the challenge to realise this ambition is considerable and will require organisations to find new ways of working together so that the investment can deliver for people across Scotland.

This report examines how these challenges play out in the South of Scotland, and how they are being addressed through the partnership work of South of Scotland Enterprise (SOSE), working with an emergent collaboration of registered social landlords (RSLs) and their partners.

Our research has found that the RSLs in the region have already taken significant steps on their retrofit journey in part driven by regulatory requirements on the energy efficiency standards of their stock. The work that remains is deep retrofit which will be costly and challenging to deliver.

Rural economies like the South of Scotland face particular challenges in terms of delivery of retrofit. Without additional government support, they risk falling further behind urban areas which benefit from more buoyant labour markets and developed supply chains. This report is a call to action to all stakeholders: **with more support something truly transformational can be achieved.**

The economic potential is clear. IPPR have calculated that the following investment is needed to get RSL stock up to the current regulatory standards required by the Scottish Government:[2]

- £62.5m by 2030.
- £168m by 2045.

Retrofitting homes in the South of Scotland could also be **a substantial job creator**:

- By 2030, retrofitting could sustain up to **2,239 direct jobs** within Dumfries and Galloway and the Scottish Borders, of which 335 could come from social housing.
- By 2045, the industry could sustain up to **6,690 direct jobs** within Dumfries and Galloway and the Scottish Borders, of which 1,205 could come from social housing.

[1] South of Scotland Regional Economic Partnership – Regional Economic Strategy, 2021 Read.
[2] These figures are based on 2020 inflation rates and have not been adjusted due to volatility.

- By 2030, retrofitting could generate **£112.5m** in direct GVA, of which £27.5m could come from social housing.
- By 2045, retrofitting could generate **£340m** in direct GVA, of which £78m could come from social housing.

The delivery of retrofit is made more difficult, yet more pressing by the three interlinked challenges of climate, cost and comfort.

- Warm, affordable and healthy homes are essential to wellbeing.
- The need to upgrade the social housing stock in the region has been made even more pressing by the push for net zero and soaring fuel prices.
- Inflation and Brexit have also made the delivery of retrofit more costly and challenging for RSLs.

This challenge also presents a huge economic opportunity for the region and community wealth building to make sure that retrofit work is done in a manner that benefits the local economy.

Recommendations

This report sets out key recommendations which can accelerate the pace of decarbonisation:

1) **Build on existing collaborative working across RSLs (short) –** Galvanise the RSLs around key issues such as the collective understanding of stock, collective recognition of technologies required, commitment to collaboration on materials, upskilling etc. and agree an action plan to take these forward.
2) **Explore the creation of a collaborative body to facilitate delivery of retrofit in the region (short) –** Facilitate co-operation across the ecosystem to build a centre of excellence around rural retrofit. This would provide an example that other rural economies could learn from in time. Expertise can be developed by testing approaches through small scale developments and projects using prototypes not pilots. The centre of excellence can accelerate the delivery of training programmes, provide specialist facilities and support the acquisition of accreditations. It could also support shared apprenticeships which have proved challenging to date.
3) **Strengthen community wealth building asks of large suppliers through collective action (medium) –** Use the collective strength of the RSLs to encourage large suppliers to deliver wider and more lasting socio-economic benefits such as through the establishment of bases in the region, working with colleges to link trainees, apprentices and graduates to work opportunities and pressing for impactful community benefits.
4) **Scale up and secure the financial commitment from the Scottish and UK Governments (medium) –** Use the economic analysis from this work to make a case for long term commitment to investment: pilot and piecemeal funding does not work. It is

Timeframe guidance:

- Short: up to one year
- Medium: one to three years
- Long: three years plus

clear that public intervention is needed to overcome market failures and leverage private investment.

5) **Subsidised or free training courses at local colleges (medium) –** both colleges in the region are already delivering green construction skills courses but uptake is still limited by established firms. This could be overcome by providing free or subsidised courses or on the job accreditations.

6) **Further develop engagement with tenants (ongoing) –** The RSLs have done some degree of engagement with tenants who have been due to receive retrofit works, and have been working with them following installation to monitor progress. This needs to go beyond standard engagement and trust could be enhanced through the use of retrofit champions from the local community. Tenants need to be at the centre of decision making so that any work happens with them, not to them.

KEY FINDINGS

The decarbonisation retrofit of housing is critical in achieving Scotland's ambition to reach net zero carbon by 2045. Registered social landlords have been tasked with leading the charge, with strict regulatory standards placed on the energy efficiency of their stock. In this work, we show that taking a community wealth building approach to decarbonisation retrofit could also create substantial economic benefits to the South of Scotland.

2,239
direct jobs by 2030

6,690
direct jobs by 2045

£112.m
GVA from retrofit by 2030

£27.5m from social housing

£340m
GVA from retrofit by 2045

£78m from social housing

£257m
investment in residential retrofit in South of Scotland by 2030

£62.5m in social housing

£779m
investment 2045

£168m in social housing

2.25% workforce involved in retrofit in Dumfries & Galloway by 2030

2.33% workforce involved in retrofit in Scottish Borders by 2030

1. Introduction

The South of Scotland's first Regional Economic Strategy prioritises creating and sustaining high quality, affordable housing.[3] The strategy also commits to using community wealth building as a tool for delivering an inclusive economy that centres on wellbeing. As key anchor institutions in the region, registered social landlords (RSLs) are critical to making these priorities a reality. This report examines how RSLs in the South of Scotland can be at the forefront of the effort to decarbonise the region's social housing stock in a way which builds community wealth.

This project built on a Scottish Government funded community wealth building pilot conducted by CLES in 2021 which examined the role of the RSLs as anchor institutions in animating the South of Scotland's economy.[4]

The following report outlines further work which was done in partnership with the South of Scotland Enterprise (SOSE) and six key RSLs in the South of Scotland: Berwickshire Housing Association, Eildon Housing Association, Dumfries and Galloway Housing Association (known as DGHP and now part of the Wheatley Group), Loreburn Housing Association, Scottish Borders Housing Association and Waverley Housing. Together these six RSLs provide around 24,000 homes across the region.

CLES's approach

There were three main stages in this work:

- **Semi structured interviews with housing providers** were undertaken to gather data and insights into their decarbonisation work both individually and collectively.
- **Semi structured interviews with stakeholders across the region** were undertaken to understand the wider retrofit ecosystem. A full list of the interviewees is in Appendix 1.
- **A tenants' survey** was undertaken in partnership with the six RSLs to gain some insights about the perspective of tenants. Appendix 2 includes a copy of the survey and an analysis of the responses.

[3] South of Scotland Regional Economic Partnership – Regional Economic Strategy, 2021 Read.
[4] The pilot culminated in a report which was delivered to SOSE and six of the region's RSLs with three key recommendations around addressing procurement practices, building a green local supply chain and breaking down barriers to local supplier engagement.

- **Calculating the scale of the potential economic opportunity** (undertaken by IPPR[5]). The model provides an estimate of economic multipliers that might be expected from investment in retrofit including the direct and indirect job creation, and GVA growth. The model used built off an existing model and was adapted for the context in Scotland. Data for Scotland was extrapolated for the South of Scotland. An overview of this model including key assumptions and caveats are provided in Appendix 3.

The South of Scotland

This report, and the research behind it, is focused on the South of Scotland which comprises Dumfries and Galloway and the Scottish Borders Council areas. The geography of the South of Scotland has been recognised by the Scottish Government in the establishment of SOSE as the Economic and Community Development Agency for the area. Key metrics for the region include:

- The South of Scotland has a population of approximately 264,000 – 5% of Scotland's population.
- There are approximately 134,000 dwellings of varying archetypes.
- The region stretches 250km from coast to coast and holds 15% of Scotland's land mass. It is predominately rural with small hamlets; there are only four towns with over 10,000 residents.
- 91% of businesses have fewer than ten employees. 19% of those in employment are self-employed which is higher than the Scottish average of 12%.[6]

CLES's findings and recommendations

This report works to:

- **Set out** the policy context to decarbonisation in Scotland and the South of Scotland.
- **Explain** how community wealth building can address specific challenges in rural economies.
- **Articulate** the findings from qualitative and quantitative research with stakeholders including RSL tenants.
- **Demonstrate** the economic potential of decarbonisation.

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[5] This work was also inspired by research published by the Institute of Public Policy Research (IPPR) in partnership with the Northern Housing Consortium in 2020 looking at the potential economic impact of decarbonising housing stock in the North of England. We worked with IPPR to adapt their model to map the economic potential of decarbonisation of residential housing stock across the South of Scotland.

[6] The South of Scotland – Key Statistics Source: South of Scotland Enterprise | Operating Plan 2020/21

- **Set out** recommendations for action to move this agenda forward at pace and scale.

The report has an extensive set of appendices including a list of interviewees, the tenants' survey questions and findings, the economic analysis and associated methodology from IPPR and an analysis of the Energy Performance Certificate (EPC) ratings across the region.

2. Policy and place context

Scotland has one of the most ambitious targets to reduce carbon in the world. It has committed to reach net zero by 2045, five years before the rest of the UK and to reduce carbon emissions by 75% by 2030.[7] At the same time, the Scottish Government is developing the world's first Community Wealth Building Bill – a recognition of the need to support local economies to be more fair, generative and democratic.

The ambition to realise carbon reduction with progressive economic policy provides a strong basis upon which to secure a just transition in the South of Scotland. This section explores this and the significant challenges that remain in terms of policy and legislation which must be reconciled alongside the region's needs.

Retrofit and community wealth building

Scotland and the wider UK are standing at the brink of an energy revolution which could transform local places. Local government, public sector organisations and RSLs have a critical role in ensuring this transition is just, by using their economic power to enable community ownership, and support new local supply chains and innovative approaches to energy transition which help wealth to stick in our local places and address social inequality.

Community wealth building is a progressive approach to local economic development which supports the development of fairer, greener local economies which work for people, planet and place.[8]

It uses the spending power, employment practices and assets of anchor institutions like RSLs to stimulate and strengthen local economies. Community wealth building emphasises that anchor institutions play a role that goes beyond the provision of public services and that their economic heft can be used to shape fairer and more inclusive economies.

Community wealth building uses five principles or levers as set out in Figure 1 below.

[7] Scotland to become a net zero society Read.
[8] For more examples see CLES's energy transition toolkit developed in conjunction with Carbon Co-Op A just energy transition through community wealth building, 2022. Read

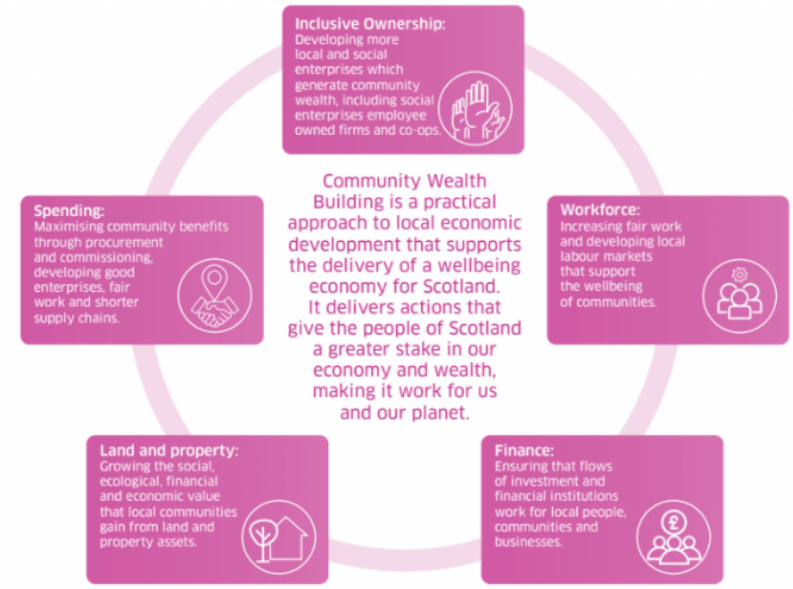

Figure 1: The five principles of community wealth building[9]

The retrofit challenge in Scotland

In Scotland there are currently 2.5m occupied residential properties. These dwellings account for an estimated 13% of Scotland's total greenhouse gas emissions and contribute to around 30% of Scotland's total energy consumption.[10] The actions of public sector partners are essential in making Scotland's Net Zero ambitions a reality.[11] RSLs in particular have a pivotal role in developing carbon neutral homes and retrofitting their housing stock.[12]

The Scottish Government's Housing to 2040 policy states that housing is vital to meeting broader wellbeing ambitions in Scotland such as eradicating child poverty, fuel poverty and homelessness, as well as tackling climate change and promoting inclusive growth.[13] RSLs play a critical role in providing affordable housing across the UK and are key delivery partners in the Scottish Government's wellbeing economy aspirations. In the South of Scotland, the RSLs provide all social housing following stock transfers from local authorities in the 20th century.

There is huge variety in the archetypes of stock held by the six RSLs that participated in this research. This makes the delivery of retrofit work more challenging than in areas with similar archetypes, such as tenements and tower blocks, more commonly found in urban centres.

[9] Scotland Centre for Regional Inclusive Growth, 2021
[10] Heat in Building Strategy – achieving net zero emissions in Scotland's buildings Scottish Government October 2021 Read.
[11] Scotland to become a net zero society Read.
[12] National Housing Federation Policy Blog – How to decarbonise homes Read.
[13] Sottish Government – Housing to 2040 Policy Documents Read.

What is retrofit?

Retrofit is the process of making changes to existing buildings so that energy consumption and emissions are reduced. Domestic retrofit specifically relates to the use of these measures to improve the energy efficiency of, and reduce carbon emissions from, domestic properties.

Domestic retrofit interventions include improving wall and roof insulation, upgrading windows, installing more efficient and low carbon heating systems (such as Ground and Air Source Heat Pumps) and may extend to the installation of renewable energy generation and storage.

The retrofit challenge in the South of Scotland

The energy efficiency of homes in the South of Scotland is particularly poor when compared with Scotland as a whole. According to the Domestic Energy Performance Certificates Dataset Q1 2022,[14] properties in Dumfries and Galloway on average scored a Standard Assessment Procedure (SAP) score of 61.3, while Scottish Borders records an average of 64.9. This equates to an equivalent of an EPC D rating, which is below the Scottish average of 69.3 which is a C rating.

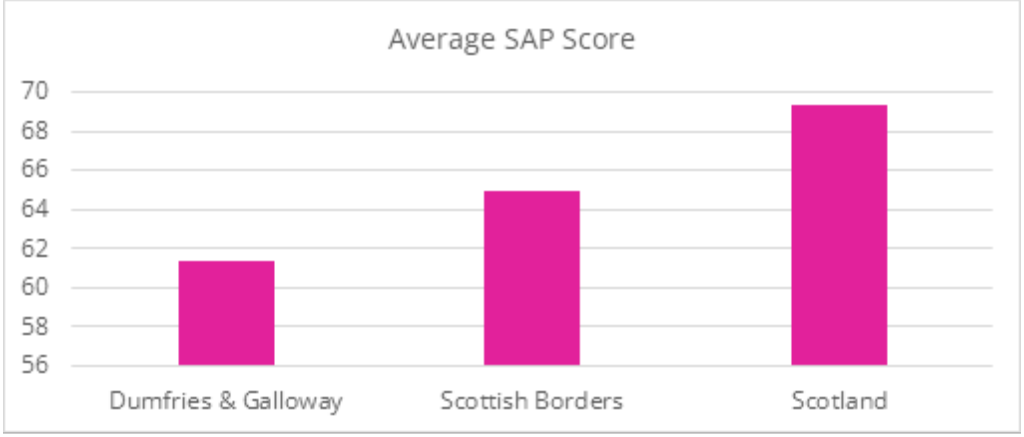

Figure 2 – Average Standard Assessment Procedure Score of residential properties in the South of Scotland. Source: Energy Performance Certificates: introduction - gov.scot (www.gov.scot)

Looking at the distribution of domestic EPC by band rating, it is evident that the South of Scotland has a larger share of E, F and G rated property than Scotland as a whole, and Dumfries and Galloway has a larger share of D rated property. The South of Scotland has a smaller share of A to C rated property compared to Scotland as a whole, as shown in Figure 3 below.

[14] See Appendix 4 for a fuller examination of the energy efficiency of domestic properties in the region.

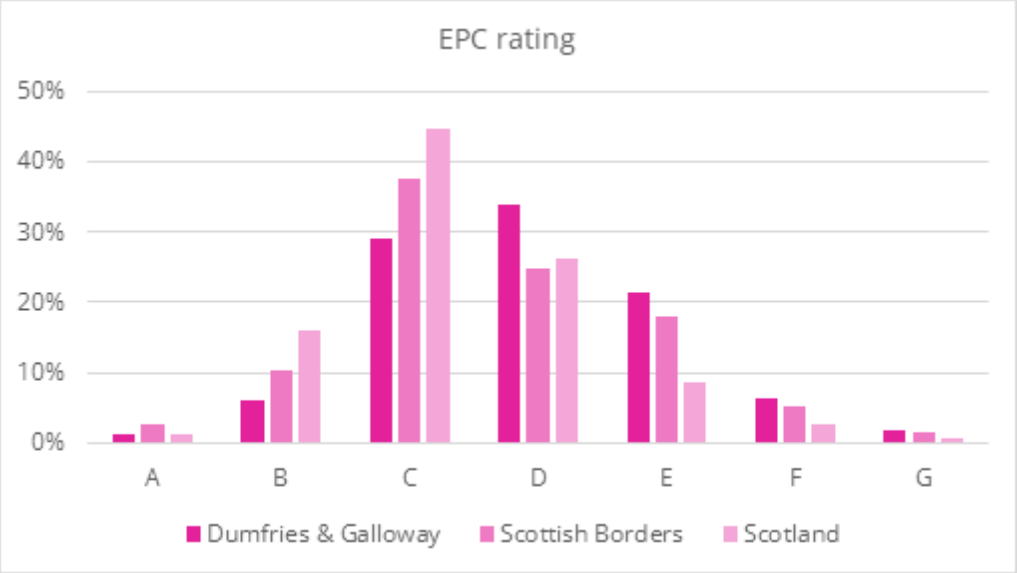

Figure 3 – Energy Performance Certificate rating of residential properties in the South of Scotland and Scotland as a whole.

The challenges for Scottish RSLs and retrofit

Current Regulation

The Scottish Government introduced the Energy Efficiency Standard for Social Housing (now known as EESSH1) in 2014.[15] This placed stricter requirements for energy efficiency on social housing providers than for the private rented and owner-occupied sectors. This regulation has meant that many social homes are amongst the most energy efficient in Scotland, with 85% already achieving EPC D or above.[16]

However, EESSH1 has been the subject of criticism and EESSH2 was brought into effect in 2020.[17] This required all RSL properties to meet EPC D by December 31 2025 at change of tenure, and EPC B by December 31 2032. This regulation means that no social housing below EPC D should be available for new rental in Scotland from January 1 2026. Whilst this has improved the energy standards of social homes, it has created the risk that properties which cannot meet the required EPC standard through retrofit (either through technical limitations or cost) may be offloaded into the private market or demolished.

The Scottish picture aligns with research conducted by IPPR North that has shown that the energy efficiency of social housing stock in the UK is better than for privately owned stock.[18] Unfortunately, regulatory improvements in the social housing sector do not appear to have created a groundswell of action in other tenures, or a significant reduction in cost as retrofit technologies become more

[15] Energy Efficiency Standard for Social Housing (EESSH) Read
[16] Energy Efficiency in Homes, Scottish Government Read
[17] It is worth noting the review of EPC ratings which is coming as the Scottish Government recognises that EPC ratings do not account for carbon reduction or the quality of home – they are mainly based on efficiency in terms of cost.
[18] Northern Powerhomes – A green recovery plan to decarbonise homes in the North. IPPR North 2021. Read.

commonplace. The state has to help shape the market, particularly in rural economies if ambitions around decarbonisation are to be achieved in line with the timescales required.

UK-level slow pace of change

A report published by the UK Parliament's Business, Energy and Industrial Strategy Committee in 2022 was frank that the pace of action across the UK was too slow.[19] They highlighted projections from the UK Energy Research Centre in 2020 which said that one million homes will need to be retrofitted each year for the next thirty years to meet the net zero target by 2050.[20] Nowhere close to this figure is happening. The Committee also noted that the UK has the oldest housing stock in Europe and at present only 1.3% of new housing meets the highest possible energy efficiency standard, although Scotland does have more ambitious targets than England.[21] [22]

Cost

The Scottish Government has committed to at least a £1.8bn programme of investment over the course of the current parliament through the Heat in Buildings strategy.[23] Of this £1.8bn, £200m will be allocated to projects in social housing. Whilst these sound like large numbers, it is clear that this level of public finance is not sufficient to tackle the scale and challenge of retrofitting Scotland's housing stock. Furthermore, ensuring the investment in the delivery of retrofit works reaches local businesses and communities cannot be taken for granted.

Early decarbonisation work can be risky and costly and the public purse needs to provide sufficient seed funding in order to crowd in private investment. RSLs understandably do not feel comfortable passing on costs to tenants or adding further debt to their balance sheets. Alternative forms of funding must be found, if the remaining deep and costly retrofit work is to be achieved to get homes up to EPC B by 2032. This is explored further in Section 4.

Community wealth building, retrofit and RSLs – the need for climate, cost and comfort

The multifaceted nature of housing retrofit in that it can potentially address multiple agendas is both an opportunity and a challenge. The link between warm,

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[19] Decarbonising heat in homes – Business, Energy and Industrial Strategy Committee, UK Parliament, Published February 3, 2022 Read.
[20] Ibid.
[21] Northern Powerhomes – A green recovery plan to decarbonise homes in the North. IPPR North 2021. Read.
[22] The Scottish Government has committed to developing New Build Heat Standards ("NBHS") which will require all new homes and buildings applying for a building warrant from 2024 to use only zero direct emissions heating. They are liaising with the UK Government on a similar requirement for new homes and buildings in England and Wales (to be introduced from 2025). Furthermore, the Scottish Government is aiming for all residential dwellings to meet EPC C or above by 2033 where technically and legally feasible and cost-effective. Read.
[23] Heat in Buildings Strategy – achieving net zero emissions in Scotland's buildings. Scottish Government 7 October 2021 Read.

comfortable and affordable housing and broader wellbeing outcomes is well-understood by policymakers but the current speed of decarbonisation is too slow.

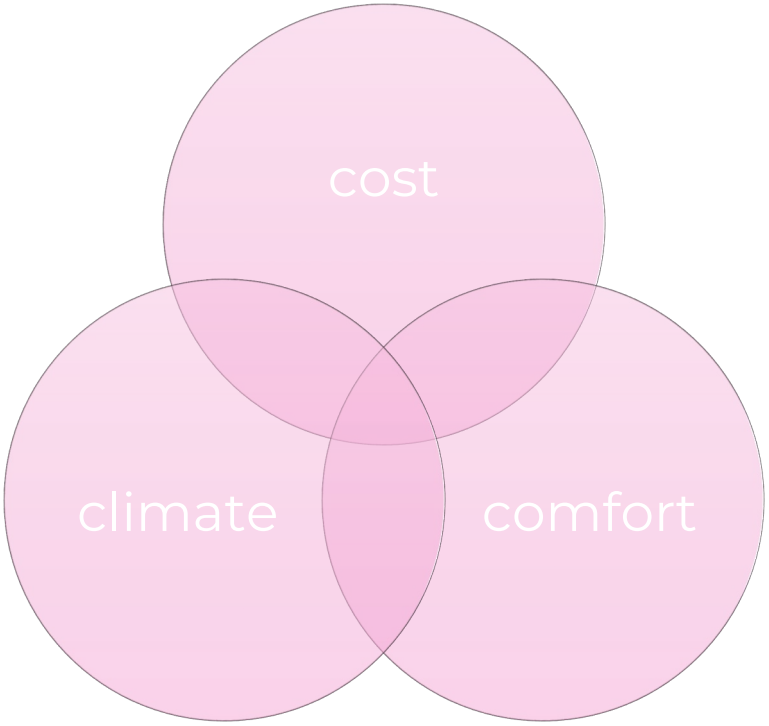


Figure 4 – The three competing challenges of retrofit

Soaring energy prices in 2022, coupled with a broader cost of living crisis, have made action even more urgent. Many households, particularly the poor, elderly and disabled, will not be able to afford to heat their homes and make ends meet. At the same time, the cost of delivering retrofit is soaring and the financial situation of many tenants, landlords and homeowners is becoming more precarious. RSLs and local authorities are seeing their costs rocket and know that these cannot realistically be passed on to tenants. Somehow the triple challenge of climate, cost and comfort must be reconciled.

Retrofit to support Scotland's move towards decarbonisation, and the challenges associated with it, is a clear example of where community wealth building can add value and drive economic benefits back into localities. There needs to be a clear link between the national government strategy and local reality in order to deliver truly affordable warmth and reduce fuel poverty whilst reaching net zero targets.

It is evident that the market will not deliver this without intervention.

Capitalising on the policy context

The Scottish Government has demonstrated its commitment to this agenda through the appointment of a minister, Tom Arthur MSP, with responsibility for community wealth and a manifesto promise to introduce a Community Wealth Building Bill in this parliamentary term. Consultation on the proposed Bill is expected to start in late 2022.

Alongside this, the theme of locality runs through the Scottish Government's Programme for Government with new commitments around local supply chain development, 20-minute neighbourhoods and community wealth building. It recognises that no one model will fit every part of Scotland and it is vital that communities, public services and businesses are involved in designing and building their local economic and community wealth building solutions.

Additionally, the South of Scotland was the first region in Scotland to commit to using community wealth building as a tool for delivering an inclusive economy in their Regional Economic Strategy. In particular, community wealth building can support the region's wider commitment to a just transition by presenting an opportunity to support local economic development through retrofit work, particularly around job creation, skills development and business growth whilst tackling the climate emergency.

The need to support and strengthen the local business base

CLES's work has shown that locally owned and socially minded enterprises are more likely to employ, buy and invest locally, meaning they are both more financially and socially generative. Small and micro firms in the construction sector and social enterprises that support them can foster the development of community wealth by enabling wealth created by users, workers and local communities to be held by them, rather than flowing out as profits to distant shareholders. It is imperative that they get a fair share of the investment being made into retrofit.

Small and micro firms dominate the UK's construction sector and the South of Scotland is no exception. Research by the Southern Uplands Partnership has shown that the current business base cannot deliver the scale of work needed in the region but that does not mean they cannot be supported to do more.

RSLs as anchor institutions

In the South of Scotland, whilst the RSLs are first and foremost providers of affordable and secure homes, they are also significant actors in the economy. As anchor institutions they understand their role as employers, asset holders and buyers of goods and services.

This project recognises RSLs as major anchor institutions, and the important role they play in the South of Scotland. Community wealth building has a particular focus on the activities of anchor institutions, which are large public, and social sector organisations which have a significant and immovable stake in a place. They are place-makers and can have a huge influence on the local communities in which they operate. Nonetheless they cannot do this alone. They form part of a wider ecosystem.

The following section of this report sets out the economic potential of this agenda and Section 5 examines how the retrofit ecosystem is working in the region.

3. The economic opportunity of housing retrofit

The RSLs across the South of Scotland have significant potential to create and shape the market for housing decarbonisation with potential supply chain and employment benefits which go beyond social housing in the longer term. As noted above, the region's RSLs provide around 24,000 homes. They are key anchor organisations in their own right as buyers, employers and asset holders. Collectively, they have considerable spending power; for example, in terms of maintenance alone, six of the RSLs spend more than £66 million annually on maintenance [24].

Headline figures

The economic analysis (conducted by IPPR for this report[25]) provides a further indication that the opportunity of collaborative action by RSLs and other stakeholders in the South of Scotland could deliver significant economic benefits to the region. This analysis provides a glimpse of the potential economic opportunities which could be released in the South of Scotland.

- By 2030, the modelling suggests that investment in retrofit (energy efficiency and low-carbon heating) could sustain up to **2,239 direct jobs** within the South of Scotland (Dumfries and Galloway and the Scottish Borders) of which 335 could come from social housing.
- By 2030, retrofitting could generate **£112.5m** in direct GVA, of which £27.5 million could come from social housing.
- By 2045, the modelling suggests that investment in retrofit (energy efficiency and low-carbon heating) could sustain up to **6,690 direct jobs** within Dumfries and Galloway and the Scottish Borders, of which 1,205 could come from social housing.
- By 2045, retrofitting could generate **£340m** in direct GVA, of which £78 million could come from social housing.

[24] These figures were provided by the six RSLs to SOSE in 2020.
[25] See Appendix 3 for the full economic analysis and methodology conducted by IPPR.

Minimum investment required to deliver economic benefits

In order to achieve these benefits, the analysis suggests that a minimum of **£62.5m million** would be required by 2030 and **£168m** by 2045 to get RSL stock up to the current regulatory standards required by the Scottish Government.

Illustrating the opportunity for the local market

If investment is secured, and the recommendations within this report adopted, we could expect local suppliers to capture a significant chunk of this market. The exact figure will depend on the actions of the many organisations involved in the retrofit ecosystem – from the RSLs through to government, local colleges and investors.

There are significant predicted benefits if local suppliers could capture a third of the market.

- By 2030, the modelling suggests that investment in retrofit could sustain up to **746 direct jobs** within the sector, of which 112 could come from social housing.
- By 2045, the modelling suggests that investment in could sustain up to **2,230 direct jobs** within the sector, of which 581 could come from social housing.
- By 2030, local suppliers could generate **£37.5m** in direct GVA generated by retrofit, of which £9.1 million could come from social housing.
- By 2045, local suppliers could generate **£113.3m** in direct GVA generated by retrofit, of which £26 million could come from social housing.

How the economic analysis was calculated

The economic analysis presented in this research draws on investment modelling undertaken by Element Energy for the Climate Change Committee's Sixth Carbon Budget for Scotland[26] which looks at investment cost of retrofitting Scotland's homes to meet net zero targets.

The model explores the investment required, job creation potential and GVA effect of deploying the following technologies in line with net zero targets. These technologies include:

- energy efficiency products (e.g. loft and wall insulation);
- energy saving controls (e.g. temperature controls);
- low-carbon heating (heat pumps);
- low-carbon district heating (heat networks).

[26] Development of trajectories for residential heat decarbonisation to inform the Sixth Carbon Budget (Element Energy) – Climate Change Committee Read.

The analysis uses multipliers based on Standard Industry Classification (SIC) code categories to understand the potential job creation and GVA uplift which could be produced from investment in housing decarbonisation in the region. It also takes a fabric first approach and therefore frontloads investment in energy efficiency products (which also explains why there is little to no change in job creation in that sector between 2032 and 2045).

Further detail on the methodology is provided in Appendix 3.

Job creation

Retrofitting homes in the South of Scotland could also be a substantial job creator as shown in the headline figures above. This would add considerable value to the region's economy. The rurality of the South of Scotland and high levels of fuel poverty mean that there is even greater job creation potential as shown in the maps on figures 5 and 6. This is because much of the decarbonisation cannot be delivered by district heating systems (as might be the case in urban areas) and will require more labour-intensive individual interventions on properties, such as insulation and heat pumps as shown in figures 7 and 8 below. Furthermore, there is a significant employment opportunity that comes with the installation of new technologies like heat pumps. In time, this also stimulates further markets for repairs and ongoing maintenance. The figures reflected in the analysis include projected figures for both adoption and maintenance of retrofit upgrades.

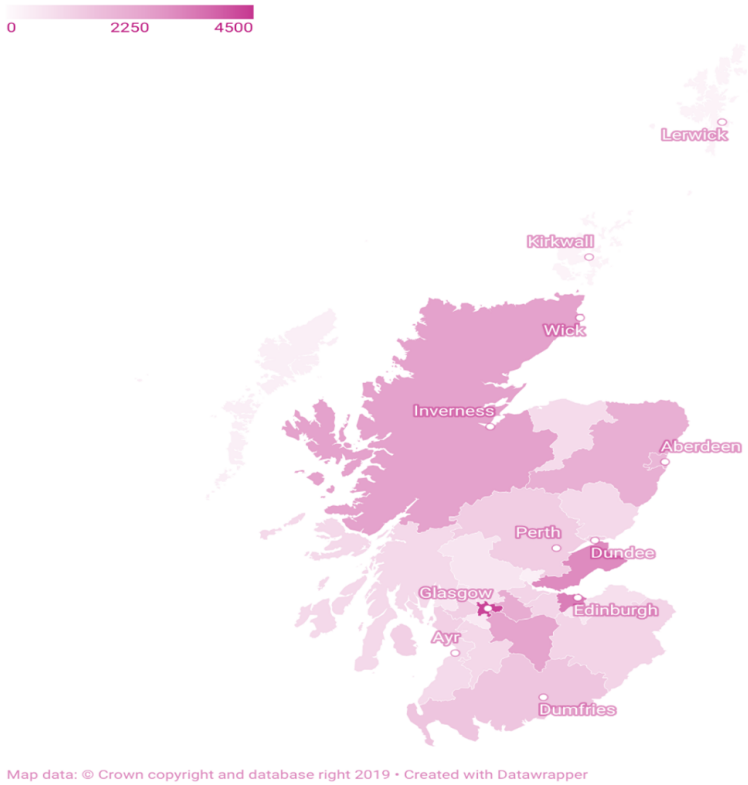


Figure 5: Retrofitting jobs (direct) adjusted by fuel poverty and population density by 2032.

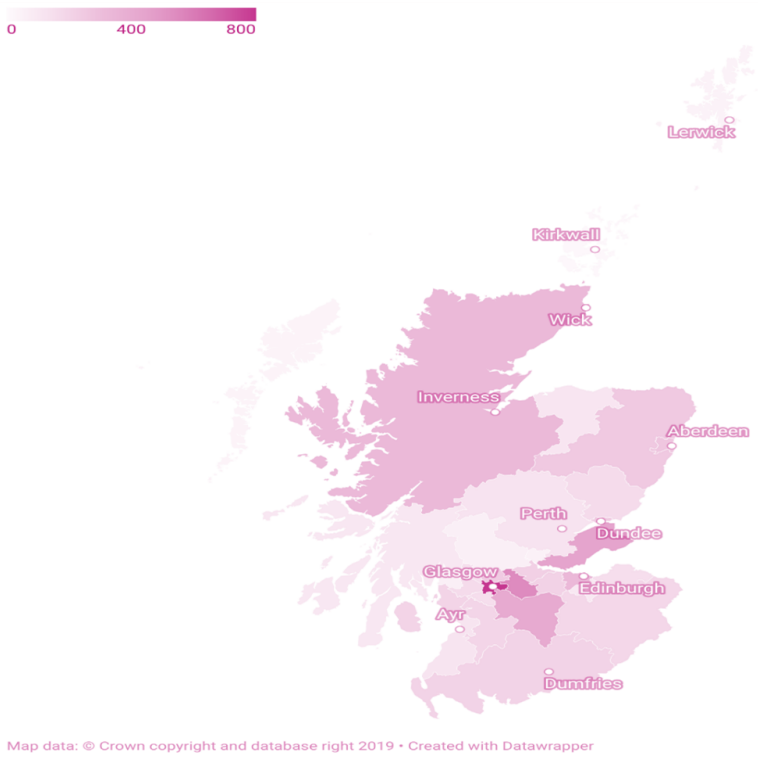


Figure 6: Retrofitting jobs (direct) adjusted by fuel poverty and population density by 2045.

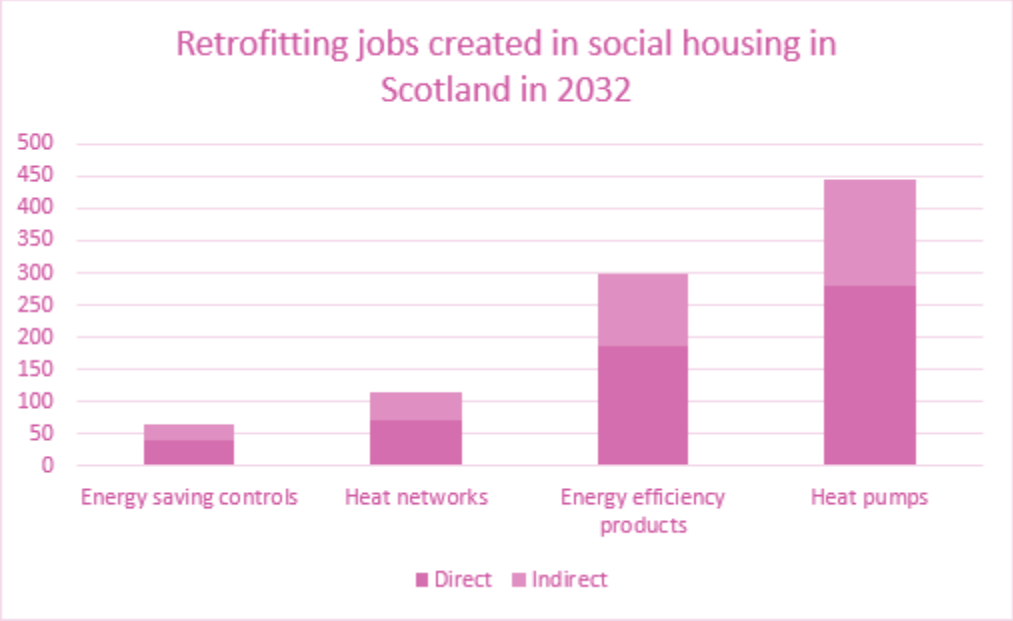


Figure 7: Projected jobs created by technology in social housing in the South of Scotland by 2032

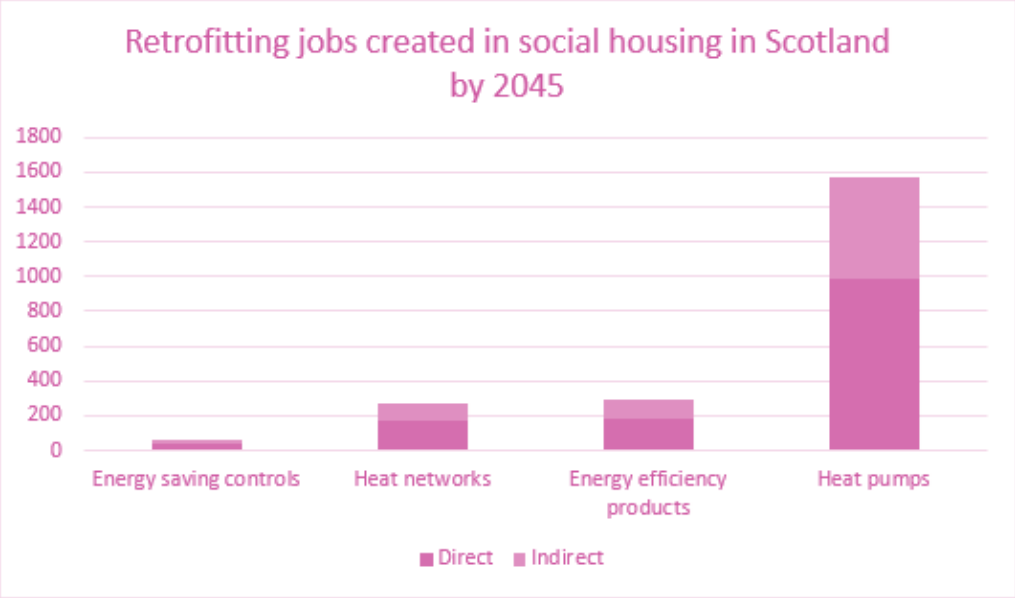


Figure 8: Projected job created by technology in social housing in the South of Scotland by 2045

4. The retrofit ecosystem

We interviewed a range of stakeholders in the region through this project – including the six RSLs, representatives of the two local authorities, the colleges and public sector agencies including SOSE – and conducted a survey of tenants to understand the retrofit ecosystem. [27] [28] We found considerable commitment to the retrofit agenda and a desire to use community wealth building to deliver lasting economic benefits to the region. We also heard that this ambition can be delivered faster and more effectively with more support and co-ordination. We set out our key findings below.

The RSL response

The RSLs have enthusiastically taken on the challenge of retrofit to meet regulatory obligations. Pretty much unanimously, the RSLs have met the EESSH1 targets and very few have properties under EPC rating D. Where these properties exist, they are usually pre-1919 builds. Several of the RSLs are assessing whether it is worth keeping these properties, with some considering disposal of units due to their inability to let the properties if retrofit measures are prohibitively expensive or technically impossible.

Delivering retrofit to meet EESSH1 has been very costly and challenging. They were all clear that they do not see how they can deliver the next stage of work without more financial support. The regulatory requirements imposed on the RSLs to upgrade their housing stock thus far have been challenging to meet but have spurred action. The RSLs experience shared but not uniform challenges in the delivery of retrofit:

- The rural nature of the region means that there is a wider variety of housing archetypes across the RSLs located in small towns and villages. This makes the delivery of retrofit more costly and challenging compared to urban properties.
- DGHP and Scottish Borders Housing Association received the bulk of their stock from local authority stock transfers. They have the most units and some of their stock is old and will be very challenging to upgrade.

[27] Appendix 1 lists the stakeholders interviewed as part of this work.
[28] Appendix 2 sets out the tenant survey questions and findings.

- Loreburn and Eildon generally have newer stock and have invested in some passivhaus standard properties.

- Waverley is the smallest RSL. It has a Direct Labour Organisation (DLO) that provides services to some of the other RSLs in the region.

- Berwickshire Housing Association has its own windfarm – The Fisherman Three[29] which is run jointly with Community Energy Scotland. It aims to generate around £20m for the RSL over the next 25 years, funding the development of 500 new homes. It will also power 5,900 households and save 12,000 tonnes of carbon dioxide emissions.

- Other than Berwickshire, the RSLs said they do not want to become energy providers but recognise the value of heat networks.

- There are examples of collaboration between some of the RSLs including joint ventures around purchasing services but this has been the exception rather than the norm.

- The greatest challenge however was the lack of financial support. The RSLs all feel caught in an unenviable situation – retrofit must happen to deliver warm and healthy homes and address the climate emergency but costs are rising which cannot be passed onto tenants. The lack of local supply chains makes the cost of delivery even more challenging, with inflation exacerbating both of these issues.

The majority of the RSLs are working to define their exact requirements in relation to the technologies they need to install for retrofit. The key challenge they face is mapping the funding required versus the funding they have access to in order to signal the potential for work and investment to the market. Most of the RSLs are considering deeper retrofit measures like installing solar and air source heat pumps throughout relevant properties. They have a clear understanding of what they need and the technology exists.

Simultaneously to this, the big problem flagged by Eildon and DGHP was the inadequacy of the current energy system. DGHP are working with Scottish Power Energy Networks (SPEN) to address this, and also highlighted that heat decarbonisation options like heat networks are not as relevant for their stock as they are more suited to urban environments and properties such as tenements or tower blocks. DGHP also highlighted that they are not in conversation with Dumfries and Galloway Council in relation to the Local Heat and Energy Efficiency Strategy (LHEES). Scottish Borders also have an LHEES and it is not clear if the RSLs have been involved in discussions around it.

Some of the RSLs are struggling to quantify the costs of retrofit for their properties as a whole. However, many have carried out smaller scale pilot projects or works on the properties most likely to benefit from energy efficiency measures (e.g. homes still using solid fuel).

[29] Our community windfarm – The Fisherman Three – Berwickshire Housing Association Read.

The wider ecosystem

It is evident from conversations with wider stakeholders that in many respects there is a supportive ecosystem in place. Crucially, the retrofit of homes in the South of Scotland is a priority in the regional economic strategy. The region is developing a clearer plan of how to achieve retrofitting goals and there is a lot of activity across different sectors but more cohesion and collaborative working is needed to seize and share the wider economic potential.

Some consistent themes emerging from our consultation include:

1) The need for more support from the Scottish and UK's Governments, both financially and strategically. On funding constraints, there have been various government-funded grant programmes from the Scottish and UK governments (such as the Social Housing Decarbonisation Fund) to support retrofit work which have been widely viewed as failing to meet the challenge in scale and delivery.

    - From the perspective of the RSLs, the funding has been insufficient leaving to them having to make hard choices to cover the shortfall such as raising rents, scaling back the ambition of retrofit or other modernization programmes or adding debt to balance sheets.
    - For the organisations contracted with the delivery of retrofit work, the additional administration required to engage with government-supported programmes can be off-putting for smaller enterprises, as any formal tendering or contracting process can be, as this is often not part of small and micro firms' usual day-to-day operations which tend to run on informal relationships.[30] There is also considerable mistrust due to the failure or withdrawal of previous "green" initiatives by various governments.[31] Tradespeople could pay to upskill, only for the funding to be suddenly withdrawn, leaving them out of pocket.
    - Similarly, in order to build curricula and recruit teaching staff, the colleges need a clear signal that there will be sufficient interest from the tradespeople and individuals looking to develop skills or a career in this field.

2) The importance of good communication with the construction sector. They are critical to the delivery of the work and must be involved in decision-

[30] Sherratt, F., Ivory, C., Sherratt, S. and Crawley, S. (2021) Organising construction work: a digital and cooperative way forwards for micro-projects, Building Research and Information, DOI: 10.1080/09613218.2021.2012118; Simpson, K., Murtagh, N. and Owen, A. (2021). Domestic retrofit: understanding capabilities of micro-enterprise building practitioners. Buildings and Cities, 2(1), pp. 449–466.

[31] Gardiner, J. (2015) 'The Green Deal: A catastrophe from start to finish', Building Magazine, 7th August 2015; Gooding, L. and Gul, M.S. (2017) Achieving growth within the UK's Domestic Energy Efficiency Retrofitting Services sector, practitioner experiences and strategies moving forward, Energy Policy, 105, 173-182.

making. This is supported by the findings of a separate piece of work with the Southern Uplands Partnership.

3) Private sector construction work is currently buoyant in the region. It is hard to attract small firms and sole traders away from private contracts in traditional sectors to delivering retrofit work which may require new skills, innovative technologies and different materials. In particular, public sector contracts require more paperwork which can put smaller firms off tendering and delivering. This is not necessarily alleviated through sub-contracting and may in fact put small firms off by the perception their contributions are not be properly recognised and remunerated.

Colleges and skills

Colleges and the role of further education are a critical component of a progressive approach to retrofit. During our consultation, we found an eagerness and recognition of opportunity in this agenda, but an inability to offer the holistic retrofit skills package to the market. There were several key reasons for this that are explored below.

In the first instance, colleges consulted highlighted the need for better facilities to conduct some of the required retrofit training, such as an insulation programme. Dumfries and Galloway College raised the possibility of using an unused property in the centre of Dumfries to create an innovation and skills centre where both college attendees and construction workers can go and learn the required skills for retrofitting, while Greg Steel from Scottish Borders College mentioned how they were currently looking at the possibility of using a carpark at one of their campuses to develop a retrofit training centre.

There are also issues around releasing staff to acquire qualifications to teach retrofitting skills, as both colleges are at a capacity for teaching. Releasing staff requires bringing in supply staff and when they return, they might not have the time or capacity to develop their skills. It is particularly hard to recruit people in the further education sector when the construction industry is buoyant. Furthermore, CLES heard it is difficult to get individuals to upskill when industry is buoyant as they can get consistent work in traditional sectors, and the uptake of upskilling is also much higher when it is free.

The South of Scotland has been looking at shared apprenticeships but there is little faith these are applicable to the area and market make up, in large part because of the large number of micro-sized construction firms. We heard from Dumfries & Galloway College that shared apprenticeships do not work due to different micro-employers having different specialisms, thus being unable to provide a comprehensive apprenticeship offer. This means that an apprentice might not be able to gain qualifications as they could be in a position where they have not demonstrated all the required skills. Scottish Borders College were slightly more optimistic and believed they can work if there is greater involvement of business, so they have a more collective voice.

Finally, we heard from both the colleges and RSLs that there needs to be a clearer strategy from the Scottish Government around retrofit qualifications and a clearer path of how skills will be used. Individuals can qualify with retrofitting qualifications and then not use them. This needs to be addressed.

Tenants Survey

As part of this project, we worked with RSLs in the South of Scotland to undertake a survey with tenants. This was designed to provide a snapshot of tenant views and perceptions of housing retrofit from their perspective. Findings from other research across the UK has highlighted the importance of tenant engagement and participation in the efforts to deliver a just transition.[32]

The survey was circulated to tenants via RSLs, eliciting 238 responses. Given the small sample size, the findings are purely indicative. In addition, the survey was circulated during July and August 2022 when concern was rising about the energy market and cost of living crisis and this will have undoubtedly influenced the findings below. Full details of the survey results are provided in Appendix 2 but key findings are summarised below:

Key priorities

We asked tenants to rank various matters including the cost of heating, the impact on the environment and access to public health and transportation by importance to them.

- The responses showed the cost of heating as the most important for tenants given the choices. 54% of responders ranked it as the most important and 77% placed it within the top three considerations.
- Responses also showed that the warmth and comfort of their home is a key consideration – 72% placed it as one of three most important matters (only 16% as the top priority though). However, comparison with the results for the cost of heating suggests that tenants are willing to trade the warmth and comfort for the cost of heating.
- Benefitting the local community by job creation and access to local public transport also appear to be less of a priority – 46% and 60% of responders ranked them respectively as one of the three least important matters. The can be largely explained by the cost of living crisis and more individualistic concerns surrounding the rise of prices.
- The survey shows very divided attitudes towards the impact on the environment. 39% of respondents placed it within the top three most important matters but 32% within the three least important.

Prioritising the use of resources

We asked tenants their views on whether they wanted the money they spent on heating to support their community through measures such as providing heating

[32] One example is The Social Housing Tenants' Climate Jury Report from July to September 2021. This was led by the Northern Housing Consortium. Read.

and energy to local buildings like schools and community halls. This resulted in split answers as shown below.

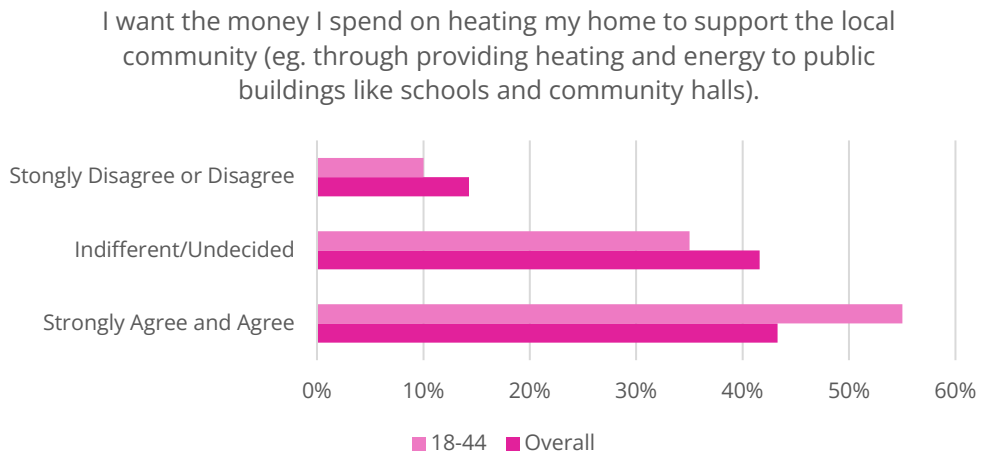


Figure 9: Degree of agreement with reinvestment of money to support the local community

Tenant voice

One of the objectives of the survey was to provide the RSLs with an insight on how confident tenants were in understanding what needs to be done and what information they need to make informed choices.

Most of the respondents at least agree that they want a say in how the area moves towards greener energy (62%) and would like to understand the impact of their heating on the environment (60%).

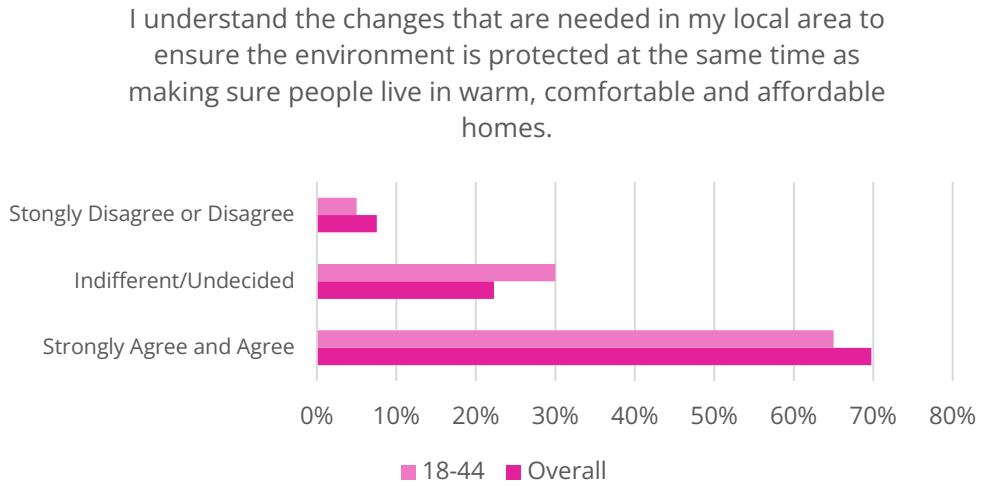


Figure 10: Degree of understanding with changes required to ensure the environment is protected

70% responded that they understand the changes that are needed to be both environmentally friendly and ensure the comfort of community members. Only 8% do not think they understand it. The younger group is only slightly less confident with 65% claiming they understand what needs to be done.

Additional support

We asked what resources were needed to make more informed decisions. 51% said they need flyers explaining what's needed to improve their home's energy efficiency and 46% said they need online resources. Events about energy efficiency, a citizens' assembly and conversations with specialists were mentioned by around a quarter of respondents. Multiple answers were permitted.

Moving forward

This chapter has shown the scale of activity and interest in this agenda in the South of Scotland from anchor institutions, tenants and broader stakeholders. It is clear that the RSLs, their tenants and their homes sit at the centre of an active and supportive retrofit ecosystem. But this activity needs greater co-ordination and focus to meet the scale of the decarbonisation challenge at the pace needed. The next section sets out several recommendations to make this a reality.

5. Recommendations

The RSLs have already undertaken a significant amount of decarbonisation retrofit work but with more targeted support, the South of Scotland can do something truly transformational that delivers warm homes and improved wellbeing alongside economic benefits. There is a considerable shared ambition to this agenda across the South of Scotland from the local authorities, colleges, SOSE, the RSLs and other stakeholders. There is an opportunity to harness this commitment into accelerated delivery. We set out below four key recommendations to make this a reality.

1) **Build on existing collaborative working across RSLs** – Each of the RSLs are facing challenges around rising costs, supply chains and labour and skills shortages. There is potential for improved collaborative working across the RSLs by galvanising action around key issues such as the collective understanding of stock, collective recognition of technologies required, commitment to collaboration on materials, upskilling etc.
    a. In the first instance, all RSLs should consider following the Scotland Excel framework, as not all those consulted do at present. The framework should be cross-referenced with CWB principles, then work should commence to augment the framework to align with CWB objectives. If the RSLs could adopt the same framework and agree a priority action this could create a groundswell of activity that would also stimulate the wider retrofit market.

2) **Explore the creation of a collaborative body to facilitate delivery of retrofit in the region** – There is broad and keen support for this agenda in the region but right now the activity lacks co-ordination. To do something transformational, the region needs institutional buy-in at scale from the local authorities, colleges and other stakeholders. Co-operation across the ecosystem could be facilitated to build a Centre of Excellence around rural retrofit that other areas could learn from in time.
    a. The Centre of Excellence could accelerate the delivery of training programmes, provide specialist facilities and support the acquisition of accreditations by current trades. It could test approaches through small scale developments and projects using prototypes not pilots. This body could also co-ordinate the provision of shared apprenticeships which have proved challenging to date by bringing interested employers together.
    b. CLES recommends that the Centre also employs a financial expert on the retrofit landscape as this was identified as a gap in the knowledge and skills of those working on this agenda. This person

could work to streamline funding efforts across the Centre and help smaller stakeholders navigate the landscape.

c. By creating a Centre of Excellence there is an opportunity to develop skills, scale up delivery and address potential funding shortfalls. Creating this as a premises could utilise vacant or derelict land, such as shops no longer used on high streets like the Midsteeple Quarter in Dumfries. This could create a leading, vibrant hub in Scotland where people can learn about retrofit, gain new skills and meet in person to discuss challenges and opportunities. A physical hub may prove prohibitively expensive, and if so options for a virtual hub should be explored. A virtual hub also would have the benefit of the capacity to host physical events in different parts of the region.

d. The rural geography of the South of Scotland makes the delivery of many products and services more costly and cumbersome. This presents an opportunity to promote a small-scale collaborative approach to place-based retrofit (street by street/collaboration around a specific neighbourhood or village). This Centre of Excellent could test new approaches through small scale developments and projects through prototypes not pilots.

3) **Strengthen community wealth building asks of large suppliers through collective action** – The existing local market cannot currently deliver retrofit at the scale, pace and quality that is needed. In order to meet net zero commitments, and despite the difficulties in the current climate discussed in the report, RSLs must ensure that their spending with large suppliers creates lasting gain for local places.

   a. This can be done by using the collective strength of the RSLs to encourage large suppliers to deliver wider and more lasting socio-economic benefits such as through the establishment of bases in the region, working with colleges to link trainees, apprentices and graduates to employment opportunities and pressing for impactful community benefits.

   b. An initial stage to this process would be a memorandum of understanding with identified suppliers, designed and signed by RSLs. This would focus on promoting a CWB model and could work with appropriate industry bodies to establish a CWB retrofit certification scheme, for example. This would act as an incentive for suppliers to gain certification and also be a vehicle through which to showcase responsible business practices.

4) **Scale up and secure the financial commitment from the Scottish and UK Governments** – Residential retrofit is expensive but also represents a significant economic opportunity. There is a clear case for greater funding to both deliver the scale of retrofit needed and stimulate market interest.

   a. To fund the next stage of decarbonisation without public sector support, the RSLs face three unattractive choices – raising rents on social housing tenants in a cost of living crisis, scaling back their retrofit ambitions or adding debt to balance sheets in a time of

rising interest rates. To achieve decarbonisation on the scale needed, a clear signal is needed from the public sector that they are committed to shouldering the burden with a long-term commitment to investment; pilot and piecemeal funding does not work. It is clear that public intervention is needed to overcome market failures and leverage private investment.

b. To ensure maximum uptake, the funding should be not tied to specific decarbonisation technologies.
c. A clear signal of secure and sufficient funding will also galvanise the trades and other enterprises who are critical to the delivery of retrofit but they must be assured of a fair share. The failure or withdrawal of previous green financing initiatives have left trades sceptical of new programmes or skills provision. This funding if deployed through community wealth building principles can deliver jobs and training and set the South of Scotland at the forefront of the just transition.

5) **Subsidised or free training courses at local colleges –** Both colleges in the region are already delivering green construction skills courses but uptake is still limited by established firms. This could be overcome by providing free or subsidised courses or on the job accreditations .

6) **Further develop engagement with tenants -** The RSLs have done some degree of engagement with tenants who have been due to receive retrofit works, and have been working with them following installation to monitor progress.
    a. In comparison, there has been limited work on behavioural change. More is needed in this sphere, particularly in terms of amplifying successes to other tenants. There is a potential role for retrofit champions who can speak about their experience of using new technology and the difference it has made to their costs and comfort. Central to community wealth building is that decisions are made are made to benefit local people. As a result, any work needs to be in collaboration with tenants and local people to make sure that change happens with them, not to them. Not only does this co-creation of policy make decision making more democratic, it can also improve the quality of it.

6. Conclusion

Decarbonisation of residential housing is a national priority but there is a significant risk that rural economies lose out in the competition for resources and labour. The commitment to using community wealth building to address the retrofit challenge in the South of Scotland represents an opportunity to do something truly transformational and for the region to position itself at the forefront of the net zero agenda. The RSLs in the South of Scotland have done what they can but they need more support, both strategic and financial, from the wider ecosystem to unlock the substantial economic opportunities of retrofit in a way that improves the wellbeing of residents.

There is a choice. The region's anchor institutions can choose to rely on traditional approaches which have not delivered thus far. Or they can lay the foundations for an approach to retrofit that builds community wealth and retains investment so that it benefits local people, enterprises and communities.

Fixing a system before it is established is easier than trying to change it once it is embedded. The South of Scotland has an opportunity to seize that can maximise the social, economic and environmental benefits of retrofit and deliver the just transition. The three challenges of climate, cost and comfort make this an imperative. There is a supportive regional ecosystem in the South of Scotland but this must be galvanised through improved partnership working to amplify impact and accelerate delivery.

Appendix 1 – Interviewees

Registered Social Landlords

- Fraser Kelly, Carole Yallop - Waverley Housing
- Caroline Purcell, Mike Wagner, Sarah Mackie - Scottish Borders Housing Association
- Gary Alison, Stuart Mackay - Loreburn Housing Association
- Neil Wilson-Prior - Eildon Housing Association
- Lorna McCubbin, April Devlin – DGHP/Waverley Housing
- Tim Bailey, Berwickshire Housing Association

Wider Stakeholders

- Louise Cox – Scottish Borders Council
- Gillian Cameron – Supplier Development Programme
- Greg Steel – Borders College
- Douglas Dickson – Dumfries and Galloway College
- Elaine Ellis – Skills Development Scotland
- Jamie Little – Dumfries and Galloway Council
- Jane Grant – Borders College
- Rob Davidson, SOSE - Community Wealth Building
- Martin Valenti, Paul Wheelhouse – SOSE - Net Zero Directorate
- Aaron Hill - Scottish Federation of Housing Associations

Appendix 2 – Tenant survey

The following survey questions were issued by each of the six participant RSLs to their tenants through their resident engagement forums in July 2022. The survey closed on August 8 2022.

Survey questions

Background information

- So we can understand you better, you are a tenant with*: Insert name of RSL*
- What is your age? *Under 18, 18-30, 30-45, 45-60, 60+, prefer not to say.*
- What is your current employment status? *Employed full-time, Employed part-time, Self-employed, Not working at present, Retired, Prefer not to say.*
- Are you or any member of your household living with a disability? *Yes/No/Prefer not to say*

Housing information

- What type of property do you live in? *Flat/Terraced/Cottage/Semi-detached/Detached/Other.*
- How many rooms do you have in your home excluding bathrooms and the kitchen? *Insert number of rooms*
- What is the primary source of heating in your home? *GCH, electric heating, solid fuel, other – please state etc.*

What matters to you

- On a scale of 1 – 5 how important are the following matters to you:
  a. The cost of heating my home.
  b. The warmth and comfort of my home.
  c. The impact heating and running my home has upon the environment.
  d. The way that improvements to my home benefit the local area such as through job creation.
  e. Access to local public health services.
  f. Access to local public transport networks.
  g. Opportunities to come together with other members of the local community.

Knowledge around Heat systems

- Different ways of heating your home have different potential impacts upon the energy efficiency and comfort of your home as well as the local economy and the environment. With this in mind, do you agree with the following statements: *Strongly agree, agree, neither agree nor disagree, disagree, strongly disagree*
  a. I want the money I spend on heating my home to support the local community such as through providing heating and energy to public buildings like schools and community halls.
  b. I want a say in how my area moves towards greener energy.
  c. I would like to understand how heating my home has an impact on my local environment (e.g air quality).
  d. I understand the changes that are needed in my local area to ensure the environment is protected at the same as making sure people live in warm, comfortable and affordable homes.

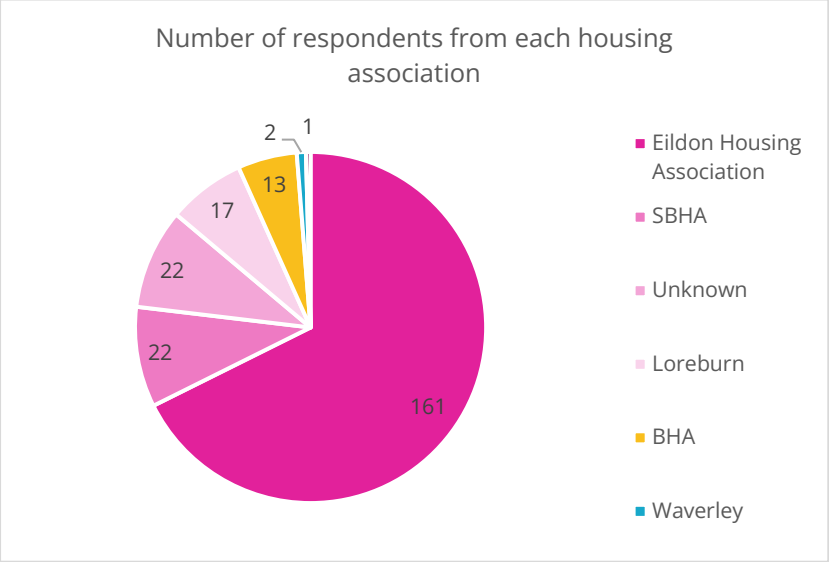
Behaviour changes

- Thinking about the relationship between your individual/household circumstances and the wider economic and environmental situation, how much do you agree with the following statements: *Strongly agree, agree, neither agree nor disagree, disagree, strongly disagree*
  a. I know what I could do differently to reduce the environmental impact of how I heat my home.
  b. I am willing and able to take steps to reduce the environmental impact of my home.

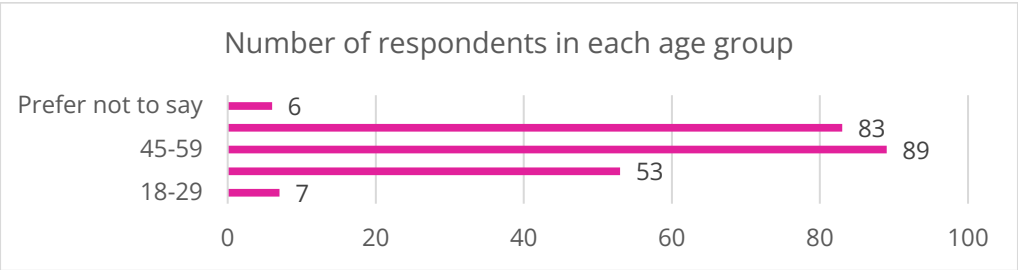
Resources – how do you want to be kept informed?

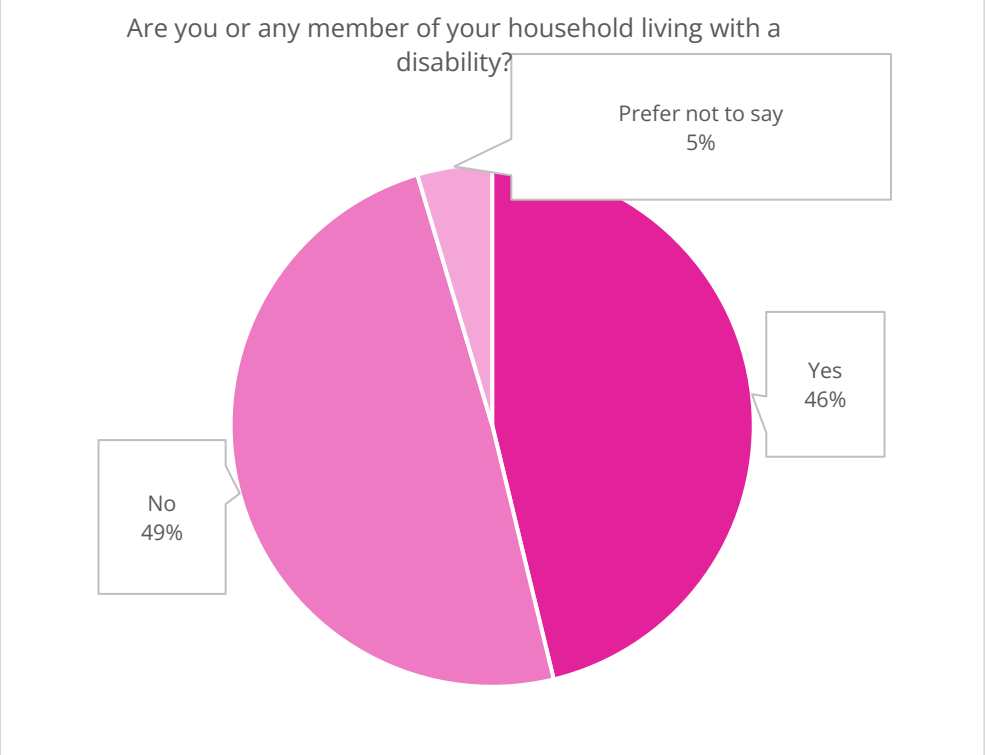
- Upgrades to the energy efficiency of homes can be disruptive but also have a significant impact on the affordability, comfort and carbon emissions of a property. With this in mind, what information do you need to learn more? *Select all that apply*
  a. Flyers explaining what's needed
  b. Events about energy efficiency
  c. A citizens' assembly on home heating for social housing tenants
  d. Online resources
  e. Conversations with experts
  f. Other – please list _____

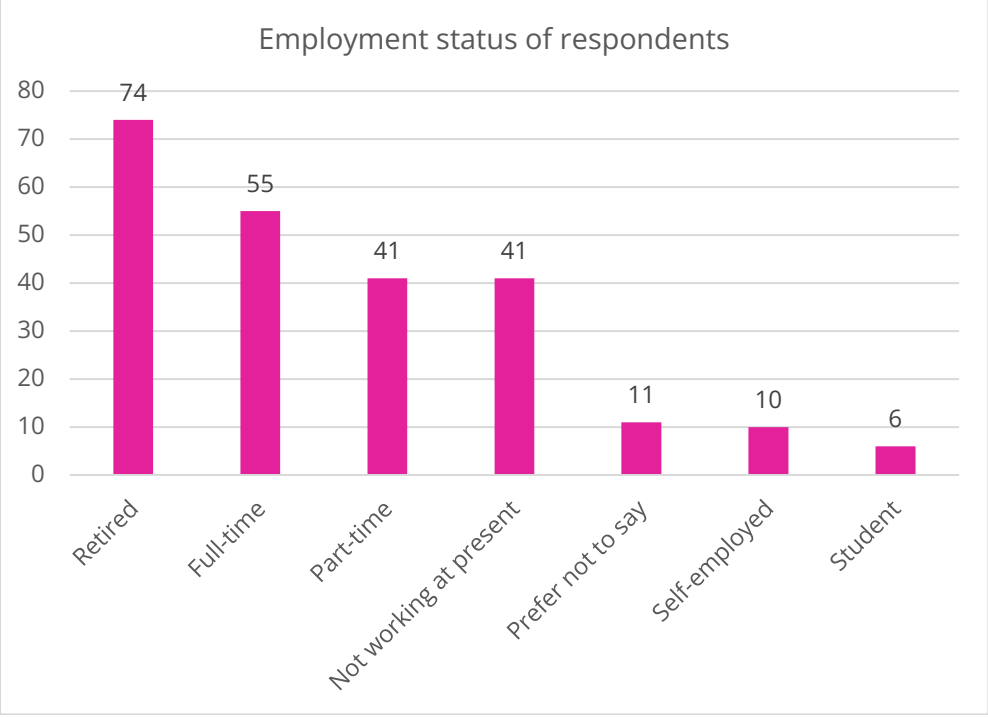
Survey responses and analysis



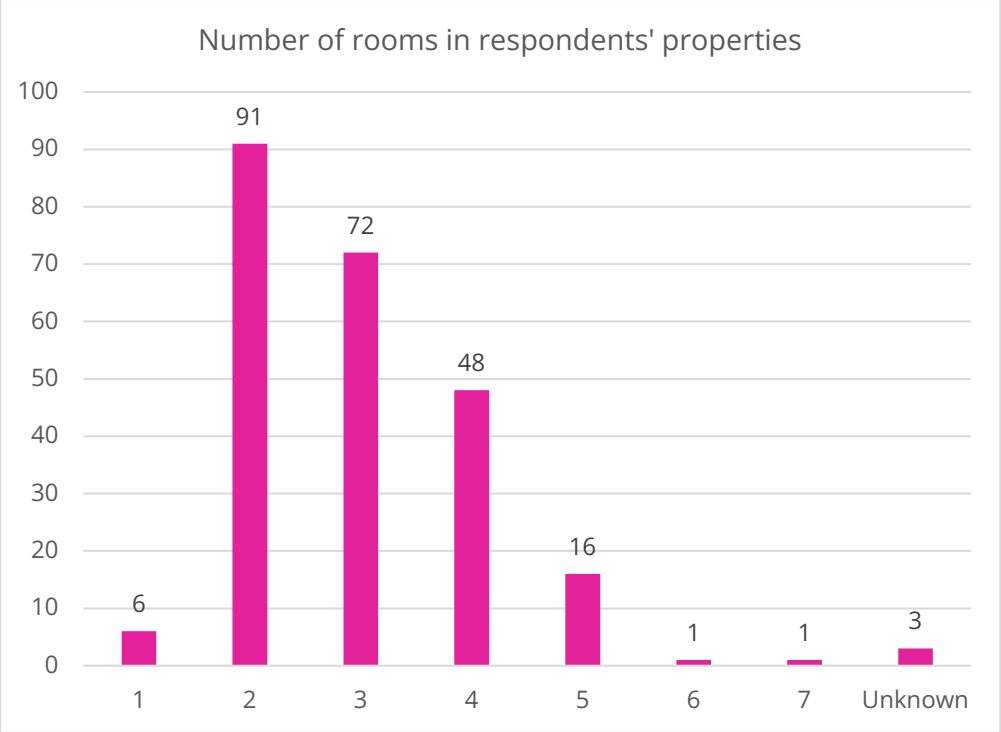
We collected responses from **238 tenants**. 161 (68%) are from Eildon Housing Association, 22 (9%) from SBHA, 17 (7%) from Loreburn, 13 (5%) from BHA. We had only 2 responses from Waverley and 1 from DGHP. 22 (9%) of responders did not specify the name of their housing association.



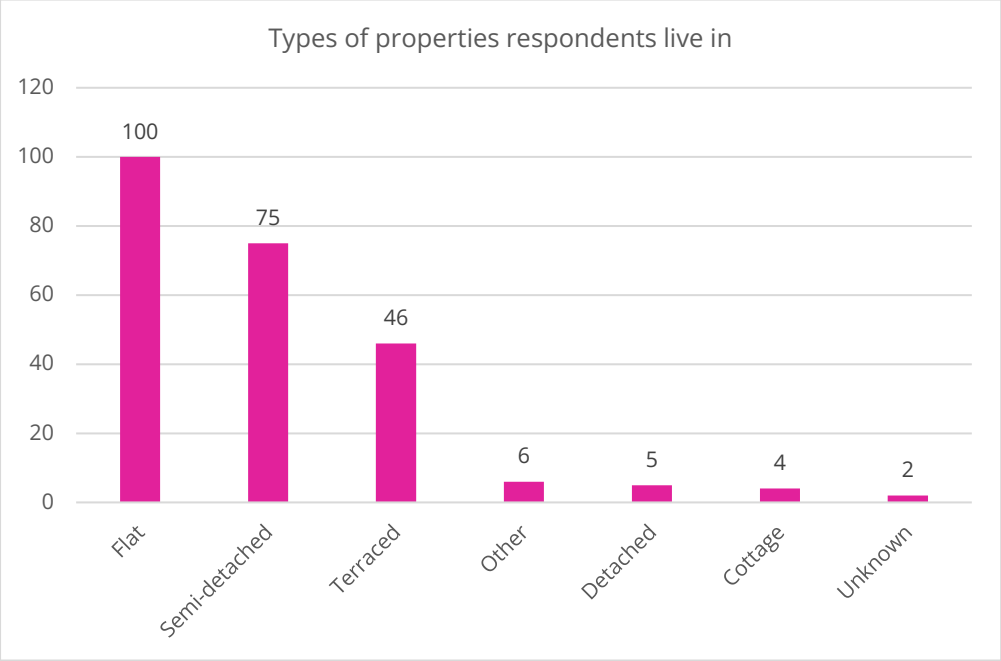


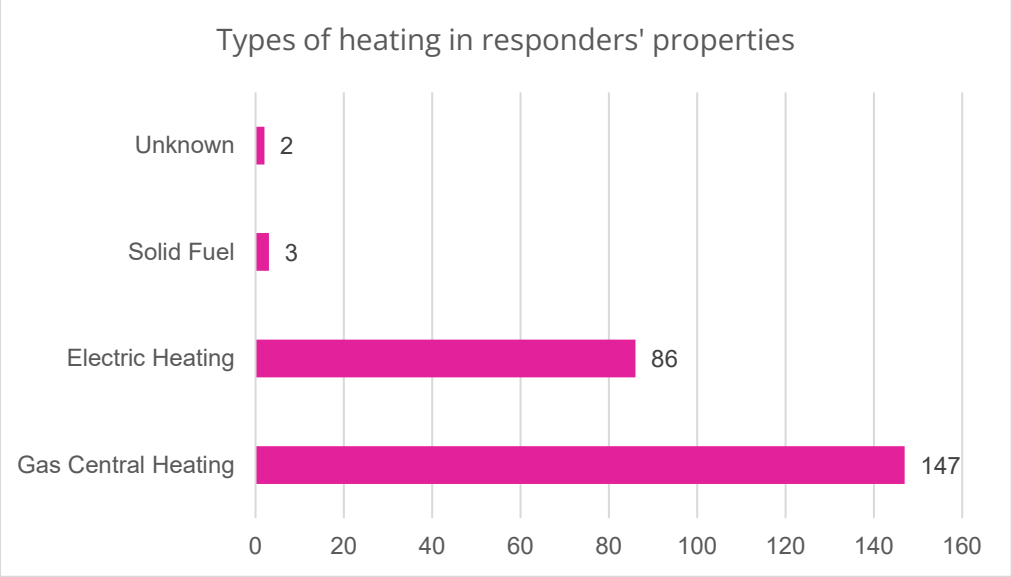


72% of the respondents are in the age of 45+, 35% 60+ and 74 (31%) are retired. 45% are in full time, part time or self-employment. 46% of respondents live with disability or with someone living with disability.

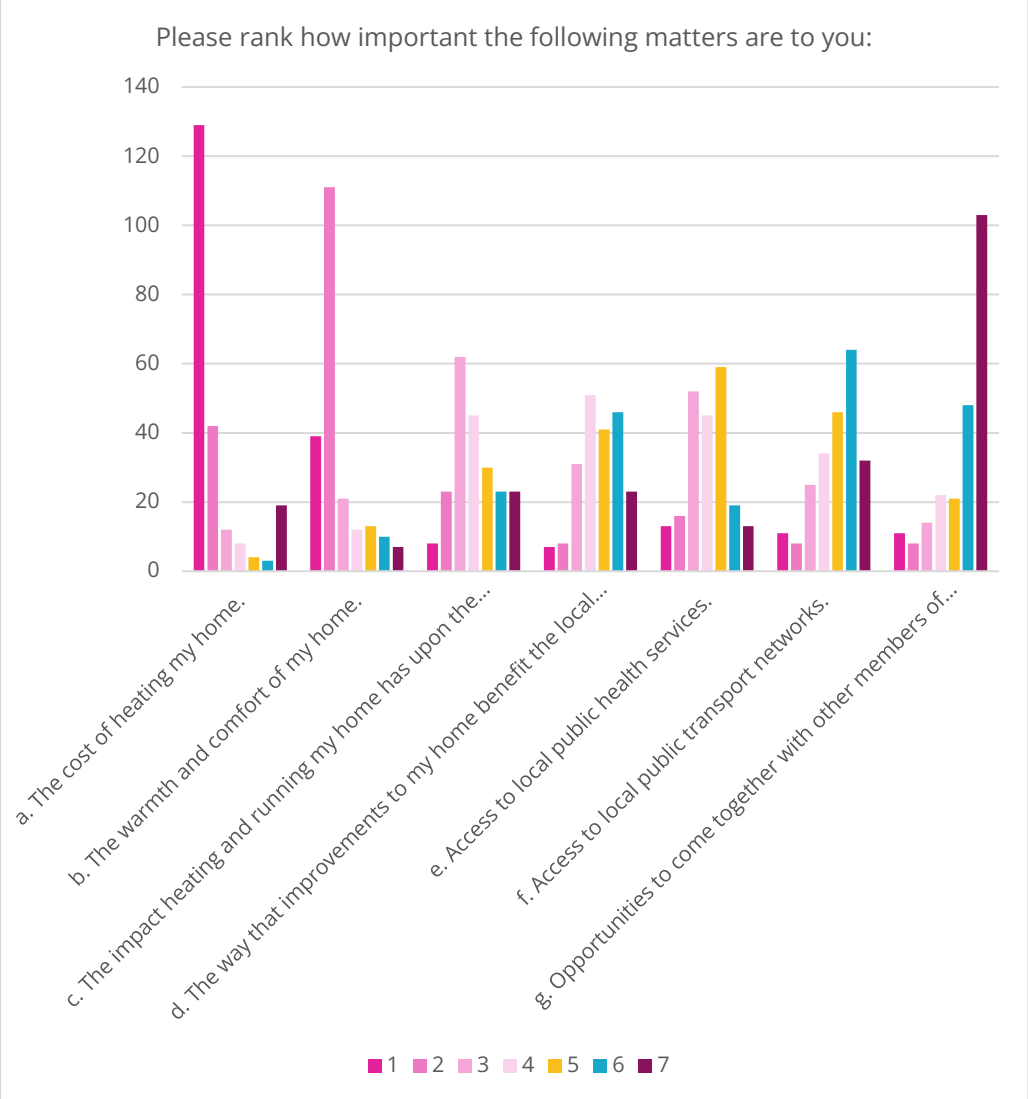


The median number of rooms in respondents' properties is three.



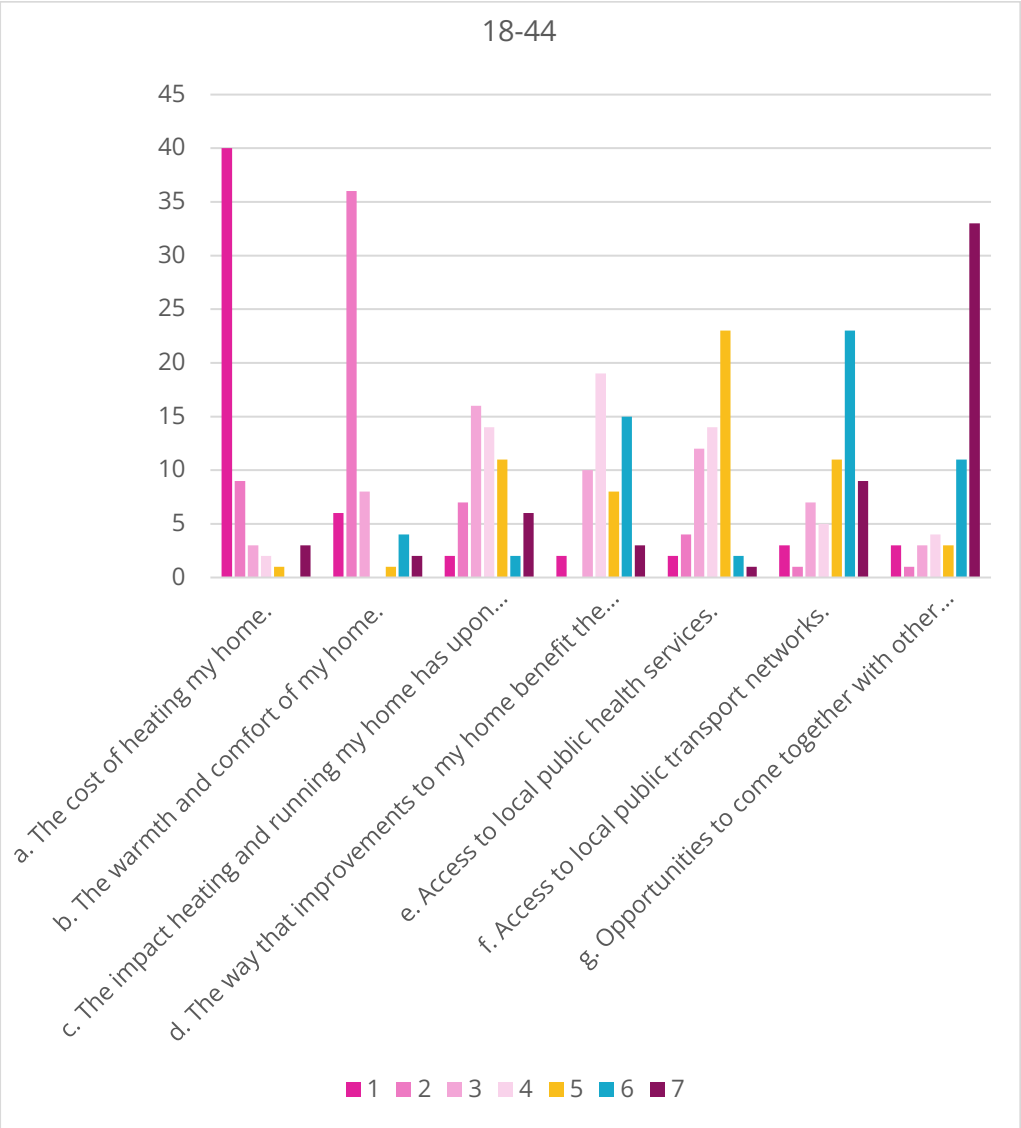


62% of the properties use gas central heating and 36% electric heating.



The survey shows very **divided attitudes** towards the **impact on environment**. 39% of respondents places it within the top three most important matters and 32% within the three least important ones.

Access to local public health services is a similar case. 34% give it a top three position and 38% put it in the bottom three.



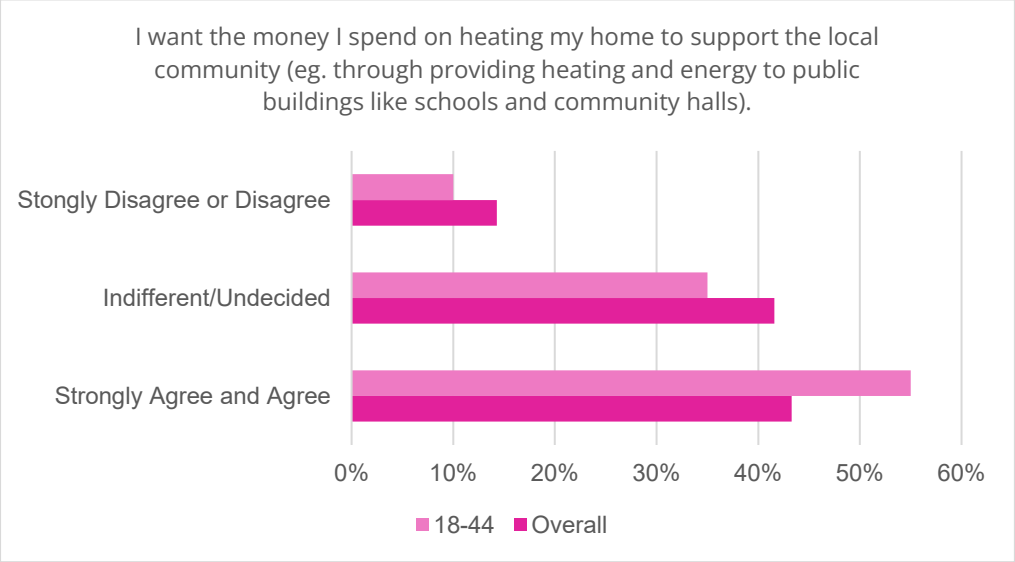
When it comes to the **younger group of respondents (18-44)**, **the cost of heating and their home's warmth and comfort** are even more important. 67% of respondents (+13%) rank the former as the single most important matter and 87% (+10%) place it within the top three matters. 83% (+11%) placed the home's warmth and comfort in top three.

When we **exclude the younger respondents**, 50% placed **cost of heating** as the top priority and 74% within the top three, which still makes it the most important matter. 68% placed the home's warmth and comfort in top three.

Concerns about environmental impact of their heating are almost unchanged for younger respondents (+3% in top three, same result in bottom three).

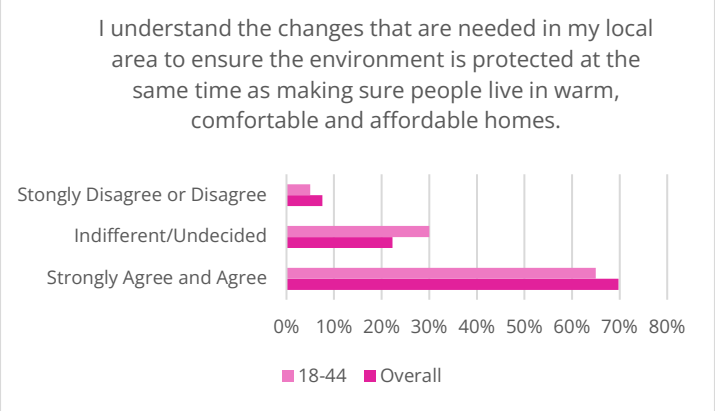
They also give slightly less importance to opportunities to come together (+6% in bottom three and **+12% for it as the least important matter**) and access to public transport **(+12% in bottom three**).

Degree of agreement to given statements



43% of respondents agree or strongly agree that they want the money they spend on heating to support the local community, 42% are indifferent and 14% disagree or strongly agree. When we take into account only people aged 18-44, **55% (+12%) agree or strongly agree with the statement**, with 10% disagreeing and 5% less indifferent at 37% overall.

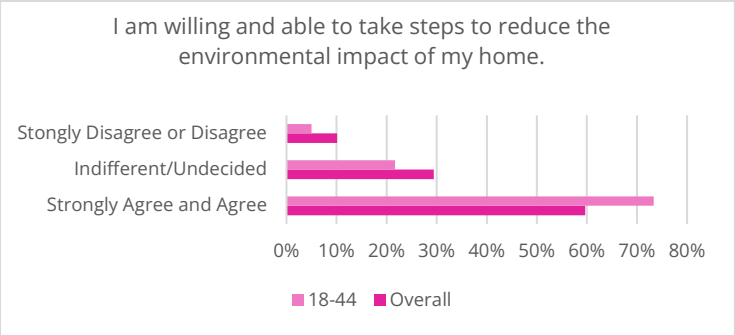
Most of the respondents at least agree that they want a say in how they area moves towards greener energy (62%) and would like to understand the impact of their heating on the environment (60%).



70% claim that they understand the changes that are needed to be both environmentally friendly and ensure comfort of community members. Only 8% do not think they understand it. The younger group is only slightly less confident with 65% (-5%) claiming they understand what needs to be done.

All these questions were met with rather a significant number of indifferent or undecided people (respectively 42%, 32%, 32% and 22% overall and 35%, 30%, 32% and 30% for younger group).

51% agree or strongly agree that they know what they could do differently to reduce their environmental impact. 37% neither agree nor disagree and 12% do not know what they could do. The younger group is a bit more confident in this matter, with 58% (+7%) agreeing and 8% (-4%) disagreeing.



60% are willing to take steps to reduce the environmental impact of their home. Also, 60% would like to learn more about the topic. Taken on its own, the **younger group's enthusiasm is bigger**, with 73% **(+13%)** and 65% (+5%) respectively.

Resources needed (multiple answers permitted)

We asked the respondents what resources they need to be informed and make decisions.

51% think they need flyers explaining what's needed to improve their home's energy efficiency and 46% think they need online resources. Events about energy efficiency, a citizens assembly and conversations with specialists each were pointed by **around a quarter of respondents**.

The biggest number of other responses were related to the need **to change the inefficient forms of heating**, which are unaffordable (7 responses, 3%) and all of those were presented by residents of **Eildon Housing Association.**

Results **by RSL**

The only RSL for which it would be relevant to do a separate analysis is Eildon Housing Association, with 161 (68%) of responders from this RSL. So far, however, it seems that the overall results are representative for Eildon.

52% place the cost of heating as the most important priority, with insignificant difference of -2% compared to overall result. 75% (also -2%) place it within the top three most important matters.

Similarly, 41% (-2%) place opportunity to come together with other members of community as the least important and 70% (-2%) rate it in bottom three priorities.

11% of respondents from Eildon disagree that they are willing and able to take steps to reduce the environmental impact of their home. This compares to 10% same responses overall.

Therefore, overall results are representative for Eildon Housing Association on its own.

Appendix 3 – Economic analysis – prepared by IPPR

1 – Methodology

1.1 Technologies

In this modelling we explore the investment required, job creation potential, and GVA effect of deploying the following technologies in line with net-zero targets. These technologies include:

- Energy efficiency products (e.g. loft and wall insulation)
- Energy saving controls (e.g. temperature controls)
- Low-carbon heating (heat pumps)
- Low-carbon district heating (heat networks)

Note that the investment figures described below describe investment across many different types of heat pumps and combinations of heat pumps with other technologies (i.e. hybrid heat pumps). For simplicity in our modelling, we group all of these figures together under the category of 'low-carbon heating (heat pumps)'. However, certain types of heat pumps or hybrid heat pumps may be more suitable than others in the South of Scotland. While the model does not specify the composition of different heat pump combinations in this region, the aggregation of overall investment in heat pumps reduces the likelihood of significant variation between regions.

1.2 Investment

The model uses investment modelling undertaken by Element Energy for the Climate Change Committee's Sixth Carbon Budget for Scotland (CCC 2020) which looks at the investment cost of retrofitting Scotland's homes using the technologies described above to meet net zero targets. This modelling takes a 'fabric first' approach and therefore frontloads investment into energy efficiency products in the 2030s – this is why there is little to no change in job creation in this sector between 2032 and 2045.

Total investment figures were calculated between 2021 and 2032, and 2021 and 2045 for both Scotland as a whole and just for social housing in Scotland. The investment figures were used in conjunction with the input/output tables mentioned below.

1.3 Categorising jobs by technology and sector

Every sector of the economy (by "sector", we mean the Standard Industrial Classification ("SIC") code categories which divide up different parts of the economy) employs a different number of people and, correspondingly, when calculating indirect employment using multipliers from an input/output table, every sector of the economy is associated with a different employment multiplier.
Therefore, in preparation for using input/output tables to calculate direct and indirect employment, it was important to understand a) which technologies were being deployed and b) the composition of employment for each of these technologies across different sectors of the economy. The sources and caveats of this approach are noted in 3.3 below.

The purpose of this step was to ensure that each technology being deployed in this modelling had an associated breakdown of employment by SIC code sector and that this breakdown by sector broadly matched the categories provided by input/output tables by the Scottish Government. This second step allowed us to find equivalent multipliers in these input/output tables for each sector relevant to our chosen technologies and develop an overall multiplier for each technology, weighted appropriately according to their sectoral composition.

1.4 Input/Output tables

This modelling used input/output tables available from Scottish Government publications. The latest tables are from 2018 meaning that there may have since been changes in employment and GVA intensity by sector (i.e. the number of people employed or the GVA created per £ million of investment).

Furthermore, for the purposes of this modelling we assume that all businesses across these sectors in Scotland are equally labour intensive, while recognising the likelihood of some regional variability.

To calculate total employment (direct and indirect jobs) and total GVA (direct and indirect GVA effect) for Scotland first, we developed weighted employment effect and GVA effect multipliers according to the methodology stated above in 1.3. We then multiplied total investment over the two time periods of interest (2021-2032 and 2032-2045) for each technology of interest by their relevant employment effect and GVA effect multipliers. To separate direct and indirect employment and GVA we then divided these figures by their employment and GVA multipliers respectively (NB when using the terms 'employment effect multipliers' and 'employment multipliers' we are referring to different multipliers, and the same applies for GVA).

We then repeated this process to calculate employment and GVA in social housing in Scotland.

To specify investment, employment and GVA for both total home retrofitting and social home retrofitting in South Scotland, we divided the total investment by the proportion of a) homes and b) social homes in South Scotland compared to the national total using housing statistics published by the Scottish Government (2022).

1.5 Distributional adjustments

To estimate job creation and GVA more accurately in all homes and social homes in the South of Scotland, we made a number of adjustments in the modelling to reflect the fact that different regions have different existing levels of energy efficiency and population density, and hence have different retrofitting requirements. Below, we set out the three key adjustments for this modelling

1.5.1 Distributing energy efficiency jobs among homes below an EPC of C

The Scottish Government has previously set a target of most homes reaching an EPC of at least C by 2030 (CCC 2021), which some homes have already met. We therefore subtract the number of homes in each local authority that are already at or above an EPC of C or B from both total housing stock and within the social housing stock in each local authority. We note that social housing has a higher EPC target of reaching B by 2032 but it was not possible to separate EPC data to subtract social housing that had an EPC of B only (because social homes with an EPC of C will also need to be upgraded). However, the variation in the modelling is minimal as this adjustment is only intended to provide an estimate for how the total number of energy efficiency measures needed would be distributed by local authority.

1.5.2 Distributing energy efficiency jobs based on fuel poverty in each region

We make our second adjustment based on the number of fuel poor homes in each local authority. While the modelling does not indicate which specific measures each fuel poor home would need, the adjustment allows us to demonstrate that fuel poor homes are likely to need to receive a greater number of upgrades and, accordingly, are likely to see a slight increase in employment needed in those areas. The adjustment is done based on the percentage difference between fuel poverty within a local authority compared to the average fuel poverty across all regions.

1.5.3 Distributing low-carbon heating jobs based on population density in each region

Finally, we adjust the distribution of low-carbon heating technologies by factoring in population density. While we do not provide a street-by-street analysis of which technologies are best suited to which buildings, in more densely populated areas and regions, it is more likely that heat networks will be more suitable than heat pumps. Consequently, we establish an initial ratio of heat pumps to heat networks for all homes and all social homes and then adjust these ratios based on how population density across each region differs from the average population density, with denser areas receiving more heat networks and vice versa. We then multiply the number of measures deployed by a common jobs per measure estimate to adjust employment in low-carbon heating technologies across each region.

2. The economic opportunity for Scotland

Table 2.1: Investment into energy efficiency and low-carbon heating can yield significant economic benefits
Summary of economic benefits across different geographies and housing types.

Year by	Geography	Investment (£m)	Direct GVA effect (£m)	Indirect GVA effect (£m)	Total GVA effect (£m)	Direct jobs created	Indirect jobs created	Total jobs created
2032	Social homes in South Scotland	£75	£33	£18	£51	581	343	924
	All homes in South Scotland	£308	£135	£76	£211	2,687	1,549	4,236
	Social homes in Scotland	£1,203	£526	£297	£823	9,462	5,612	15,103
	All homes in Scotland	£5,874	£2,574	£1,447	£4,021	44,902	25,890	70,792
2045	Social homes in South Scotland	£168	£78	£45	£122	1,383	813	2,196
	All homes in South Scotland	£779	£340	£193	£533	6,690	3,832	10,522
	Social homes in Scotland	£2,889	£1,3376	£765	£2,102	23,220	13,647	36,866
	All homes in Scotland	£15008	£6,556	£3,716	£10,271	110,523	63,309	173,832

2.1 The economic opportunity for the South of Scotland

As we show in figures 3.1 and 3.2 below, retrofitting homes in the South of Scotland could be a substantial job creator within the region. By 2032, retrofitting could sustain up to 2,687 direct jobs within Dumfries and Galloway and the Scottish Borders by 2032, of which 581 could come from retrofitting social housing. By 2045, the industry could sustain up to 6,690 direct jobs within Dumfries and Galloway and the Scottish Borders, of which 1,383 could come from social housing. In terms of broader economic impact too, by 2032, in the South of Scotland, retrofitting could generate £135 million in GVA, of which £33 million could come from social housing. By 2045, retrofitting could generate £340 million in direct GVA effect, of which £78 million could come from social housing.

Figure 3.1 Direct retrofitting jobs can be an important employer in the South of Scotland

Retrofitting jobs created by 2032 by local authority, adjusted by fuel poverty and population density

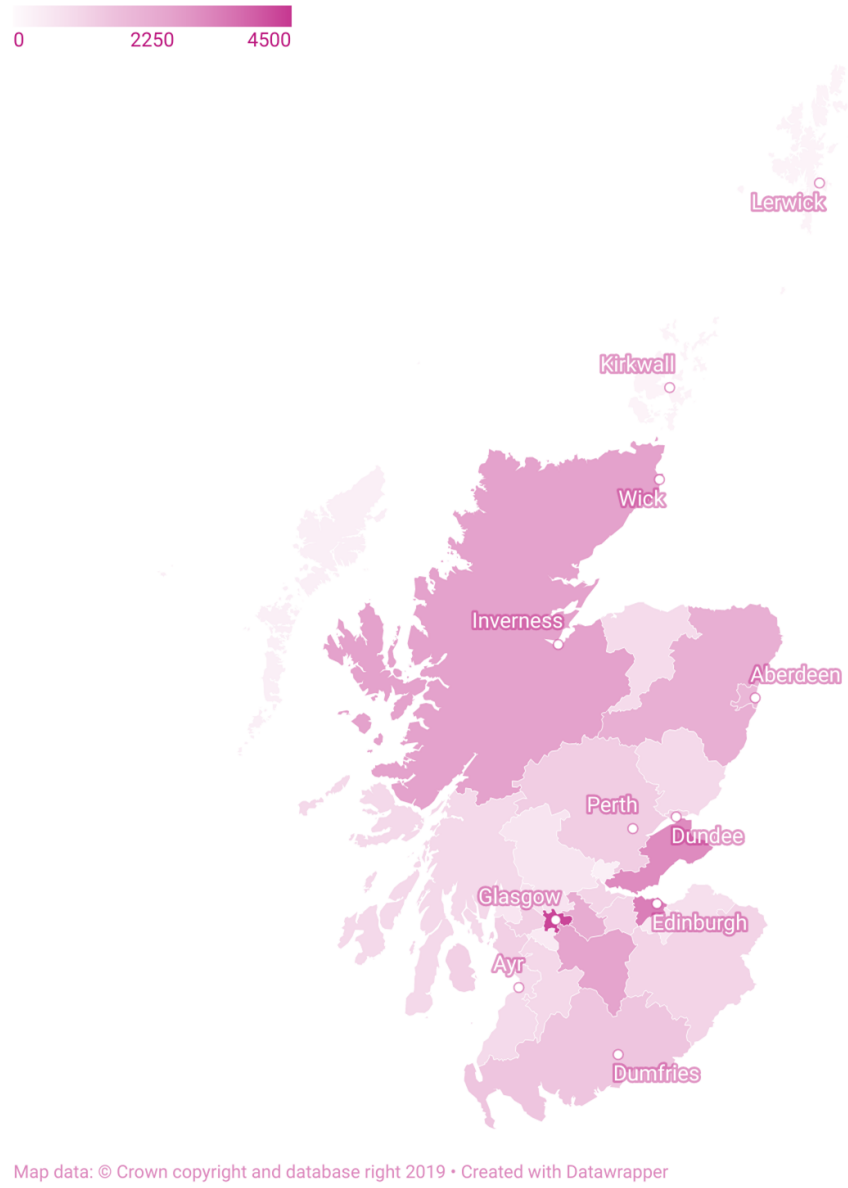
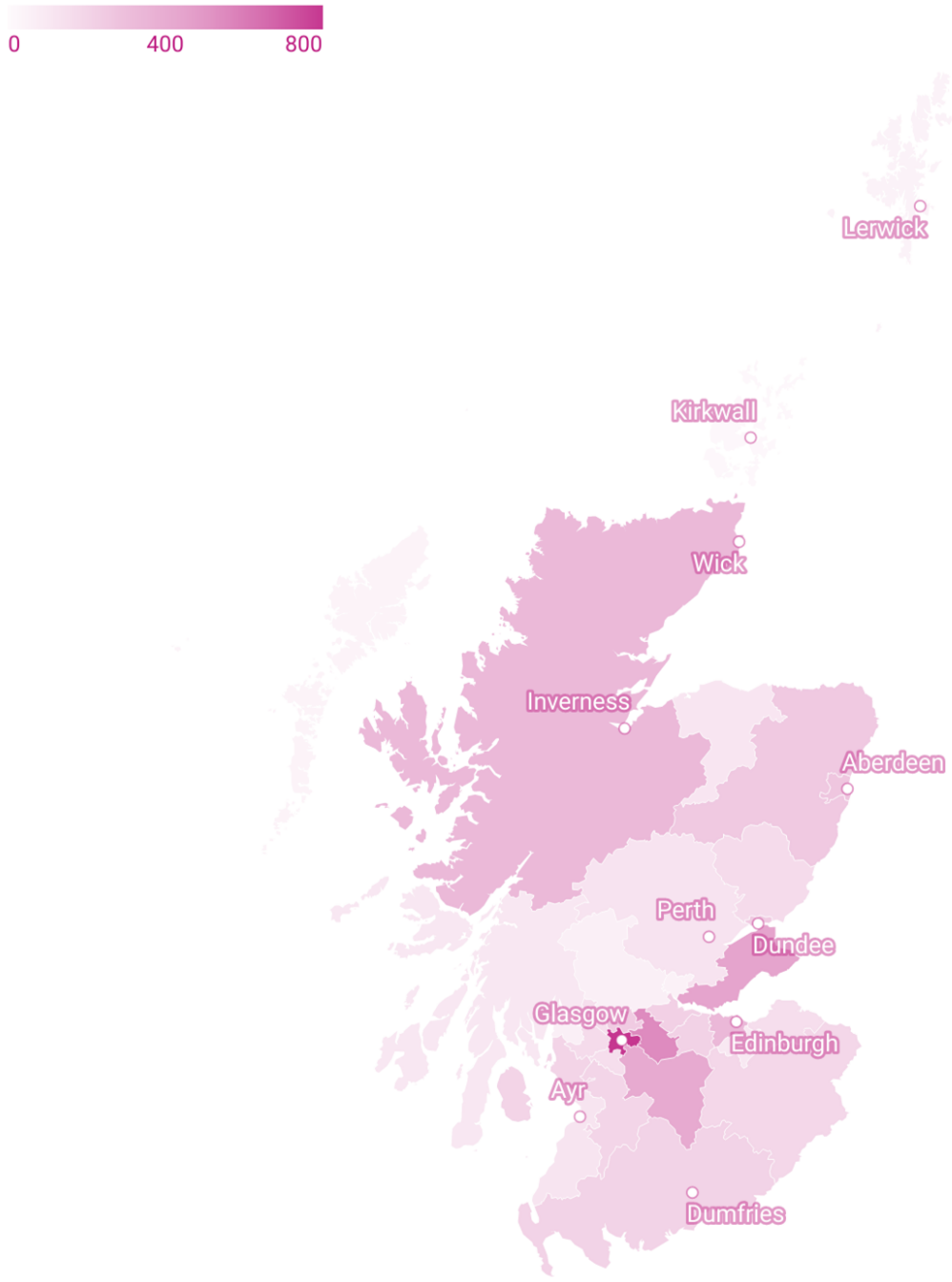


Figure 3.2 Direct jobs in retrofitting social homes can also be an important employer in the South of Scotland

Retrofitting jobs in social housing created by 2032 by local authority, adjusted by fuel poverty and population density



Map data: © Crown copyright and database right 2019 • Created with Datawrapper

In addition, while we do not include this in our modelling as neither the UK nor Scottish Governments have specific rooftop solar targets, Solar Energy Scotland has previously called on the Scottish Government to deploy 6GW of solar power which could create up to 3,000 jobs across Scotland (Solar Energy Scotland 2021)[33]. Importantly, according to Solar Energy Scotland, both Dumfries and Galloway and Scottish Borders are two of the regions with the largest solar PV deployment, and hence, potential employment.

[33] Scotland's Fair Share: Solar's role in achieving net -zero in Scotland, Solar Energy UK, 2021 Link.

Importantly, this analysis does not look at the distribution of indirect jobs by region as 'indirect' here refers to jobs that are created in retrofitting supply chains – such as the manufacturing of insulating materials or heat pumps. Jobs in the supply chain tend to be more geographically spread out and difficult to track. However, while we do not attempt to quantify how important supply chain jobs may be to local economies, as Table 2.1 shows, the number of indirect retrofitting jobs that could be created and the indirect GVA that could be generated is substantial for the South of Scotland. In addition, there is good evidence to suggest that investment in local economies can create a 'crowding in' effect where businesses establish supply chains collocated to areas of high demand and investment activity (IPPR 2018)[34].

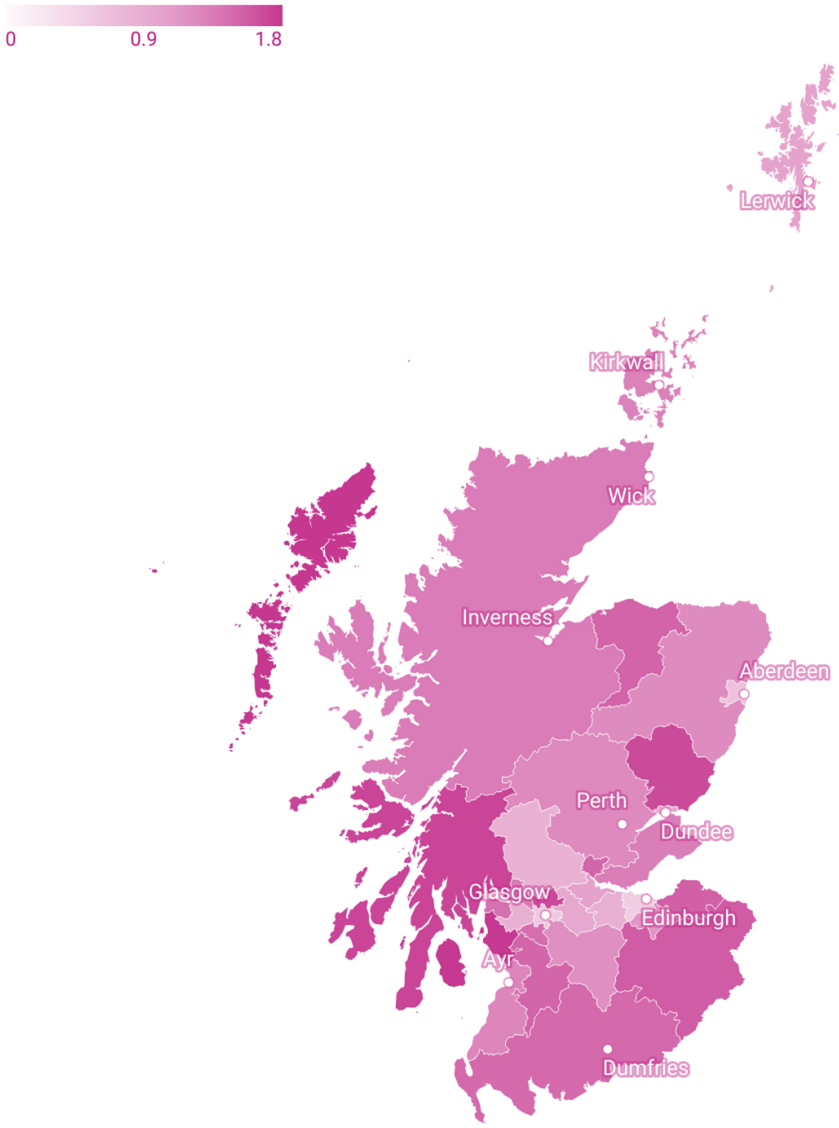
2.2 Jobs in retrofitting could have a substantial impact on local economies in South Scotland

Not only will retrofitting jobs benefit the South of Scotland in absolute terms, but these jobs can also become a key source of employment *within* local economies. We demonstrate this impact using Location Quotient (LQ) analysis, which shows the ratio between the importance an industry has within a region compared to its importance nationally. This helps to demonstrate the scale of the economic boost which retrofitting jobs could provide.

Looking at Dumfries and Galloway and Scottish Borders specifically, creating 1,534 and 1,153 direct jobs respectively (2,687 in total as shown above) in retrofitting by 2032 would represent around 2.7 and 2.8 per cent of the workforce per cent of the workforce in these regions in 2020 (BRES 2022)[35]. However, in Scotland as a whole, creating around 45,000 retrofitting jobs by 2032 would represent around 1.8 per cent of total employment in 2020, meaning employment in retrofitting could have a more significant employment impact in South Scotland than the national average with an LQ score of 1.5 and 1.6 for Dumfries and Galloway and Scottish Border respectively[36].

Figure 3.3 Direct jobs in retrofitting can become an important industry within both South of Scotland regions.
Location Quotient analysis for direct jobs created in Scotland by 2032, by local authority, adjusted for fuel poverty.

[34] Prosperity and Justice – A plan for the new economy – The final report of the IPPR Commission on Economic Justice, IPPR, 2018 Link.
[35] This analysis does not make assumptions about population growth or employment rates by 2030 or 2050 and the comparison is intended to illustrate how retrofitting could be a key source of future employment in local economies. It also does not make assumptions about other employment growth initiatives in these local economies.
[36] This analysis does not assume all jobs created within retrofitting will be new jobs to the economy and more simply highlights how important the retrofitting sector could become in each local economy



Map data: © Crown copyright and database right 2019 • Created with Datawrapper

SIC code breakdown	Low-carbon heating (heat pumps)	Energy efficiency products	Energy saving controls	Low carbon district heat
Repair & maintenance	-	7%	8%	-
Electricity	-	-	15%	50%
Construction	92%	85%	50%	38%
Information services	-	-	3%	-
Architectural services etc	8%	8%	18%	12%
Other professional services	0%	0%	6%	

Sources: IPPR analysis of ONS 2022[37], Scottish Government 2021[38] and Johns and Longlands 2020[39]

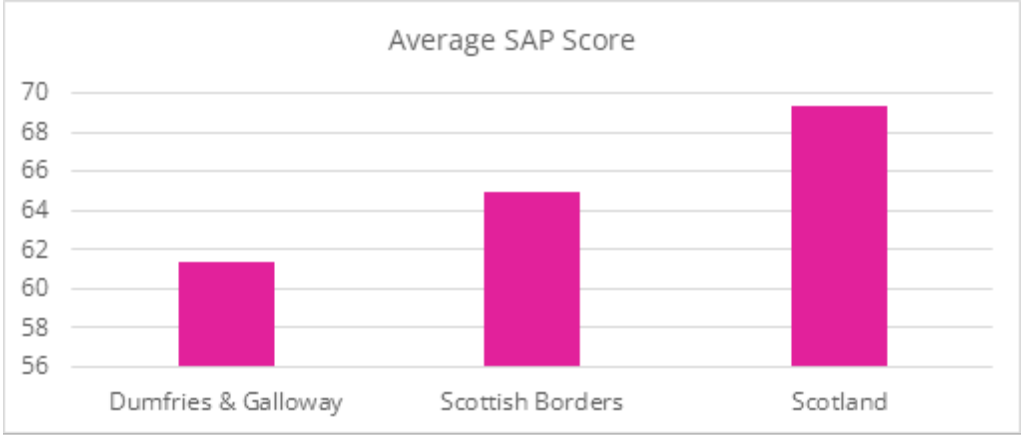
NB1: All jobs in manufacturing shown by ONS are ignored as we consider these to be 'indirect jobs' within the supply chain. We therefore remove them from calculations here to avoid double counting when calculating direct and indirect job creation
NB2: Job estimates by ONS do not match perfectly with SIC code categories for Scotland multipliers. For simplicity, jobs categorised as "professional, scientific and technical activities" by ONS are assumed to fall under "architectural services" (e.g. a retrofit co-ordinator) and those categorised as "Information and communication" are assumed to fall under "information services" (e.g. grid management)
NB3: By "low-carbon heating" we include different kinds of heat pumps including ground source and hybrid combinations

[37] Low carbon and renewable energy economy estimates, Office for National Statistics 2020 Link.
[38] Supply, Use and Input-Output Tables, Scottish Government, 2021 Link.
[39] Northern Powerhomes: A green recovery plan to decarbonise homes in the North, IPPR North, November 17, 2020 Read.

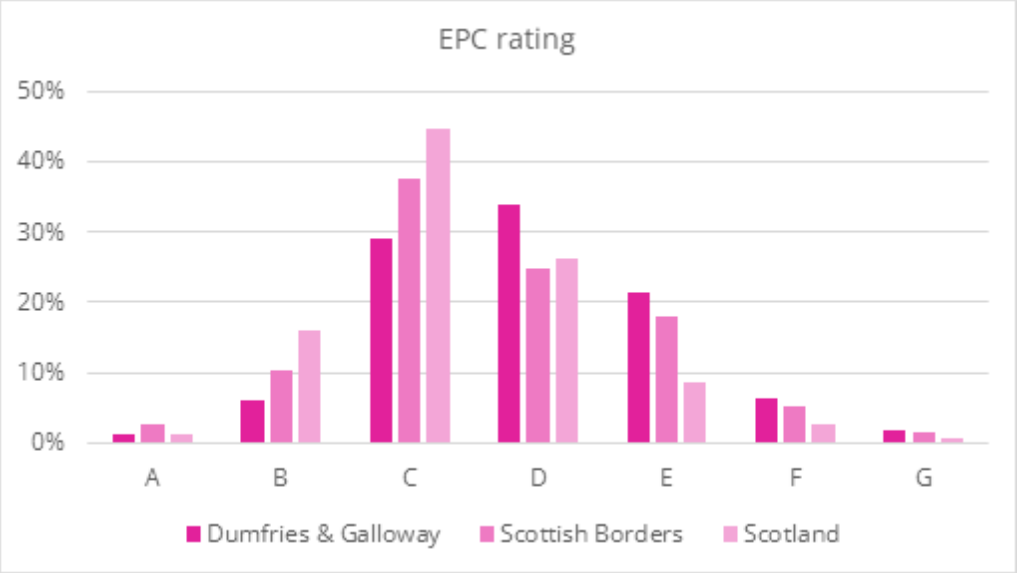
Appendix 4 – Residential heat data

Domestic Energy Performance

According to the Domestic Energy Performance Certificates (EPC) Dataset Q1 2022[1], properties in Dumfries & Galloway on average scored a Standard Assessment Procedure (SAP)[2] score of 61.3, while Scottish Borders records an average of 64.9 both of which are equivalent to an EPC 'D' rating, however this is below the Scottish average of 69.3 (an EPC 'C' rating).



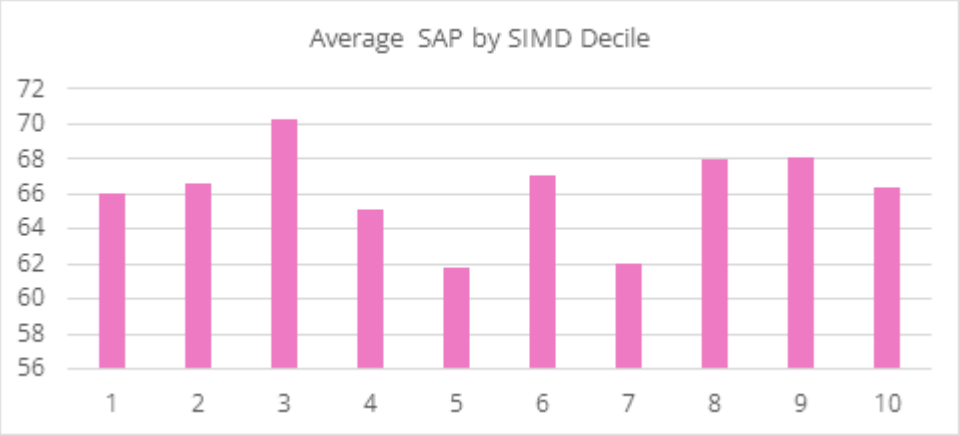
Looking at the distribution of domestic Energy Performance Certificates by band rating, we can see that South of Scotland has a larger share of E, F and G rated property than Scotland as a whole and Dumfries & Galloway has a larger share of D rated property. The South of Scotland has a smaller share of A to C rated properties compared to Scotland as a whole.



Exploring this at a deeper geographical scale, we can see average SAP and EPC ratings by ward with Hawick and Denholm recording the lowest SAP in the Scottish Borders at 61.7, giving an average EPC of 'D'. Dee and Glenkens in Dumfries & Galloway however has an average SAP of just 53.8, which is equal to an EPC band E. Leaderdale and Melrose in the Scottish Borders and North West Dumfries have the highest average SAP ratings, of 67.7 and 68.5 which are on the border of an EPC rating 'C'.

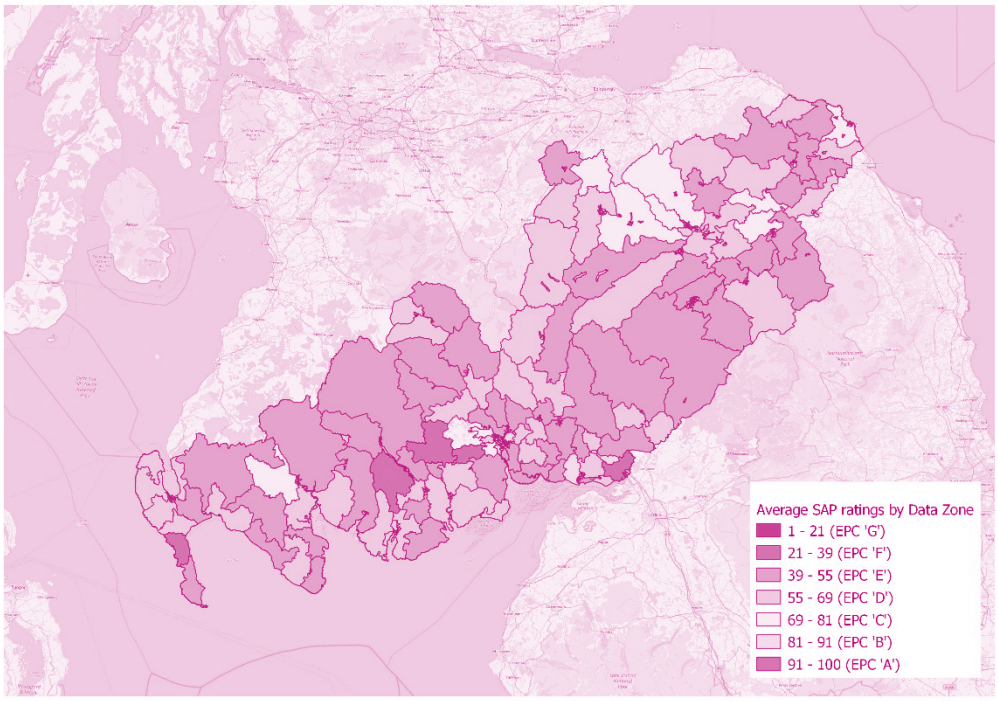
Exploring SAP scores by the Scottish Index of Multiple Deprivation ("SIMD") highlights that the most deprived areas do not necessarily have the lowest SAP scores, suggesting the prominence of social housing stock and historical housing decency programmes which have supported improvements in social housing stock have had an impact. The lowest SAP scores appear in the middle of the deprivation

ranks, with EPC ratings from domestic properties in the 50th and 70th deprivation percentile scoring the lowest SAP scores.

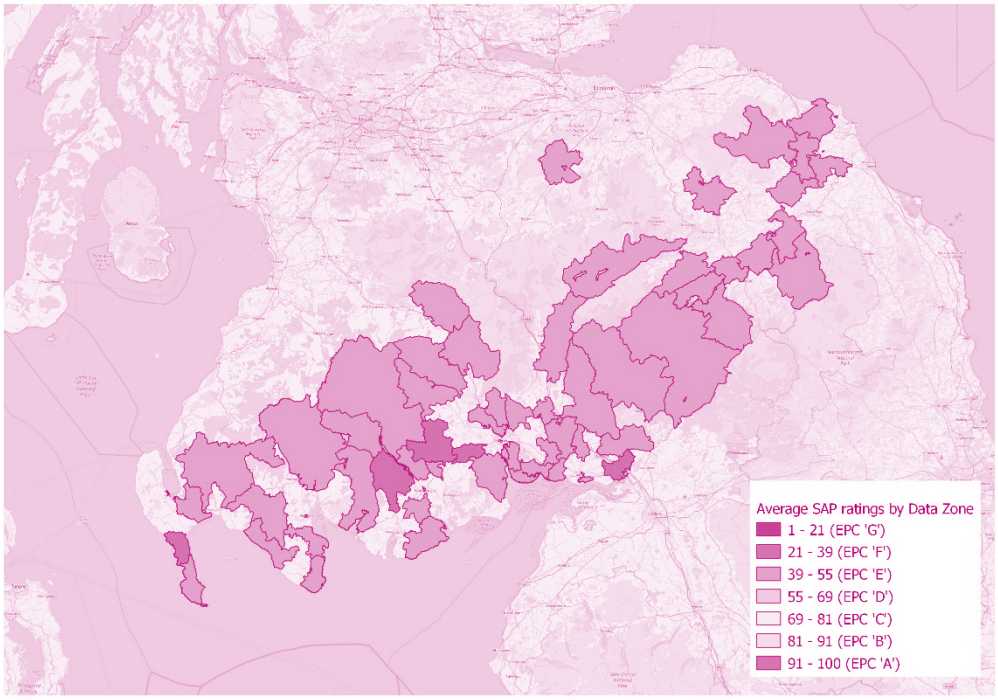


Exploring SAP data by data zones highlights how average SAP ratings vary across the South of Scotland, with the map below isolating the data zones that have an average SAP which falls into EPC rating D or below, which is below the national average.

Average SAP ratings by Data Zone

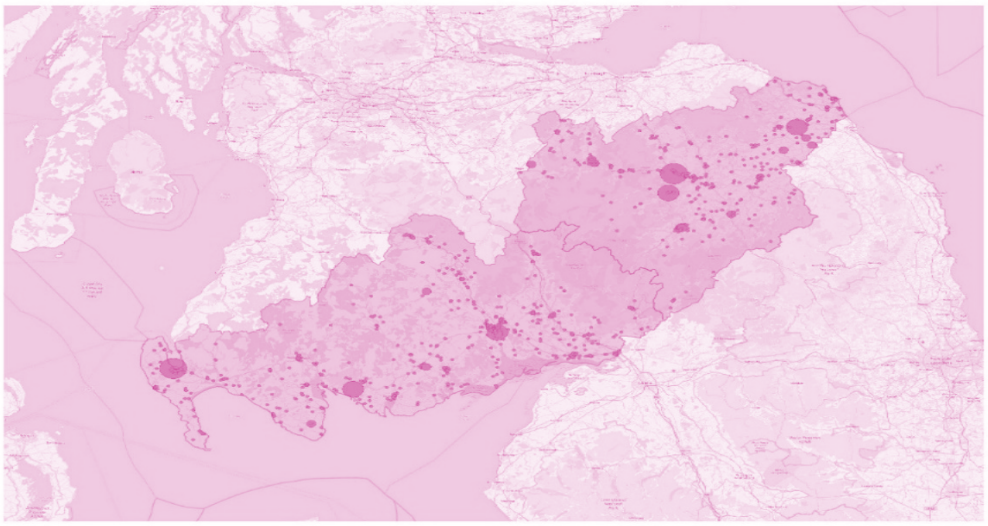


Average SAP ratings by Data Zone (E-G)

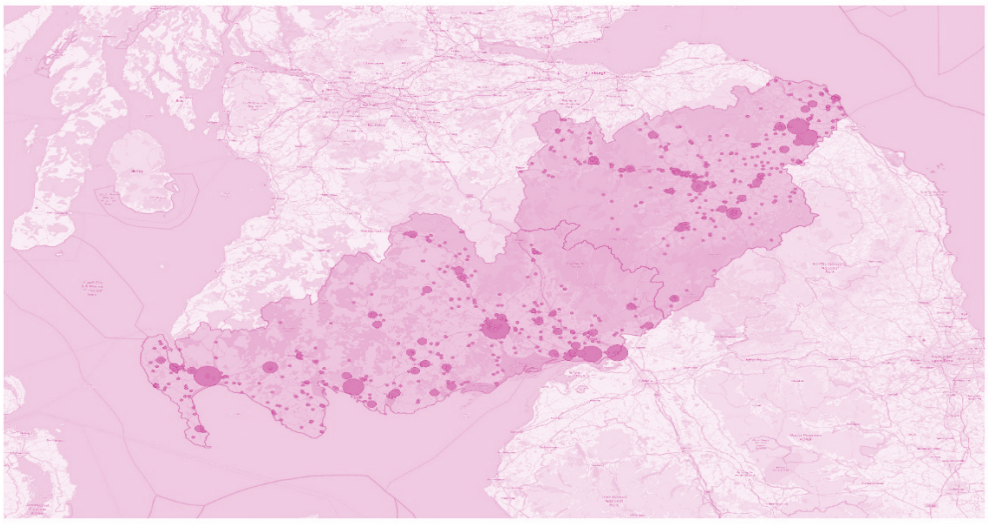


The following maps provide point data for instances of wall, roof and windows rated as poor within the EPC assessment.

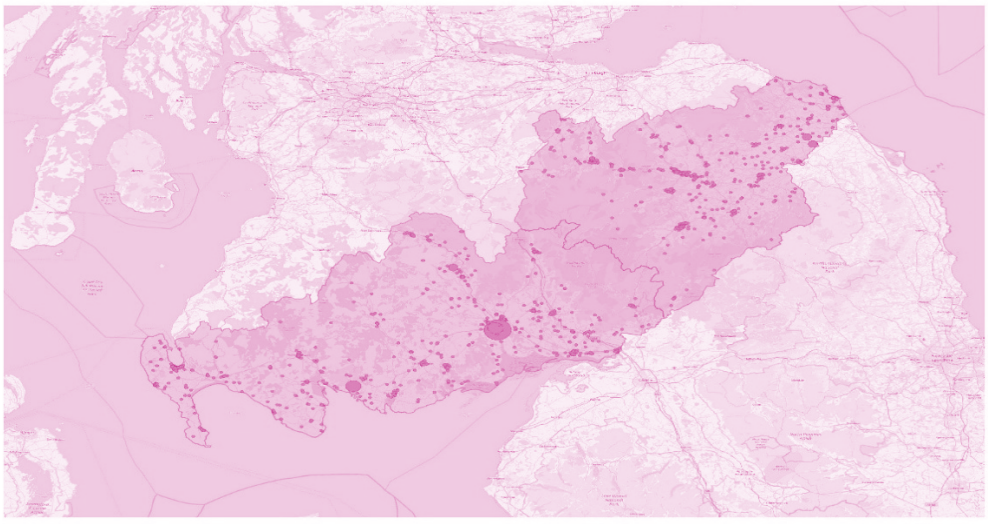
Poor wall insulation



Poor roof insulation



Poor window insultation



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