SCOTTISH BORDERS

LOCAL HEAT AND ENERGY EFFICIENCY STRATEGY 2024-2028

Scottish Borders COUNCIL

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Foreword

FOREWORD

It is a great pleasure to introduce the first Local Heat & Energy Efficiency Strategy for the Scottish Borders, which outlines the long-term shared vision for improving energy efficiency and decarbonising heat in our buildings.

The national objective to achieve net zero emissions by 2045 is a key driver for this strategy, alongside Scotland's target to eliminate fuel poverty as far as possible by 2040.

This Local Heat & Energy Efficiency Strategy (LHEES) builds on the Climate Change Route Map and the Local Housing Strategy 2023-2028, outlining the approach to our buildings as part of the response to the climate emergency.

This LHEES recognises the specific issues within the Scottish Borders relating to rurality and our sparsely spread population, a challenging economic context, and an above average proportion of fuel poor households. To achieve climate targets and a just transition, everyone has a duty to adapt to and mitigate the effects of climate change by using cleaner energy and changing our behaviour to reduce heat and energy waste. Through the identification of opportunities for energy efficiency improvements and heat decarbonisation in buildings, this strategy will ensure we can enhance our resilience and mitigate further irreversible impacts on our environment.

Strong regional and local partnership working will be critical to the effective delivery of this LHEES in order to meet targets for the benefit of everyone. We need the business sector, communities, and individuals to come together to help shape and deliver activity which responds to the climate emergency. The next decade will be critical in our just transition to a sustainable Scottish Borders future, and I look forward to working with partners and communities to meet these targets and see our plans progress.

Councillor Jenny Linehan
Executive Member for Environment & Transport

1 Executive Summary

This is the Local Heat and Energy Efficiency Strategy (LHEES) for the Scottish Borders. The LHEES is a place-based and locally led strategy covering the following national aims:

- Improving the energy efficiency and decarbonising the heat supply of all buildings in the Scottish Borders
- Eliminating poor energy efficiency as a driver for fuel poverty.

This strategy will play a crucial role in helping the Council meet its 2045 net zero target and 2040 fuel poverty target. It defines the changes required to the Scottish Borders' buildings and infrastructure, including all domestic and non-domestic buildings, to achieve these targets. This strategy does not only cover the council-owned buildings but rather an area-wide approach relevant to all property owners and occupiers in the Scottish Borders. Therefore, it goes much further than the council's role in decarbonising its own estate as it outlines what action all owners and occupiers will need to take to deliver the LHEES. This covers a large proportion of the population who will need to be motivated and supported to take big steps to decarbonise their homes and places of work. To fully represent this broad participation, the council has engaged with multiple stakeholder groups and is holding an open public consultation to gather feedback before finalising the LHEES. Additional stakeholders will be identified and consulted as the Strategy and Delivery Plan matures and develops.

This LHEES has been prepared in line with the LHEES Guidance issued by the Scottish Government and utilises and builds on the LHEES Methodology issued by Zero Waste Scotland. Our approach for preparing this LHEES covers:

- Establishing the necessary changes required for each segment of the Scottish Borders' building stock to increase its efficiency and decarbonise its heat.
- Identifying strategic zones for heat decarbonisation and establishing the primary steps to decrease emissions from buildings in each of these zones.
- Identifying delivery areas for building-level energy efficiency measures, including communal heating options, and zones for heat networks.

In developing this LHEES, the council aligned the national targets set out in legislation with the local priorities of the people in the Scottish Borders. This included reflecting regional needs and local building characteristics and performance, gathered via stakeholder engagement or work carried out to inform existing local policies and plans. The result is an overall 'LHEES Vision' to address fuel poverty, improve energy efficiency of buildings and decarbonise their heat supply as part of a just transition which delivers on community wealth building. This means that the outcomes of the LHEES will be delivered in a way which ties together multiple priorities, as visualised in the following figure.

The LHEES Vision

Increase the energy efficiency of our homes and buildings, offer affordable warmth via zero emission heat, and deliver this as a just transition which tackles fuel poverty and builds community wealth.

The LHEES Priorities

Cost of heating

- **Tackle poor energy efficiency as a driver of fuel poverty** by focusing on areas with high fuel poverty, leveraging EES:ABS and social landlord commitments and regulations.
- Drive energy efficiency to **make warmth affordable for all**.

Heat Decarbonisation

- Support the **electrification of heat, communal heat and renewable installation across buildings** in the region.
- Support the development of zero emission **heat networks**.
- Target "low-regrets" **heating opportunities in off-gas areas**.

Just Transition

- Support the local economy and **improve the regional skills, employment and supply chain**.
- Utilise procurement, delivery models, planning, regulation, and other powers to **make this transition work for the people**.

The LHEES Strategy is a flexible document and will thus develop and mature through the inclusion of additional analysis, plans and actions following Scottish Borders' decarbonisation journey. The strategy will be reviewed and updated on a five-year basis, and the accompanying delivery plan will dynamically evolve as projects develop and are incorporated into the pipeline.

The LHEES addresses the improvement and development of three main types of built assets: **domestic buildings, non-domestic buildings, and heat networks.**

Domestic: Most properties in the Scottish Borders are domestic (88.4%). The majority (81%) of domestic properties have EPCs between C and E, highlighting a large challenge but also major potential for improvements which will directly help people with the cost of heating. Existing energy efficiency standards, national policy, majority of grants, and most efficiency and heat decarbonisation projects have also focused heavily on domestic properties. These facts, in addition to the imperative of meeting national fuel poverty targets which are linked to domestic properties, have led to domestic properties becoming a focus for the coming 5-10 years.

Non-domestic: However, non-domestic buildings also have an important role to play. There are 8,090 non-domestic buildings in the Scottish Borders. Almost 80% of these are located either in an urban area or a well-connected accessible area. This presents an opportunity for planning and delivering retrofit

interventions collectively across domestic and non-domestic buildings. Non-domestic buildings are also an important factor for heat network viability as they can have more heat demand as well as different heat demand timings to domestic properties leading to potentially greater and more stable demand commonly known when conducting heat network planning as anchor loads. There remain challenges around limited data on the non-domestic building stock, especially regarding building performance due to the low proportion of EPCs in the sector. There is also limited clarity on the route to decarbonising non-domestic buildings, with proposals in the early stages of consultation on the Heat in Buildings Bill.

Heat networks: There are multiple towns which have been identified by the LHEES analysis to show promise of heat networks at a sufficient scale and density to be taken forward. This includes core zones with substantial heat demand to present a likely viable business case, potential wider zones mostly as expansions of core zones, and future zones which would become viable through proposed developments. The council is committed to the expansion of heat networks wherever feasible as they present the most viable decarbonisation option. As such it is already conducting a feasibility for a heat network at the Lowood development site at Tweedbank, east of Galashiels, where a core zone has been identified. The council is also undertaking pre-feasibility work in Croft Street (Galashiels) assessing the viability of a heat network based on waste heat from the sewerage system. These projects are providing crucial opportunities to gain experience in supporting growth of heat networks and will be critical to scaling these throughout the identified potential zones.

While heat network opportunities have been identified for areas with the largest current or potential heat demand, the council has also investigated the potential for communal heating systems where they align with identified Delivery Areas. Communal heating systems are small networks which can provide heating to a single larger building (such as a block of flats) or a cluster of buildings where there isn't sufficient demand for a heat network, such as in rural or less urban areas. They can be more cost efficient than individual heat pumps where the right set of conditions exist.

The Council will continue to uncover how best to support rural households in the short and medium term, including harnessing the support available through ongoing projects/activities which support these stakeholders. Recent examples of this support include air source heat pump installations in the remote and rural area of Greenlaw.

As part of the data-led process, the council used data analysis and geographic mapping to assess the priorities associated with the LHEES Vision. For the cost of heating priority, the council focused on areas where there is the greatest concern for poor energy efficiency as the driver for fuel poverty (Figure 1). This helped to identify strategic zones where we should focus efforts on improving energy efficiency, such as building and growing existing fuel poverty programmes, further collaboration with social housing providers or targeting government funding more strategically. These zones were also the basis for identifying further "Potential Delivery Areas" as specific locations where new retrofit and heat decarbonisation projects could be introduced, and existing ones expanded. These Delivery Areas are indicative areas based on initial analysis and forward planning, but the Council will explore the feasibility of other areas within Scottish Borders as the Strategy matures. Additionally, the Council is still committed to working with Registered Social Landlords on other projects or opportunities irrespective of whether they fall within an identified Delivery Area.

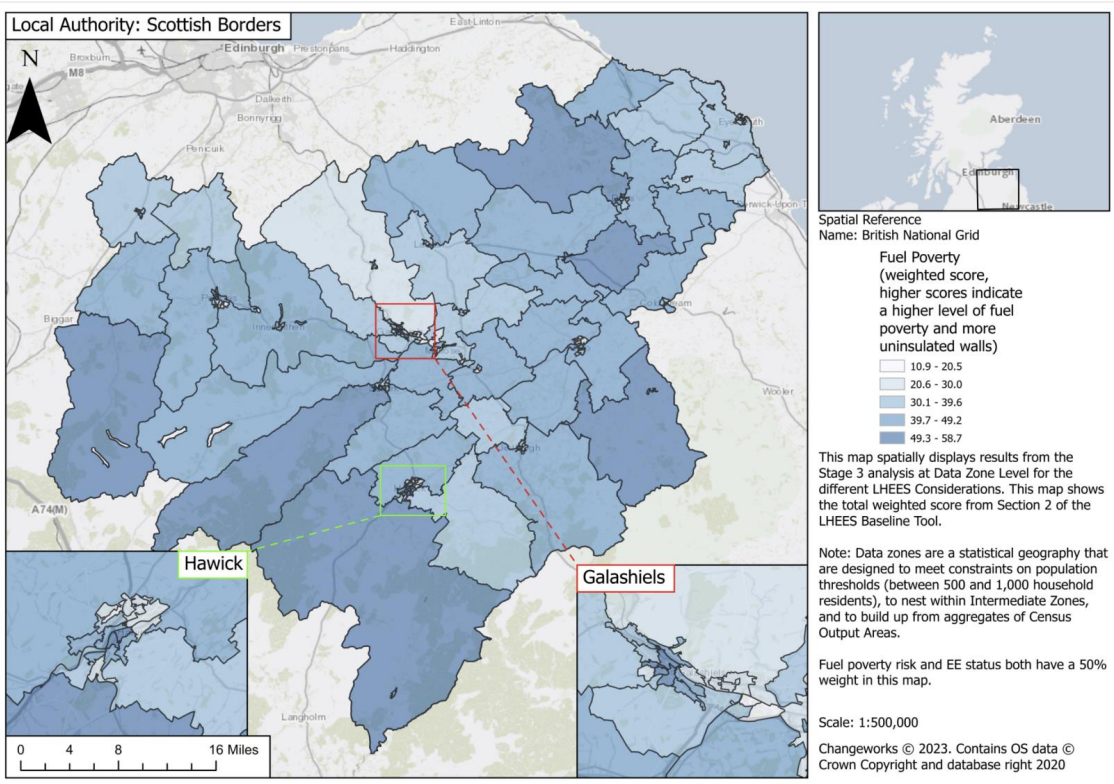


Figure 1: Areas with the highest indication of fuel poverty. This map shows a weighted score that combines energy efficiency, income, and other socioeconomic values.

To address its second priority of the LHEES Vision, heat decarbonisation, the council analysed the role of heat pump installation across the Scottish Borders, including the on-gas and off-gas zones which are heat pump ready. These maps and results are discussed in section 9. Figure 2 provides an example of one such key strategic consideration covering 'heat pump ready' properties (otherwise known as Category 1). These properties typically have a good level of energy efficiency and either ready for a heat pump or could be made so with relatively non-disruptive measures (e.g. loft insultation). They have wall insulation, are not listed or in a conservation area and do not have a communal main heating system. Properties such as these in off-gas grid areas are usually 'low regrets' opportunities of high importance since their heating systems are costly to run and create high levels of emissions and other pollutants but may already have a hot water central heating system which is suitable for an individual or communal heat pump. While these are the 'lowest regrets' Delivery Areas, the LHEES has considered all types of properties (including on and off-gas, mixed tenure, and those with poor energy efficiency) and the Delivery Plan has provided delivery areas covering each of these types of priorities.

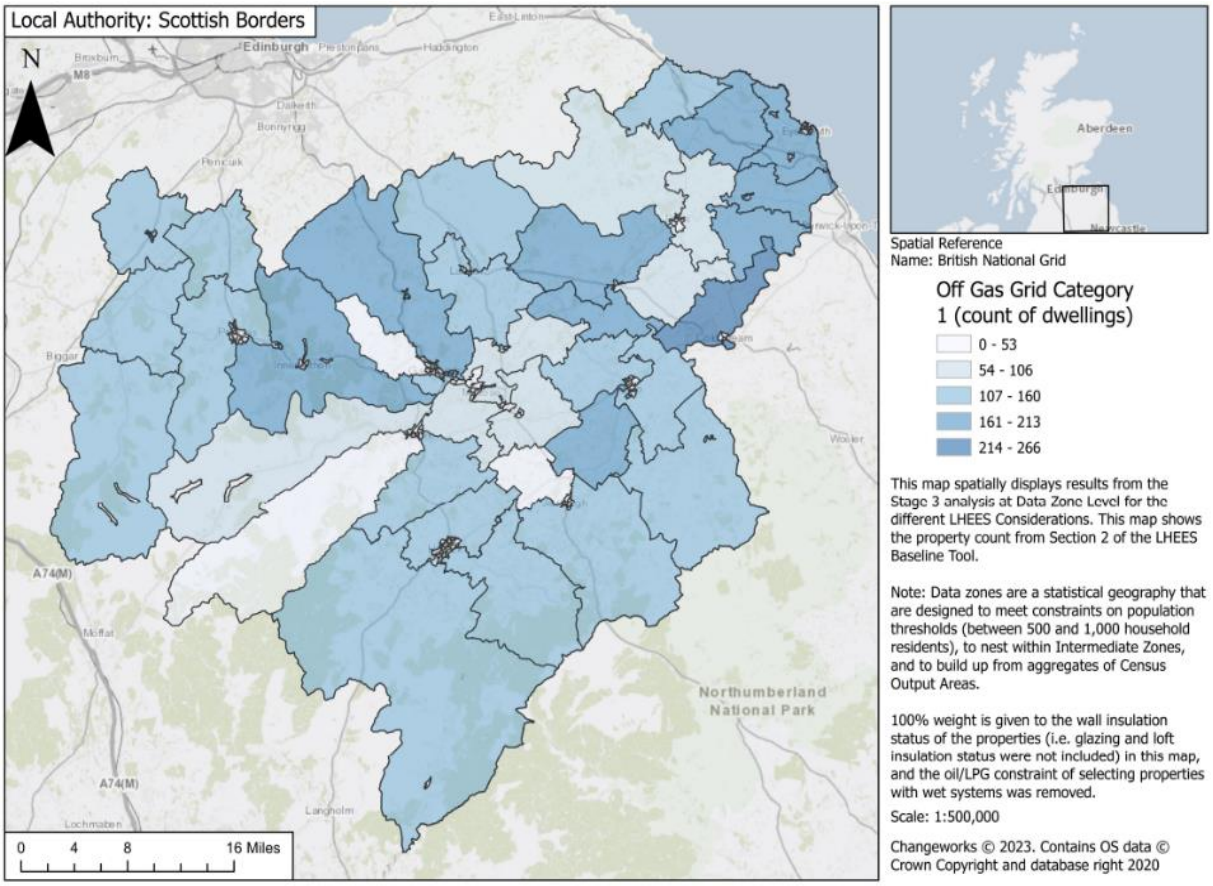


Figure 2: This map represents the number of heat pump ready properties. These are typically well-insulated and ready for a decarbonised heating system.

As part of its second priority of heat decarbonisation, the council also investigated heat network opportunities. This was done by mapping areas with the highest level of heat demand density to reveal the most viable areas which are presented in the Delivery Plan.

The LHEES will look to leverage both energy efficiency and heat decarbonisation opportunities to unlock the benefits of this third priority of the LHEES vision, Just Transition. The Delivery Plan, which defines projects covering these priorities over the coming five years, will be geared to use initiatives which support local economic development, improvement of regional skills, employment and supply chain growth. These will deliver on net zero and fuel poverty targets while building community wealth.

2 Glossary

Terms	Description
Anchor Load	A building requiring a consistent, enduring need for heat, ensuring a reliable demand for a heat network operator, thereby contributing to the economic viability of the network.
Baselining	Baselining is the purpose of understanding at local authority or strategic level, the current status of the buildings against the LHEES Considerations, Targets and Indicators.
Building-level Pathway	As part of LHEES Stage 5, a building-level pathway is the outcome of the assessment undertaken using PEAT. It provides the likely energy efficiency retrofit technologies, as well as the low carbon heating system (where applicable) to support building level decarbonisation.
Coolth	Cold as a tradable asset (Cf. heat / warmth).
Criteria	Criteria are the settings applied to the Indicators for each Consideration in order to support Baselining, Strategic Zoning and the identification of Delivery Areas. An example of Criteria is a simple "no" applied to the indicator of "wall insulation (Y/N)" to identify properties with uninsulated walls. Another example is the definition of an "anchor load" within the Heat Networks analysis, which applies a minimum threshold to the "heat demand" Indicator. The LHEES methodology provides a set of default Criteria that local authorities may wish to use, with flexibility to update and augment these to support local needs or for more focused analysis linked to specific actions and project identification within the Delivery Plan.
Data – Alternative	Alternative data can overwrite the Core data to improve accuracy (national to local level of detail, e.g. local housing data to overwrite fields in Home Analytics).
Data – Core	Core data is the data that is essential to complete the minimum requirements of the LHEES analysis. Core data will come from national datasets e.g. Home Analytics or the Scotland Heat Map.
Data – Supplementary	Supplementary data allows inclusion of additional Indicators to inform specific, local based & targets; also, Supplementary data can be used in GIS investigation to complement the Core analysis carried out in any assessment. An example of Supplementary data would be the inclusion of a constraint's appraisal as part of a district heating analysis.
Data Zone	Data zones are groups output areas which have populations of around 500 to 1,000 residents.
Decarbonised heat sources	Heating systems that produce reduced amounts of carbon such as heat pumps and heat networks.
Delivery Area	Delivery areas are at a higher granularity than Strategic Zones. These spatial zones should set out clusters of buildings within a Strategic Zone or across the whole local authority that identify potential solution(s) at a delivery level. They will be an important starting point for identifying a range of projects, regulation and actions that are within the competence of the Scottish Government, local authorities and wider partners (included as actions to be developed in the LHEES Delivery Plan).
Detailed practitioner approach	These Steps form part of the detailed practitioner approach in LHEES Stage 4, Generation of Initial Areas to set out particularly suitable heat network zones and to support project identification.
Electric boiler	A boiler utilising the method of heating water through passage across an element, with emissions correlated to the electricity grid's emissions factor.
Energy Centre	A building where heat is produced.

Energy efficiency interventions	Energy efficiency is the use of less energy to perform the same task or produce the same result. Energy-efficient homes and buildings use less energy to heat, cool, and run appliances and electronics. Energy efficiency interventions include insulation, heating and lighting upgrades, boiler replacements, and new windows.
Energy services company	A company offering energy-related services.
Fuel Poverty	As defined by the Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act 2019, situations where a household allocates more than 10% of their post-housing-cost net income towards fuel expenses, and their remaining income falls below 90% of the UK Minimum Income Standard.
Heat network	As defined in the Heat Networks (Scotland) Act 2021, a (district) heat network is "a network by which thermal energy is distributed from one or more sources of production to more than one building"[1].
Heat pump	A heating system that harnesses thermal energy from sources like air, ground, or bodies of water (such as rivers, seas, or sewers). Through a refrigeration cycle, it transforms this energy to provide heat to the end user. The carbon emissions of a heat pump are contingent on the grid emissions factor.
Indicator	For a given Consideration, the purpose of an Indicator is: 1) to act as a key information field to help characterise and baseline the local authority. 2) to act as a key information field to support strategic zoning and generation of initial delivery areas. 3) if suitable, to act as a key information field to measure progress against Targets over the duration of the LHEES – set out in the LHEES Delivery Plan. For some Considerations, one Indicator may be sufficient, but for others a range may be appropriate.
Intermediate Zone	Intermediate zones are a statistical geography that are designed to meet constraints on population thresholds (2,500 – 6,000 household residents), to nest within local authorities, and to be built up from aggregates of data zones.
Just transition	A just transition is both the outcome – a fairer, greener future for all – and the process that must be undertaken in partnership with those impacted by the transition to net zero. It supports a net zero and climate resilient economy in a way that delivers fairness and tackles inequality and injustice.
LHEES Considerations	The LHEES Considerations are a list of technologies, building typologies and policy priorities used to identify and target interventions. They include: - Heat networks - Off-gas grid buildings - On-gas grid buildings - Poor building energy efficiency - Poor building energy efficiency as a driver for fuel poverty - Mixed-tenure, mixed-use and historic buildings
LHEES Delivery Plan	An LHEES Delivery Plan is a document setting out how a local authority proposes to support implementation of its local heat and energy efficiency strategy.
LHEES Guidance	The LHEES Guidance sets out the production and content requirements for a local authority to prepare a Local Heat and Energy Efficiency Strategy and Delivery Plan. Its purpose is to ensure that a Local Heat and Energy Efficiency Strategy and Delivery Plan contain outcomes and actions that are backed up by robust data and analysis, supported by stakeholder engagement, and that are linked to national and local priorities, plans and targets.

[1] Heat Networks (Scotland) Act 2021, Scottish Parliament (link)

LHEES Methodology	The LHEES Methodology is a more detailed, step by step approach, which includes models, tools and templates, and represents best practice in how to produce an LHEES in accordance with the requirements set out in the LHEES Order and Guidance.
LHEES Stages	There are 8 LHEES Stages proposed in the methodology. The purpose of the LHEES Methodology is to enable the local authority to complete LHEES Stages 1 to 6. The completion of these Stages will provide the local authority with the data analysis and evidence base to enable them to complete their LHEES Strategy and Delivery Plan documentation. There are two LHEES reporting templates included alongside this methodology– LHEES Strategy example template and LHEES Delivery Plan example template. The completion of these two templates will satisfy the completion of LHEES Stages 7 and 8. The 8 LHEES Stages proposed in the methodology are: 1 – Policy and strategy review 2 – Data and tools library 3 – Strategic zoning and pathways 4 – Generation of initial delivery areas 5 – Building-level pathway assessment 6 – Finalisation of delivery areas 7 – LHEES Strategy 8 – LHEES Delivery Plan
LHEES Strategy	An LHEES Strategy is a long-term strategic framework for— - the improvement of the energy efficiency of buildings in the local authority's area, and - the reduction of greenhouse gas emissions resulting from the heating of such buildings
Low Regrets	Interventions or actions that are deliverable in the current policy context and given existing funding and powers.
Mixed-tenure, mixed-use and historic buildings	Mixed-tenure and mixed-use buildings could include a mixture of owner occupied, private rented and social housing, and also non-domestic uses, or simply multiple ownership within the same tenure. Historic buildings include the buildings that are within conservation areas or those that are listed buildings. These categories may require established alternative approaches and regulation for the installation of low carbon heat and energy efficiency solutions and where specific advice and support might be available relating to the installation of these solutions.
Net Zero Carbon	A situation where any carbon emissions are offset by an equivalent amount of carbon being removed from the atmosphere, resulting in no net change in carbon levels.
Passivhaus	A construction standard where buildings attain elevated levels of energy efficiency and user comfort.
Potential Zones	The analysis carried out for strategic zoning and pathways for the heat networks Consideration is to identify potential zones rather than the otherwise used naming convention of Delivery Areas. The potential zones identified are to be included in the LHEES Strategy and should inform actions around further investigation / progression within the LHEES Delivery Plan. The heat networks Consideration analysis and activity carried out within LHEES is also anticipated to support activity related to formal zone designation as required by the Heat Networks (Scotland) Act 2021.
Raster	A matrix of squares, or grid, used as a method of data analysis in GIS. Each cell in the grid contains a value representing information on the cell's contents.
Retrofit	Retrofit is the introduction of new materials, products and technologies into an existing building to reduce the energy needed to occupy that building.
Solar photovoltaic	Technology that transforms sunlight into electrical energy.
Strategic Zone	Strategic Zones present a visualisation of the potential pathways to decarbonise the building stock at a local authority level. These could, for example, be split out by intermediate zone or data zone. They are useful to understand the baseline performance,

	the scale of potential and initial areas of focus, which could be used to inform Delivery Areas and follow on engagement.
Targets	Targets are the measurable aspect of the Consideration and are likely to be taken directly from national and/or local policy documentation, for example net zero by 2045, or EPC C by 2040. Targets are likely to comprise of end-point targets and milestone targets and would sit along a timeline within (and beyond) the LHEES. This timeline would help to prioritise the types of projects undertaken within the LHEES over its duration.
Traditional buildings	These are understood to be buildings constructed before 1919. Modern materials and techniques were used widely in the construction industry from around this time onwards.
Weighting	For some Considerations, one Target and Indicator may be sufficient, but for others a range of Indicators may be appropriate to contextualise and characterise performance against a Target and/or progress towards a Consideration. If multiple Indicators are used in strategic zoning or the identification of delivery areas, a Weighting can be applied based on the importance of each. The LHEES methodology sets out a core set of default Weightings for instances where multiple Indicators are suggested as a default setting. There is flexibility to update and augment these to support local needs or for more focused analysis linked to specific actions and project identification within the Delivery Plan.

3 Introduction

3.1 Overview of LHEES

3.1.1 What is an LHEES?

Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 sets a net zero emissions target for the year 2045 and interim targets for 75% reduction by 2030 and 90% reduction by 2040. Additionally, the Fuel Poverty (Targets, Definitions and Strategy) (Scotland) Act 2019 includes statutory targets for reducing fuel poverty, including for no more that 5% of households to be in fuel poverty and no more than 1% of households will be in extreme fuel poverty by 2040. These targets are closely linked to our buildings since the heat produced by them accounts for approximately 20% of Scotland's emissions and the cost of this heating is a primary driver of fuel poverty.

Local Heat and Energy Efficiency Strategy (LHEES) Order (2022) introduces a statutory requirement for all Scottish local authorities to produce an LHEES and an accompanying Local Heat and Energy Efficiency Delivery Plan (LHEEDP or 'Delivery Plan'). The Delivery Plan details how these ambitions will be delivered over the coming five years through actions, initiatives, and programmes. The LHEES sets out a locally led and area-wide plan for:

- Improving the energy efficiency of buildings across the Scottish Borders area to a reasonable standard.
- Decarbonising the heat supply of all buildings in the Scottish Borders, whether this is through a heat pump, communal heating system or a heat network.

Importantly, the LHEES sets the vision for what needs to be done to all buildings in the Scottish Borders area, thus achieving the LHEES vision will need to be a collective effort involving all property owners who will need to retrofit their respective properties. This is a significant challenge as it will require a major effort to ensure the 62,296 properties in the Scottish Borders are energy efficient and use zero direct

emission heating before 2045. Based on Scottish Government estimates, this transformation will entail close to £1bn of investment made by property owners to meet these requirements.

In addition to building-level improvements, the LHEES also provides the vision for the relevant local infrastructure improvements required to fulfil the national targets and local priorities.

The Scottish Borders LHEES is primarily driven by Scotland's statutory targets for greenhouse gas emissions reduction to net zero and fuel poverty:

- Net zero emissions by 2045.
- In 2040, as far as reasonably possible, no household in Scotland is in fuel poverty.

Though led by national statutory drivers on net zero and fuel poverty, the LHEES also provides an important opportunity to meet these ambitions in the way that benefits the local population. The development of the LHEES has been led by the Scottish Borders Council with input from stakeholders. This engagement has been key to understanding and incorporating the local cross-cutting policy drivers important to the region's priorities.

This strategy aims to achieve the goals described in this section by:

- setting out how each segment of the building stock needs to change, including reaching net zero direct emissions, and the removal of poor energy efficiency as a driver of fuel poverty.
- identifying strategic heat decarbonisation zones, and setting out the principal measures for reducing buildings emissions within each zone: heat pump, communal heating system, or a heat network
- prioritising initial areas for delivery based on national and local priorities

The LHEES and Delivery Plan are 'living documents' which will be updated with information such as new opportunities. An annual update to the documents will be considered if the need for an update reaches the appropriate level of materiality.

3.1.2 LHEES Considerations

The national targets are a useful direction and overarching ambition. However, they are too high-level to understand how to address buildings and infrastructure at the local level.

The LHEES Guidance issued by the Scottish Government recommends that the LHEES should be framed around six "LHEES Considerations" (Figure 3). The LHEES Considerations are more specific and manageable, allowing the council to better grapple with and plan for the priorities. These considerations form the basis for understanding, interpreting, and developing the pathways to decarbonisation. One of the main ways to view this LHEES is as a means to addressing these considerations.

Figure 3: Six LHEES Considerations as defined by the LHEES Guidance

	Consideration	Description
Heat decarbonisation	Off-gas grid buildings	Transitioning from heating oil and LPG in off-gas areas
	On-gas grid buildings	On-gas grid heat decarbonisation
	Heat networks	Decarbonisation with heat networks
Energy efficiency and other outcomes	Poor building energy efficiency	Poor building energy efficiency
	Poor building energy efficiency as a driver for fuel poverty	Poor building energy efficiency as a driver for fuel poverty
	Mixed tenure, mixed-use and historic buildings	Mixed-tenure, mixed-use buildings, listed buildings, and buildings in conservation area

3.1.3 Developing the LHEES

Developing the LHEES is at its core a data-driven process, although it is heavily informed by local knowledge and context, stakeholder engagement and building on existing local and national policies. The council has developed this LHEES in line with the LHEES Guidance issued by the Scottish Government as well as the LHEES Methodology issued by Zero Waste Scotland. These documents follow an eight-stage process summarised in Figure 4 and described below in Table 1.

Figure 4: The LHEES process involved cycles of data analysis guided by stakeholder input and policy context (existing priorities at national and local levels), ultimately feeding into this LHEES document (Stage 7) and the accompanying Delivery Plan (Stage 8).

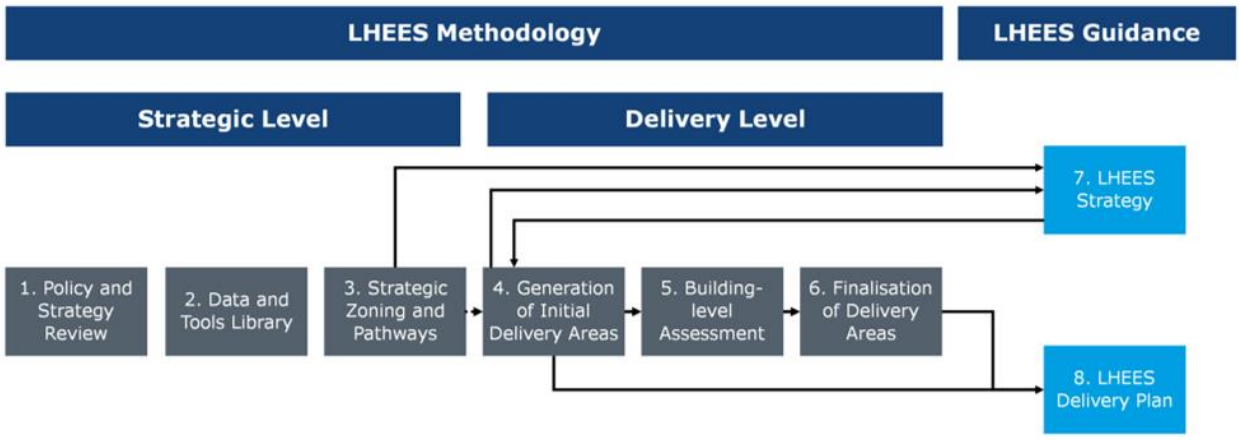


Table 1: This table describes each of the eight stages of LHEES.

Stage	Description
Stage 1: Policy and strategy review	Identifying the local and national policies, targets and strategies that are linked to the LHEES and understanding how these will guide the development of the LHEES. The outputs of this analysis are discussed in section 5.
Stage 2: Data and tools library	Developing a library of all appropriate data and tools that supported analysis in subsequent stages of the LHEES.
Stage 3: Strategic zoning and pathways	First, establishing a baseline for the Scottish Borders region's existing building stock including characteristics, energy efficiency levels and heat supply and performance (summary provided in sections 8.2 and 8.3). Second, this data was then analysed through the lens of the LHEES Considerations (as discussed in section 3.1.2) to develop a set of 'strategic zones'. Strategic zones provide an overview of the key challenges and opportunities across the region. This analysis is summarised in section 9.
Stage 4: Generation of initial delivery areas	The data is used to generate potential delivery areas driven by the LHEES Considerations. These delivery areas define the opportunities in the form of potential projects which can be delivered by stakeholders with support from the council.
Stage 5: Building-level pathways assessment	Further analysis is carried out to assess the interventions required to decarbonise heating and improve energy efficiency in properties in each delivery area, including a quantification of financial costs and carbon reduction benefits. This is based on data analysis which defines interventions required and financial and carbon implications for buildings across the Scottish Borders.
Stage 6: Finalisation of delivery areas	Using the outputs from stages 1-5, the delivery areas are finalised into a set of projects after giving consideration to local prioritises and any existing local programmes works.
Stage 7: LHEES Strategy	Based on the findings in stage 1-6, this LHEES Strategy document provides a short and long-term focus of LHEES at the strategic level.
Stage 8: LHEES Delivery Plan	The accompanying Delivery Plan sets out how the council will implement the LHEES through the next 5 years, based on the priorities identified by the LHEES Vision (section 6) and building on existing progress made by the council (section 7).

3.1.4 Stakeholder Engagement Summary

Given that the LHEES is an area-wide plan for the whole of Scottish Borders, collective working is crucial for it to succeed. In the practical sense, while the council will achieve net zero for its own buildings the LHEES at large will be delivered by wider stakeholders (i.e. building owners and occupiers) with enablement support from the council insofar as possible. Stakeholder engagement is important to the LHEES process as it provides a strong basis for collective action by local communities, the council, investors, developers and wider stakeholders. Engagement allows key stakeholders to raise their concerns, identify collaboration opportunities, pinpoint areas for targeted intervention, and identify low regret measures or opportunities during the development stages. Collective action will be necessary as the council with its limited resources can only address the select most high-priority buildings and infrastructure developments. To achieve a true area-wide transformation, all residents and organisations

need to act collectively as stakeholders to retrofit their properties and, where relevant, collaboratively invest into infrastructure opportunities.

The Council has engaged with stakeholders to develop the local energy efficiency policies in relation to the new Local Housing Strategy 2023-2028 particularly in relation to Priority 3: Improved energy efficiency of homes and a reduction in fuel poverty while supporting a Just Transition to Net Zero through decarbonising domestic heating and energy. The council has continued to build on this engagement throughout the LHEES development process.

LHEES stakeholder engagement has included the following actions:

- Stakeholder mapping to identify key stakeholders to support the development and implementation of LHEES.
- Initial workshops to determine the scope of LHEES.
- Establishment of a project steering group within the council to ensure joined up supportive work around the council estates, with a view to using the estate as an exemplar and leader to demonstrate emission reductions.
- Engagement with internal council teams, including housing, estates, procurement, planning and other teams to adopt broad set of ideas into the documents and address queries.
- Ongoing meetings with social landlords to understand challenges with the existing building stock and scheduled works relating to energy efficiency and decarbonisation, LHEES milestones and the best way to align existing efforts with the ambition of the LHEES.
- Ongoing meetings with the Distribution Network Operator (DNO) Scottish Power Energy Networks (SPEN) to discuss their key role in supporting the delivery of LHEES. Additionally, engagement with other utility providers in relation to development of heat networks (for example with Scottish Water in relation to heat network opportunities).
- Ongoing engagement with wider public bodies such as NHS Borders, Police Scotland, Scottish Fire and Rescue, and local estates about their focus to align plans with the LHEES.
- Interactive workshops with stakeholder groups to explore and discuss initial Strategic Zones, Delivery Areas and recommendations alongside the wider policy, strategy and delivery environment.
- Interactive workshops with stakeholders to gather feedback on the finalised Delivery Areas and potential heat network zones (incorporating analysis to date), and exploring key actions, enablers and challenges to support content for LHEES Strategy and Delivery Plan.
- Developed stakeholder engagement sub-programme as part of the Delivery Plan, using a deliberative approach to gathering interests from parties to drive the LHEES.
- The council aims to continue engagement with housing associations on retrofit plans and feasibility of the development of heat networks. This will be prioritised for new developments planned by the housing associations. The main associations identified are Eildon Housing Association, Berwickshire Housing Association, Waverly Housing Association and Scottish Borders Housing Association. Future engagements are planned with boards and management of multiple housing associations, including Eildon, Scottish Border and Berwickshire Housing Associations.
- The council also intends to engage and present at area partnership meetings for further public engagement. The council will look to enter dialogue with community groups to build on previous discussions on energy and renewable opportunities, and to feed into the strategic long-term

effort for decarbonising heat in buildings and improving their energy efficiency across the entire local authority area.

- Scottish Borders Home Energy Forum has been a key part of engagement where the LHEES has been a standing agenda item for the last 18 months to ensure that delegates as part of the forum have remained informed and engaged in the development of the LHEES.

The council recognises that engagement with stakeholders is key and a long-term commitment that is coming out of this LHEES. Future engagement will need to involve mutually beneficial arrangements to explore best options and opportunities. As any project goes through feasibility studies, engagement strategies and delivery partners will be identified and be directly involved to continue the commitment of effective stakeholder management.

3.1.5 Consultation Process

Scottish Borders Council placed the upmost importance on consulting with all relevant bodies and the public prior to the publication of this LHEES. This was aligned to the commitment to a cohesive and collaborative approach which maximises benefits to local organisations and constituents. Consultation took place through multiple methods and avenues to ensure coverage of the broadest audience possible and provide opportunities to disseminate information about LHEES and record comments, feedback and queries. This included engagement sessions, outreach activities, informal discussions and communication via formal channels. This was underpinned by an open consultation via the council's consultation portal, CitizenSpace, which invited comments and feedback from the public. This sets out the approach that the council will continue through reiterations of future LHEES.

3.1.6 LHEES Strategy Content

This strategy is structured to align with the LHEES Guidance that was issued by the Scottish Government. It covers:

- An overview of the key concepts in the LHEES, such as an exploration of fuel poverty, energy efficiency, decarbonisation technology options and other topics (Section 4).
- The national and local policies and strategies which have fed into the LHEES, including a summary of the route map and targets to improve the energy efficiency, decarbonise the heat supply and develop heat networks (Section 5).
- Scottish Borders' vision on heat decarbonisation and energy efficiency in buildings, explaining how the council has used partnerships and stakeholder working to combine national and local priorities into one unified LHEES Vision for the region (Section 6).
- The progress that Scottish Borders has already made towards this LHEES Vision, in addition to what ongoing works in the area may align with the LHEES (Section 7).
- An overview of the current performance of the building stock across the Scottish Borders, highlighting the scale of the challenge and priorities going forward (Section 8).
- The strategic zones and pathways to decarbonise heat and improve the energy efficiency which have been identified through the LHEES development process. The zones and pathways are driven by the LHEES Vision (Section 9).

4 Key Concepts in LHEES

4.1 Fuel Poverty

Fuel poverty is a major national policy driver for LHEES since it is imperative to eradicate fuel poverty if Scotland as a country is to make a just transition to net zero. Fuel poverty is an equally important local priority for the council to work towards a future where people living in the Scottish Borders are free of financial stress related to warming their homes. In Scotland, a household is defined as being in fuel poverty when[2, 3]:

- after housing costs, the total fuel costs needed to maintain a satisfactory heating schedule are more than 10% of the household's adjusted net income; and
- if, after deducting fuel costs, housing costs, benefits received for a care need or disability, and childcare costs, the household's remaining income is insufficient to maintain an acceptable standard of living.

The Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act 2019, set the above definition along with new statutory targets, including the aim to have no more than 5% of households in fuel poverty and 1% in extreme fuel poverty by 2040[4]. One of the most relevant pressures on fuel poverty is poor building energy efficiency which drives up heating costs and contributes to fuel poverty. As the LHEES concerns the improvement of buildings and development of infrastructure, it is important to consider buildings and areas where poor energy efficiency is a driver for fuel poverty. This has been one of the most important factors in deciding what to prioritise for LHEES.

According to the most recent data, fuel poverty affects around 29% of households in the Scottish Borders, where the rural nature of the area, the type of housing and energy efficiency, type of heating systems and the low wage economy, contributes to higher levels than the Scottish average.

Table 2: Levels of Fuel Poverty and Extreme Fuel Poverty

	Fuel Poverty	Extreme Fuel Poverty
Scottish Borders (Scottish House Condition Survey 2019)	29%	14%
Scottish Borders (Home Analytics)	28%	16%
Scotland Average (Scottish House Condition Survey 2019)	25%	12%

Ongoing pressures on energy prices and cost of living have had a major negative impact, pulling many people into fuel poverty and pushing households already in fuel poverty further into extreme fuel poverty. While updated data is not available, it is understood by the council that the fuel poverty rate is likely much higher than these estimates due to the ongoing cost of living crisis. Recent modelling suggests that the Scottish national fuel poverty rate reached 35% at October 2022, having gained 10 percentage points since the 2019. There is reason to believe that the current fuel poverty rate for the Scottish Borders is yet higher.

[2] Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act 2019 (link)
[3] Office of national statistics. How fuel poverty is measured in the UK: March 2023 (link)
[4] Climate Change (Emissions Reduction Targets (Scotland) Act 2019 (link)
[5] Scottish House Condition Survey 2017-19, Energy Saving Trust - Home Analytics Scotland V3.8

The council also acknowledges the importance of affordable, energy efficient housing towards the general health and wellbeing of our residents, as well as its relation to our public services. The Building Research Establishment estimated in 2021 that the additional cost to the NHS to treat those affected by poor housing at £1.4 billion per year. Additionally, Healthy Housing for Scotland have outlined how funding low carbon, climate-resilient and healthy homes promote health; in other words, energy efficient homes can improve health and wellbeing particularly when targeted to those with low incomes and with existing poor health.

The Council's Local Housing Strategy 2023-2028 already acknowledges the clear benefits to people's health and wellbeing through having access to a permanent, well maintained and warm home. The LHEES seeks to enable these co-benefits and the Strategy will be dependent on continually work in partnership with key stakeholders to decrease the impacts of cold housing for individuals and organisations.

Care will also be taken to mitigate potential risks which unintended consequences of energy efficiency and heat decarbonisation could cause on exacerbating fuel poverty, e.g., poor quality installations and inequities in smart meter access. The council will continue to monitor progress and prevalence of issues in the area and work to mitigate any factors within its influence which could worsen fuel poverty in Scottish Borders.

4.2 Energy Efficiency

A more energy efficient building is one which uses less energy to provide a given amount of heating or power, in turn reducing carbon dioxide emissions from reduced grid electricity and/or fossil fuel use. The energy efficiency of buildings is usually assessed through Energy Performance Certificates (EPCs). EPCs use an A to G rating scale, where A is the most efficient and G is the least efficient. The certificate also lists the potential rating of the building if all cost-effective measures are installed; these can include wall, floor and loft/roof insulation and double glazing to reduce the rate of heat loss from the building, and therefore indirectly reduce the amount of energy required to keep the building warm. Efficient (LED) lighting also requires less energy to produce the same amount of light than traditional incandescent bulbs. Efficient heating controls can improve the energy efficiency of a building by either reducing the number of hours the heating is on (for example when the building isn't occupied) or by slightly lowering the target temperature[6]. These measures will be a crucial component for Scotland's building stock to be aligned with the national target of 75% emissions reduction by 2030[4].

The national targets for improving the energy efficiency of Scotland's domestic stock have been established through the Scottish Government's Heat in Buildings Strategy and being taken forward through the Heat in Buildings Bill:

- All private rented sector properties to reach a minimum standard equivalent to EPC C, where technically feasible and cost effective, at change of tenancy, with a backstop of 2028 for all remaining existing properties.
- All owner-occupied properties to reach a minimum standard equivalent to EPC C, where technically feasible and cost effective, with a backstop of 2033.
- Targets relating to social housing were previously set through the Energy Efficiency Standard for Social Housing (EESSH). EESSH2 was confirmed in 2019 and set a target for all social housing to

[6] Office for National Statistics. Energy efficiency of housing in England and Wales: 2022 (link)

achieve EPC B (or is as energy efficient as practically possible) by 2032. In addition, no social housing below EPC band D is to be re-let from December 2025 subject to temporary specified exemptions[7]. The newly proposed Social Housing Net Zero Standard has been proposed as a replacement for EESSH2; it will incorporate both a minimum fabric efficiency rating (measured in a maximum annual energy use under a certain threshold; kWh/m^2/year) to be achieved by 2033 and the requirement for zero direct emission heating by 2045.

- Through the Heat in Buildings Bill, the Scottish Government has indicated that it will not introduce an energy efficiency standard for non-domestic buildings due to their significant variability and diverse needs, making a single standard too limited.

Care will be required when taking a fabric first approach to energy efficiency building improvements. Buildings need to be energy efficient and wind and watertight in the first instance however some barriers will need to be overcome when treating traditional properties. Whilst some energy efficiency measures may cause some disruption, the benefits to homeowners' quality of life and living costs will bring about long-term benefits.

4.3 Heat Decarbonisation Technologies and Renewables

The Heat in Buildings Bill has proposed various timelines and requirements for buildings to reach net zero. At most, all buildings will be required to have a zero direct emission heating system by 2045. However, certain types of buildings may be required to replace their heating systems before this deadline. These include public sector organisations (who may have to complete the transformation by 2038) or social landlords (who may be required to meet interim targets). There are many types of technologies to decarbonise the heat supply of buildings. The council takes a technology agnostic approach and will encourage and support the use of solutions which best meet the financial and practical needs of property owners.

Most heating system transformations will involve the installation of a heat pump or connection to a heat network[8] or communal heating system since these are currently the most feasible solutions. A heat pump is a device that absorbs heat from one environment and transports it into another using electricity. For example, an air-source heat pump extracts heat from the air outside and transfers it into the building. This heat can then be used to warm water for radiators, underfloor heating systems and hot water use. Conversion to heat pumps enables properties to shift from polluting heating systems to those which use electricity and do not produce any direct emissions. Conversion is typically carried out at an individual level (e.g. a heat pump for each property), although where the right set of circumstances exist it can be economically beneficial to do so via a communal system.

A communal heating system is a system whereby a shared heat source supplies a group of properties. These systems are smaller than a full-scale heat network as they service a limited number of properties, such as properties in a block of flats, or a cluster of buildings joined together or proximate to each other (e.g. retirement villages, commercial zones, terraced housing and similar). Communal heating provides similar benefits over individual heat pumps as a heat network does (such as lower cost heating due to higher efficiency of the system and reduced maintenance cost) although not to the same degree due to its smaller economies of scale. These systems also provide the benefit of being able to decarbonise properties at scale.

[7] The Energy Efficiency Standard for Social Housing (EESSH2), Scottish Government (link)
[8] Heat networks are discussed in section 4.4

Home Analytics data indicates that 912 properties in Scottish Borders have their primary heating as 'Communal Heating.' Typically, these are small and localised systems serving one building of separate flats, or properties in the direct vicinity, such as a farm and adjacent farm cottages. These are mostly retirement villages/flats or social housing blocks/flats/terraces.

Solar PV panels can provide electricity that a property can use directly, store for future use, or be exported to the grid. Scottish Borders Council has included Solar PV and battery storage technology as a "special project" within existing fuel poverty retrofit programmes (see section 7.3 further details). Effective generation and safe storage of electricity can contribute to an energy efficient property and also address the pressures that lead to cost of heating and fuel poverty.

4.4 Heat Networks

Heat networks (also known as district heating) supply heat from a central source to consumers, via a network of underground pipes carrying hot water. Heat networks can cover a large area such as an entire city or be fairly local supplying a small street. The central heat source is often referred to as 'the energy centre' which can be more efficient and less costly to maintain than the combined individual property-level heat sources. There are many possible technologies that can provide the input to a heat network including heat pumps, energy from waste (EfW) facilities, waste heat sources, and industrial processes. A heat network avoids the need for dedicated heat pumps for individual properties (though in some types of heat networks this can be an optional addition as the heat generated by individual systems can be added to the system and shared). Heat networks can be various sizes and serve various combinations of building types. They can also be extended over time by adding new connections (heat demand) and new energy centres (heat sources) to the network. Where there are sufficiently dense areas, it will be the council's priority to support the development of heat networks as the preferred decarbonisation solution.

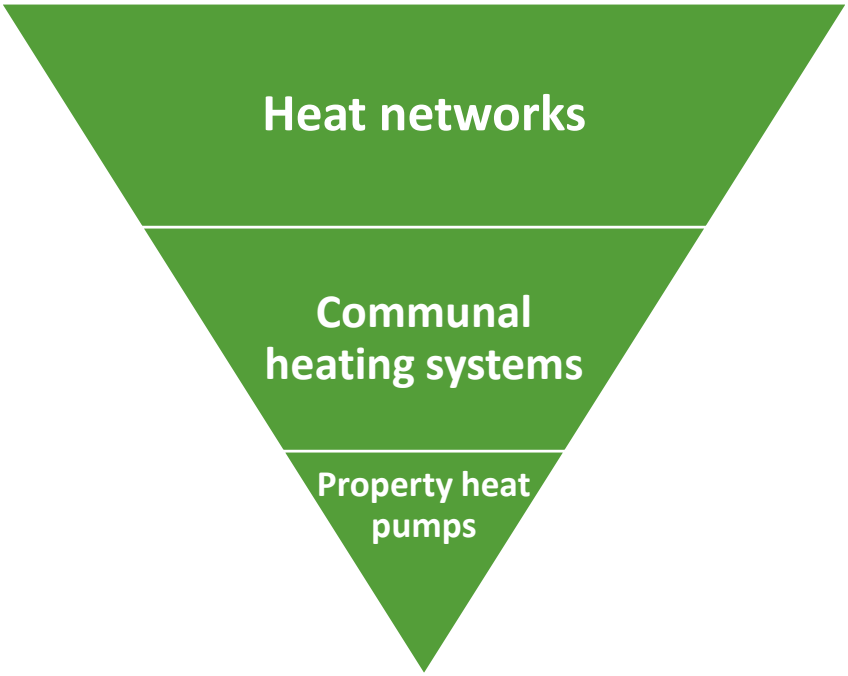


Figure 5: This decarbonisation technology hierarchy is based on the priorities identified in the LHEES Vision. Where possible, the council will support heat networks, followed by communal systems and then individual heat pumps. This will take into consideration exceptions and needs of each local area but serve as a strong influence in guiding the decarbonisation solution.

The Heat Networks (Scotland) Act 2021[9] has set statutory targets to ensure that the combined supply of thermal energy by heat networks in Scotland reaches 2.6TWh in 2027 and 6TWh by 2030 (3% and 8% of total demand, or approximately 120,000 and 400,000 additional homes respectively). The council will play its role in supporting

[9] Heat Networks (Scotland) Act 2021 (link)

these targets and, while doing so, bring benefits to the people of the Borders.

The council has placed importance on efficiently scalable technologies. These systems provide the best opportunity to decarbonise properties at the pace needed to meet national and local ambitions, especially when the local authority area is faced with a supply chain challenge. There aren't sufficient skilled workers to serve the area's decarbonisation needs and those which are present are costlier due to long travel distances involved. A smaller number of larger projects are more economical for customers, both in terms of installation and operating costs, and more attractive to suppliers as a business opportunity due to the likelihood of larger revenues and margins. It is the council's view that this hierarchy could unlock major potential to decarbonise properties and help control the cost of heating (Figure 5).

4.5 Resources and support

There are a range of existing initiatives that can support private building owners with improving energy efficiency and decarbonising heat. There are several organisations and groups which support the implementation of energy efficiency and decarbonisation projects:

- Borders Home Energy Forum.
- South of Scotland Enterprise (SOSE).
- The South of Scotland Regional Economic Partnership (REP).
- Edinburgh and South East Scotland City Region Deal.

Additional detail on how the council will leverage these support systems to implement the LHEES is provided in the Delivery Plan.

Support for energy efficiency and decarbonisation can also come in the form of multiple funding streams that can enable property owners to pay for the upfront costs of installation, it is likely that costs will be met through a mixture of funding, grants, and owner costs. The Scottish Government funds various initiatives to support various types of property owners and occupiers. The council will seek to leverage this funding and support to maximise the potential benefit for people in the Scottish Borders. The Delivery Plan provides details for how this will be achieved. The key funding and support initiatives are:

- **Area-based Schemes (ABS)[10]:** funded by the Scottish Government and delivered by local authorities, ABS are place-based energy efficiency schemes targeted mainly at improving fabric efficiency of homes in areas with high levels of fuel poverty. ABS enables local authorities to develop and deliver energy efficiency programmes by identifying the localities, properties and types of measures which could be implemented and targeting funding toward these. This funding can supplement owners' contributions or social landlords who can choose to insulate their homes at the same time, making it an efficient process as well as an enabler for retrofitting mixed-tenure properties. Some properties which meet certain eligibility criteria can be retrofitted using funding from UK Government's Energy Company Obligation (ECO) scheme. Therefore, ECO funding is also usually considered as part of ABS programmes. The council delivers the ABS scheme across the local area in close partnership with social landlords.

- **Home Energy Scotland[11]**: this advice and funding service provides owner-occupiers and private landlords and tenants with support to improve the energy efficiency of their properties. It includes

[10] Area-based Schemes (link)
[11] Home Energy Scotland (link)

grant and loan support as well as advice services to help owners with the process of installing energy efficiency measures, zero direct emission heating and renewable energy.

- **Warmer Homes Scotland**[12]: this programme offers funding and support to households struggling to stay warm and manage energy bills by carrying out property assessments and installing a range of energy saving improvements which can include insulation, heating and renewable measures. Eligibility for this programme includes private homeowners and tenants of a private-sector landlord.

- **Business Energy Scotland**[13]: this programme offers advice and funding for small and medium enterprises through advice on saving energy, money and creating a more sustainable business. Businesses can choose from various options including lighting assessments, solar PV assessments and energy efficiency assessments which includes renewable heat technologies, insulation and window glazing. This programme has identified over £200 million in savings to date for businesses.

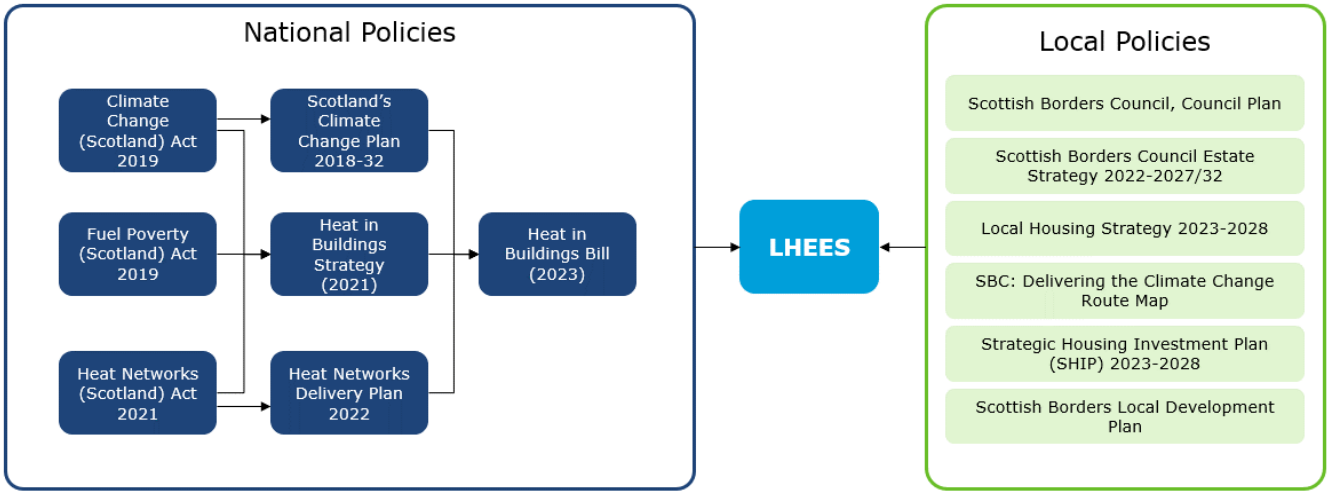
- **Community and Renewable Energy Scheme (CARES)**[14]: this programme is managed by Local Energy Scotland and supports communities in the energy transition to net zero emissions. CARES supports community organisations and charities on a wide range of renewable projects including installing renewable technologies in community buildings, assigning consultants to carry out feasibility studies and supporting potential opportunities for energy generation.

5 Policy Context

This LHEES is driven by considerations given to Scotland's statutory targets for greenhouse gas emissions reduction (net zero by 2045) and fuel poverty (no more than 5% of households in Scotland in fuel poverty by 2040) alongside various other national and local policies and strategies. Figure 6 shows how these policies intersect and link into the LHEES.

[12] Warmer Homes Scotland, Scottish Government (link)
[13] Business Energy Scotland (link)
[14] Community and Renewable Energy Scheme (CARES) (link)

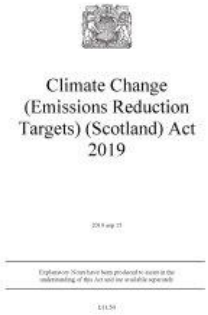
Figure 6: Relevant National and Local Policy for the Scottish Borders LHEES

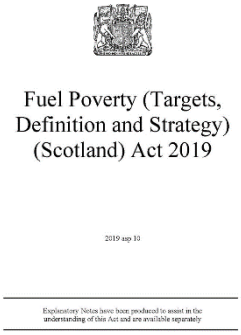
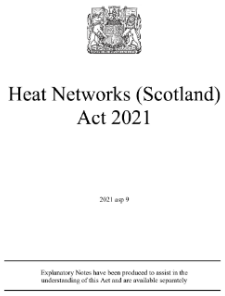


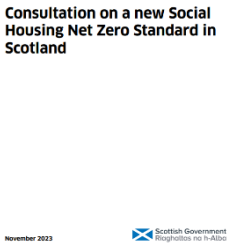
5.1 National Policies

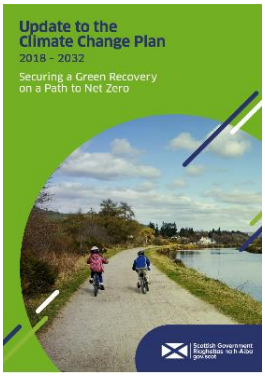
Linking the LHEES to national policies is important to ensure national alignment to Scottish Government and other local authorities. It is also necessary to ensure the funding, policy, regulatory and other opportunities are not missed by the LHEES. The primary national policies central to the development of the LHEES are detailed in Table 3, along with their aims and how they are relevant and have been linked to the LHEES.

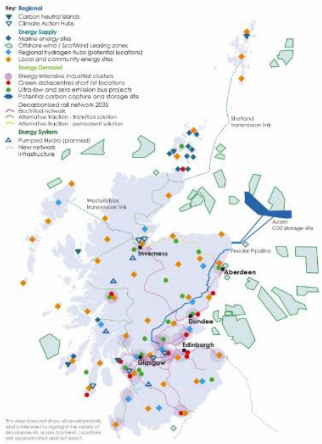
Table 3: Relevant National policies for the Scottish Borders LHEES

National policies	Aims	Links to Scottish Borders LHEES
Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 	This sets emission reduction targets for Scotland, including interim targets to ensure sufficient progress: - 75% reduction by 2030 - 90% reduction by 2040 - Net zero emissions by 2045	The LHEES will align with these targets and support the national effort by reducing emissions from buildings in the Scottish Borders. This will be achieved through energy efficiency upgrades and heat decarbonisation.

Fuel Poverty (Targets, Definitions and Strategy) (Scotland) Act 2019  Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act 2019 2019 asp 10 Explanatory Notes have been produced to assist in the understanding of this Act and are available separately	This includes statutory targets for reducing fuel poverty and introduces a new definition of fuel poverty to better align with relative income. Targets include that by the end of 2040: - No more that 5% of households will be in fuel poverty. - No more than 1% of households will be in extreme fuel poverty. - The median fuel poverty gap of households in fuel poverty is no more than £250 in 2015 prices before adding inflation.	These targets also apply to individual local authorities. Thus, it is a target for Scottish Borders to achieve the above. This LHEES will contribute to the statutory target by eliminating poor energy performance as a driver for fuel poverty, thus helping to reduce fuel poverty.
Heat Networks (Scotland) Act 2021  Heat Networks (Scotland) Act 2021 2021 asp 9 Explanatory Notes have been produced to assist in the understanding of this Act and are available separately	This sets out a regulatory framework to support the development of heat networks. It sets targets of 3% of national heat demand to be supplied by heat networks by 2027 and 8% by 2030.	The LHEES will align with this act by maximising the potential for heat networks, ensuring that heat supply within the Scottish Borders will be as efficient, cost effective and future-proof as possible. This will contribute directly to national targets but also benefit residents and businesses.
Heat in Buildings Strategy (2021)  Heat in Buildings Strategy Achieving Net Zero Emissions in Scotland's Buildings Scottish Government	This sets out steps to end emissions from Scotland's buildings and the remove poor energy performance as a driver for fuel poverty. Building on the above three Acts, the focus is on reducing energy demand for space and water heating in homes, workplaces and community buildings using a fabric first approach, followed by conversion to zero direct emission heating. This strategy provides the route map detailing what Scotland's buildings need	LHEES and the Heat in Buildings Strategy are inextricably linked as they are both centred around reducing emissions from buildings and tackling poor energy performance as a driver for fuel poverty. Much of the work for this LHEES is based on the approaches outlined by this strategy.

	to do to help achieve the above targets.	
Heat in Buildings Bill Consultation (2023) 	This Bill is currently being consulted on and includes a comprehensive set of proposals for regulations which will drive forward the goals of the Heat in Buildings Strategy and aspects of the above acts in relation to buildings. It proposes a ban on polluting heating systems by 2045 to support the climate change targets, as well as efficiency targets for homes under all tenures.	This Bill will be instrumental in paving the way for heat decarbonisation. It could lead to regulatory means and support which the council could use to accelerate decarbonisation. The council looks forward to the changes that the subsequent Act will introduce. These will be built into the LHEES once the Act has been passed and further Scottish Government guidance released.
Social Housing Net Zero Standard Consultation (2023) 	After a thorough review of previous standards (i.e. EESSH2), the Scottish Government is currently consulting on a new standard which proposes various options for improving the energy efficiency of and decarbonising social housing. This includes a proposed minimum fabric efficiency standard which defines the energy consumption limit in kWh/m^2/year. In addition, proposals also include a ban on polluting heating systems by 2045 with the possibility of interim targets.	With 23% of dwellings within the Scottish Borders belonging to housing associations this will be a key contributor to through the LHEES. Implementing this standard will ensure that more vulnerable residents who live in housing associations will be at reduced risk of fuel poverty.

Securing a Green Recovery on a Path to Net Zero: Update to the Climate Change Plan 2018-32 	The Climate Change Plan for Scotland sets the Scottish Government's approach to delivering a green recovery, and a pathway to achieve the climate change targets. This includes a focus on low carbon heating for buildings centred around three key areas: - Regulatory change - Delivering significant investment - Supporting supply chain growth	The LHEES is a major step that will contribute to all three key areas relevant in the Climate Change Plan. It will approach the challenge by using the emission reduction priority as a means to also future-proofing homes and workplaces in the Scottish Borders.
Housing to 2040 (2021) 	This strategy sets a vision for housing in Scotland to 2040 and a route map of how housing will become net zero by 2045. The main goal is for everyone to have a safe, good quality and affordable home that meets their needs in the place they want to be. In terms of sustainability priorities this plan sets zero emission targets for new and existing homes and recognises housing as an opportunity to contribute to the green recovery. The target is to have 100,000 affordable homes by 2032, between new builds and refurbishing existing homes, and for all new homes to be of high quality and with zero emission heating.	This strategy is of aligns closely with LHEES priorities, helping to drive the fuel poverty and net zero housing agenda. It has served as an important compass to guide the direction of the Scottish Borders LHEES given almost 90% of properties in the Scottish Borders are domestic.

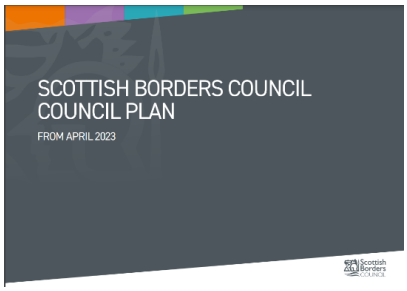
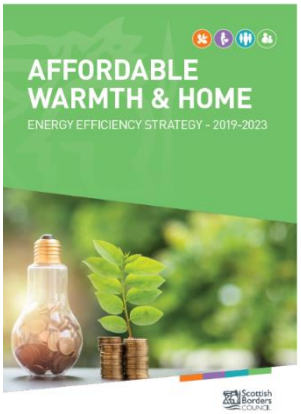
Draft Energy Strategy and Just Transition Plan (2023) 	This draft plan consists of a route map to deliver net zero energy systems that will supply affordable, resilient, and clean energy to Scotland's workers, households, communities and businesses. The priorities in this plan include the decarbonisation of homes alongside a focus on access to affordable, clean energy within a net zero system and can be established in the domestic and non-domestic sector.	The council aims to grow the influence and scope of the LHEES in the future and the area of renewable energy and heat generation and storage will be prioritised for future addition. As part of a just transition, the council aims to drive the potential economic, employment, skills and net zero benefits that renewable energy infrastructure development could bring to the region. This will not only be beneficial but instrumental in the success of LHEES targets.
Heat Networks Delivery Plan (2022) 	This sets out how the Heat Networks (Scotland) Act 2021 will be implemented to maximise the potential for heat networks. It sets out the details of the regulatory regime as well as future work on the wider policy framework, including building assessment reports, heat network zoning, licencing and permitting and more.	The council is committed to maximising the role for heat networks as key enablers in decarbonising buildings at scale as well as making renewable heat available at an affordable cost.
National Planning Framework 4 	This is the replacement framework for National Planning Framework 3 and Scottish Planning Policy where the national spatial strategy for Scotland is set out including spatial principles, regional priorities, national developments and national planning policy.	The council is focused on the LHEES being part of a 'Just transition' which is one of the Spatial principles set out in NPF4 alongside rural revitalisation where sustainable development is encouraged in rural areas. The council will continually follow NPF4 where appropriate.

5.2 Local Policies

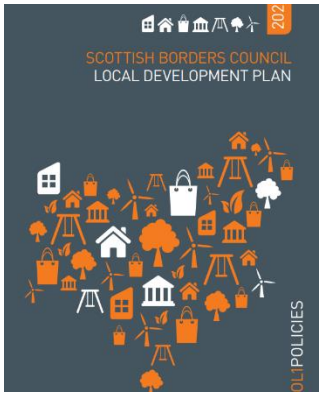
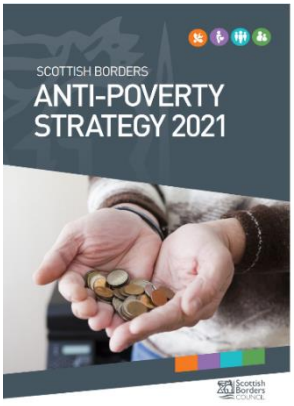
Local policies for buildings and energy have been developed in line with national policies. Thus, the main objectives of the national policies discussed in section 5.1 are already reflected across multiple existing local policies. This LHEES will go yet further to incorporate these national priorities in a more direct way and holistically in one place.

However, the LHEES also provides an avenue for unique locally driven and championed priorities to be bridged with national policies to pave a way for national targets to be delivered while maximising benefits for the people of the Scottish Borders. Various policies, detailed in Table 4, cover themes of promoting affordable warmth, prioritising the well-being of residents, and having a tangible route to achieving net zero which is beneficial for the environment, economy, and people within Scottish Borders. Any works arising from the LHEES will consider and align with these existing policies. These policies all align with various LHEES considerations (as discussed in section 3.1.2) and will work in conjunction with the LHEES to create a strong foundation for implementing projects supporting cross-cutting policy objectives.

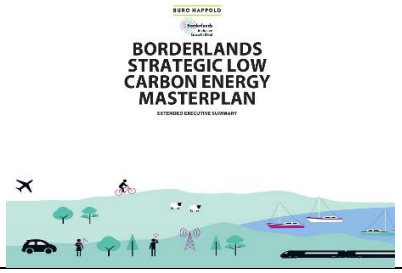
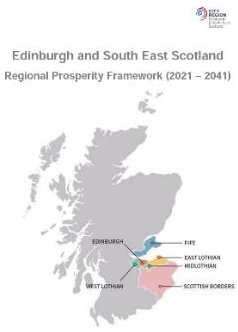
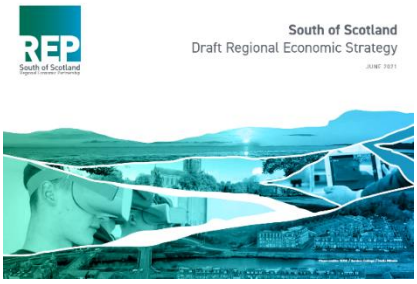
Table 4: Relevant local strategies for Scottish Borders LHEES

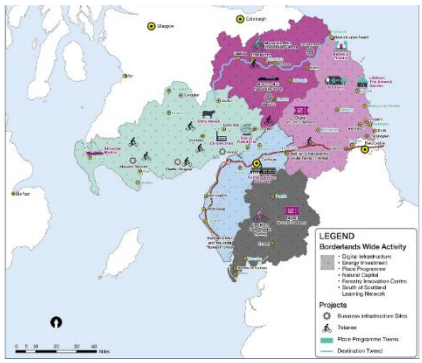
Local Policy and Strategy	Aims relevant for LHEES
Scottish Borders Council, Council Plan 2023 	This Council Plan is based on six outcomes, five of which are focused on improving the wellbeing of citizens and making the Scottish Borders region a more sustainable and better place to live, work in and visit. The 2033 vision for Scottish Borders includes increasing the number of residents living and working in energy efficient homes and premises, powered by green energy sources. This also links to the local priority of accelerating action to adapt to and mitigate the effects of climate change and extreme weather.
Affordable Warmth and Home Energy Efficiency Strategy (AWHEES) 2019-2023 	This multi-agency strategy was designed to support the provision of warm, energy efficient homes for everyone in the Scottish Borders. The three main priorities of the AWHEES were: - To collectively work with partners to improve affordable warmth and energy efficiency in homes; - To explore wider measures to better manage and increase warmth in the home; - To ensure the AWHEES provides opportunities for all in the Scottish Borders. Achievements from this strategy are already becoming apparent with the setup of the Scottish Borders Home Energy Forum (further discussed in section 7.5) which has acted as a catalyst for building collective support for ongoing strategies such as implementation of EESSH 1 and 2, and upcoming funding opportunities are discussed proactively. The LHEES a successor to the AWHEES as it will build on this work in combination with other priorities (e.g. non-domestic buildings and heat networks) as a holistic approach.
Local Housing Strategy (LHS) 2023-2028	The LHS sets out a vision for the supply, quality and availability of housing in the Scottish Borders. The vision of the LHS is "Everyone in the Scottish Borders has access to a home that meets their needs and is part of a sustainable community." The LHS has five strategic outcomes to meet this vision, of which strategic outcome three dovetails with LHEES priorities:

	"improved energy efficiency of homes and a reduction in fuel poverty while supporting a Just Transition to Net Zero through decarbonising domestic heating and energy." It covers the following components: • Work with partners to improve energy efficiency across all tenures. • Develop the Local Heat and Energy Efficiency Strategy for the Scottish Borders. • Implement a public engagement strategy for heat in buildings. • Work with partners to develop the skills needed to deliver energy efficiency & zero emissions heating systems. • Explore wider measures to better manage energy and increase warmth in the home. • Adapt and retrofit existing homes to improve their energy efficiency. Strategic outcome three has been incorporated within the objectives of this LHEES. The other four strategic outcomes from the LHS have also been an important part of developing this LHEES: • Strategic Outcome 1: More homes in well designed, sustainable communities that increase opportunity for all and support our economy to thrive. • Strategic Outcome 2: People have access to homes which promote independence, health and wellbeing. • Strategic Outcome 4: Communities are regenerated through improving the quality and condition of housing and the built heritage. • Strategic Outcome 5: Homelessness is prevented wherever possible, and a range of housing options are provided so people can secure a suitable and sustainable housing outcome as quickly as possible
Strategic Housing Investment Plan (SHIP) 2024-2029	This is the key document for targeting investment in affordable housing within the Scottish Borders. The SHIP defines how affordable housing investment priorities set out in the LHS will be delivered in practice over the period 2023-2028.

	
Scottish Borders Council Local Development Plan (proposed) (2023) 	This plan sets out land use proposals and planning policies intended to guide development and inform planning decisions within the Scottish Borders. It promotes the achievement of the national target of net zero greenhouse gas emissions by 2045, and accords with National Planning Framework 4 (NPF4), including Policy 19, Heat and Cooling, which seeks to encourage, promote and facilitate development that supports decarbonised solutions to heat and cooling demand, including development connected with the expansion of heat networks using and storing heat from low or zero greenhouse gas emission sources
Anti-Poverty Strategy (2021) 	This strategy highlights activity that the council will aim to deliver to help reduce poverty in the Scottish Borders. It includes a key relevant outcome which is for all residents to have the ability to live in warm, affordable homes.

Climate Change Strategy (2018-2028) 	The Climate Change Strategy contains the route map for how the Scottish Borders will reach net zero by 2045 for both the council as an organisation and partners across the region. It contains 25 milestones across five themes, one of which is Energy and has a focus on reducing domestic emissions with an overarching target for annual reductions.
Scottish Borders Council Estate Strategy 2022-2027/32 	The estate Strategy for Scottish Borders Council for the next 5-10 years (2022-2027/32) sets objectives across 5 themes including having a best value estate and sustainability, making the estate fit-for-the-future financially, socially and economically. Some actions include using and maintaining assets that have a long-term viable future, embedding sustainability into estate decisions and to operate a resilient and viable estate. This sets the foundation for building a net zero programme to take the council's estate to net zero emissions, which will demonstrate leadership and encouraging other stakeholders to also take similar actions as part of a collective effort to deliver this LHEES.
Scottish Borders Community Plan (2023/2033) 	This plan looks to highlight what The Borders-wide inequalities are and how the Community Planning Partnership (CPP) together with local communities and businesses can address existing inequalities and improve outcomes. The main outcome placed against the theme of 'Our Place' is for Borders residents to be able to afford to heat their homes and to have more residents living independently in affordable and sustainable homes. The council is in the process of updating the community plan, which will align with this LHEES. The Community Planning Partnership (CPP) has collaborated with local communities and businesses to create this plan to enable residents in the Scottish Borders to live their lives to the full. Two of the four key themes include poverty and good health & wellbeing, with outcomes focused on mitigating the financial challenges of day to day living and reducing health inequalities. The plan is aligned to the LHEES vision, with Scottish Borders' 2045 net zero target influencing and underpinning all outcomes.

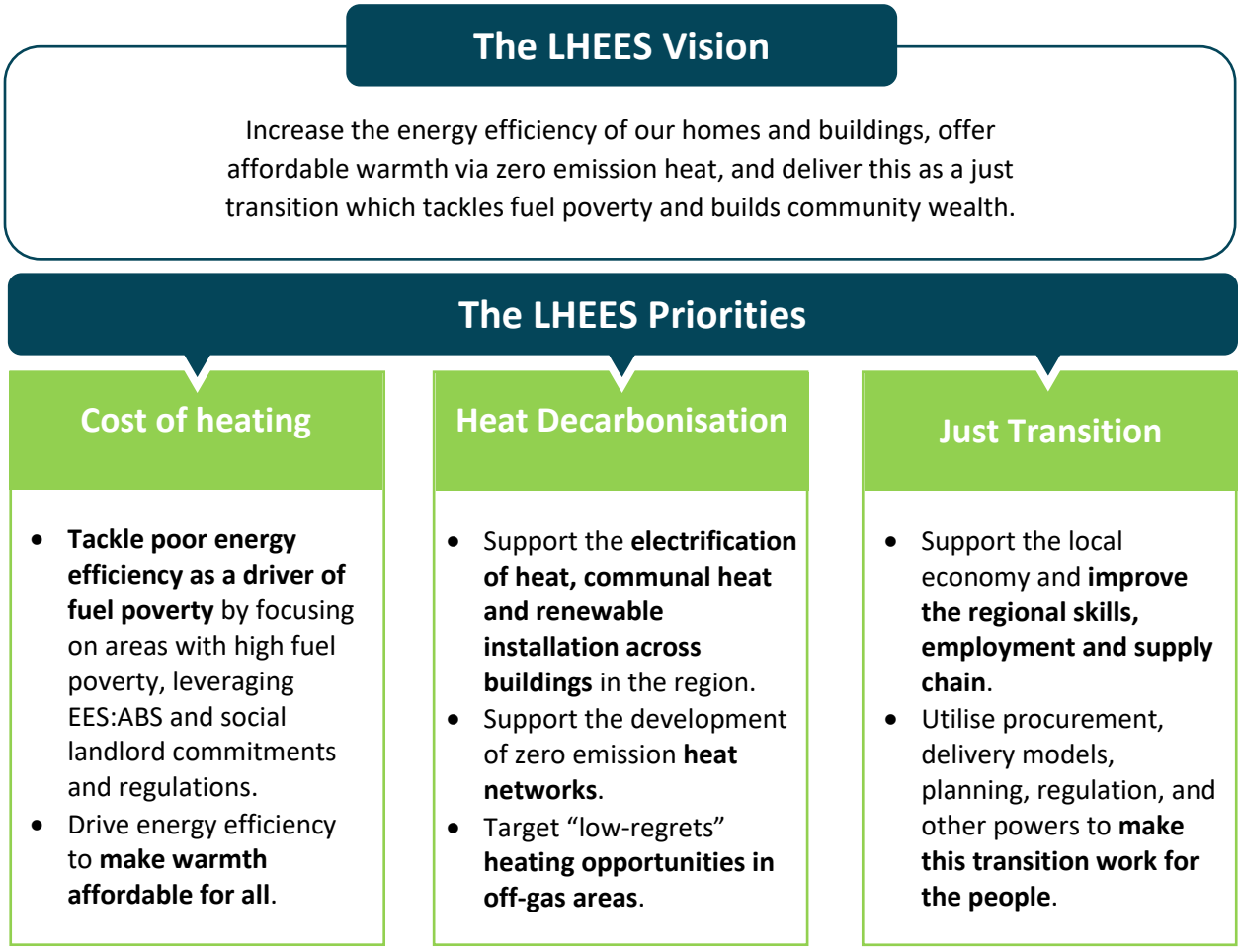
Borderlands Strategic Low Carbon Masterplan (2021) 	The Borderlands Inclusive Growth Deal provides up to £452 million in funding to support a range of activities, including those targeting the low carbon energy transition. The priorities of this strategy include aiming toward a net zero carbon region with a whole systems approach, alongside a focus on stakeholder engagement to motivate and include all groups in discussion and the transition. The LHEES will utilise this as a potential funding opportunity for heat and energy decarbonisation projects.
Edinburgh and Southeast Scotland Regional Prosperity Framework, the City Deal Region, Edinburgh and South East Scotland (2021) 	This framework focuses on the long-term aspirational goals for Edinburgh and the surrounding South East to guide the future direction of regional economic and wider policy across stakeholders. Multiple themes within this framework link to LHEES priorities, such as delivering net zero carbon homes, retrofitting existing homes, ensuring homes are future-proofed and energy efficiency as part of a transition to a net zero economy. This provides an opportunity to link funding and outcome delivery across these policies.
Regional Economic Strategy (2021-2031) 	This strategy sets a vision between 2021-2031 for how the South of Scotland regional Economic Partnership will support the region's economy, focusing on the vision of 'Green, Fair and Flourishing.' One priority includes creating a green and sustainable economy with actions such as a just transition to net zero alongside improving the efficiency of Homes and Buildings. This provides opportunities for, both, the Scottish Borders as well as joint opportunities with other local authorities.

Roadmap to Decarbonisation: Retrofit of Social Housing Stock in the South of Scotland (2022) 	This document explores the potential of social landlords to lead in delivering a just transition in Scotland. Priorities include building on existing collaborative work across social housing and exploring the creation of a collaborative body to facilitate the delivery of retrofit projects within the region.
Newstead Conservation Area Appraisal & Management Plan (2023) 	The Conservation Area Appraisal sets out Newstead's context and historic development, before identifying the elements of its character (such as layout, views, landscape, trees, buildings, structures and spaces) that make it significant. The Management Plan provides guidance on how change can happen in Newstead in a way that preserves and enhances its significant character. This includes guidance to support measures to address climate change. The management plan takes into consideration EV charging points, energy efficiency and renewable energy including heat pumps and solar PVs.
Borderlands Place Programme (2022) 	As part of the Borderlands Place Programme there is a focus on town centres and an ambition that all towns and their centres are economically vibrant and resilient to change. The key objectives are to: • Attract new businesses to our towns and town centres. • Increase and retain our working age population. • Raise the standard of the physical environment in our towns and town centres. • Increase the number of people living in our towns and town centres. • Deliver new jobs and opportunities for economic and social participation. • Increase the number of visitors who spend time and money in our towns and town centres. Towns across the Borders have held workshops and meetings to develop local place plans.

6 The Scottish Borders LHEES Vision

LHEES represents an opportunity for the Scottish Borders to align areas of regional and national focus. The council is committed to working toward a region that is fair for everyone and where all have an equal and positive chance to succeed. Our aim is to provide affordable warmth and healthy homes and buildings in the Scottish Borders whilst contributing to carbon reduction and the transition to renewable heating and energy. Therefore, the council combined the relevant aspects of the above national and local policies to develop an LHEES Vision (Figure 7) which addresses fuel poverty, decarbonisation, and building energy efficiency while contributing to the development of a strong and sustainable local economy, investment in training and support to address the skills gap in delivering a just transition so the benefits of developing a green economy are shared widely.

Figure 7: The Scottish Borders LHEES Vision



The LHEES Vision brings together the relevant outcomes and objects across policies into three priorities tied together by an overall vision statement:

- The negative impacts of the **cost of heating** impacts all residents and organisations in the Scottish Borders. At its worst, it can push individuals, households and communities into fuel poverty and extreme fuel poverty, causing distress, discomfort, ill-health and debt. Living in a cold home can

be damaging to physical and mental health and older people, children and those with disabilities are often at the most risk. The priority for this LHEES is to work collectively with stakeholders, especially social landlords, to improve affordable warmth and energy efficiency in all our homes and buildings. Addressing poor energy efficiency as a driver for fuel poverty is the most important element of this priority.

- The council is committed to making the Scottish Borders a net zero emissions area. The council has declared a climate emergency and developed policies which reinforce this commitment. Several key actions to **decarbonise heat** from our buildings been identified as part of declaring a climate emergency, including:
    - The electrification of heat where the council will work with utility companies alongside SPEN to be mindful of potential strain on the grid.
    - Moving away from reliance on fossil fuels and towards renewable energy generation and heat infrastructure.
    - Promoting measures to help reduce energy use and encourage positive behaviours in how people use energy.
    - Developing an approach to decarbonise the council's own building stock in line with national targets (currently under consultation as part of the Heat in Buildings Bill), providing local leadership by example.
- Another priority of this LHEES is to enable coordination across policy areas to use the delivery of retrofit and decarbonisation projects to go beyond just delivering climate and fuel poverty goals, but to also bolster supply chain development, green skills development and economic development of the region as part of a **just transition**. Success of the LHEES will also be determined by delivering on these economic strategic outcomes and by actions that can build our communities' wealth. This includes providing multiple benefits that reach out to homeowners, businesses, and the wider supply chain. With such momentum and commitment at a national level, the LHEES will need to leverage the energy transition to deliver for people at the local level. The LHEES will build upon the council's partnerships across the region to deliver the LHEES in a way which realises these goals. This will include collaboration with public bodies and local enterprises to channel opportunities appropriately. It will also involve delivering heat network and energy generation projects in a way which prioritises the benefits for local communities.

7 Scottish Borders Progress

A significant amount of activity relevant to the LHEES Vision has been undertaken to date across the Scottish Borders, including programmes to improve the energy efficiency of buildings, reduce fuel poverty, decarbonise buildings and develop heat networks. These are summarised in Table 5 and detailed in following sections. The LHEES will build on these successes first and foremost, using the knowledge and experience gained through these as a launchpad for further activity. A Principle LHEES Officer has been recruited as a dedicated LHEES coordinator to lead the development and delivery of LHEES.

Table 5: A summary of the activities, progress and achievements in relation to the LHEES Vision.

Year	Activities
2017/18	• SBC awarded £1.05m ABS grant funding from Scottish Government. Over 700 private households supported with installing energy efficiency measures on their properties via ABS. • Changeworks in Peebles opened, offering the local community face to face advice and support via a hub on Peebles High Street. • Borders Home Energy Forum established.
2018/19	• Affordable Warmth and Home Energy Efficiency developed with significant engagement. • SBC allocated £1.29m grant funding from Scottish Government for ABS. • Over 2,000 referrals for support via Home Energy Scotland on energy efficiency and fuel poverty. • Changeworks in Peebles continues to operate and has been expanded to cover the whole Tweeddale locality. • Scottish Borders Council has almost 6,000 approved registered landlords and over 8,700 rental properties approved.
2019/20	• SBC allocated £1.34m ABS grant funding from Scottish Government. ABS Air Source Heat Pump installation scheme was developed to support properties in off-gas areas. • 724 referrals for support via Home Energy Scotland energy efficiency and fuel poverty. • Pilot of Missing Shares Scheme initiated in Hawick Conservation Area. This scheme enables essential common repairs to be undertaken to private properties within the town's conservation area where property owners with shared responsibility are unwilling or unable to contribute to their share of the costs. • Landlord Forum held in Galashiels with around 100 landlords/agents attending. • Training course in Tenancy Agreements & Notices for private landlords and letting agents within the Scottish Borders held in Hawick in November 2019.
2020/21	• Scottish Borders Council allocated 1.7m ABS grant funding from Scottish Government. • 5,501 advice interactions with Home Energy Scotland. • Successful joint bid by 4 Scottish Borders RSL's to secure £450k from the Scottish Government's Fuel Poverty Fund. • Online training courses held in conjunction with Landlord Accreditation Scotland (LAS) • Over 300 households supported with energy savings of £300,000. • The council developed the Climate Change Route Map in In June 2021, showing a pathway to climate change resilience and to net zero emissions for the Scottish Borders, over a 25-year time horizon.
2021/2022	• The launch of Scottish Borders Home Energy Forum a catalyst for building collective support for ongoing Strategies including ABS and Energy Efficiency Standard for Social Housing (EESSH) 1 & 2. • Increase in EPC ratings across all tenures and wards. • Insulation levels (cavity wall, solid wall, and loft) have all increased. • Increase in EESSH compliance within Social Housing Sector. • Establishment of Construction Forum to support local supply chain and build on outputs of Home Energy Forum. • Two years extension to the Warm & Well programme offering support advice and income maximisation to Borders households, particularly those in Fuel Poverty. • Increased spend and allocation on ABS and development and introduction of renewable technologies.

7.1 LHEES pilot

Scottish Borders Council participated in the LHEES pilot for Peebles in 2018/19, allowing officers to gain an early understanding of the process involved in developing an LHEES, which has been an essential skill in the development of this region wide LHEES.

7.2 Affordable Warmth and Energy Efficiency Strategy (AWHEES)

The Affordable Warmth and Home Energy Efficiency Strategy (AWHEES)[15] is a multi-agency Strategy designed to support the provision of warm, energy efficient homes for everyone in the Scottish Borders. The Strategy involves key partners within the council, as well as a wide array of stakeholders spanning the full breadth of the energy efficiency and fuel poverty agenda. Covering the period 2019-23, it contains a Vision, Priorities and an Implementation Plan. It was progressed in parallel with the Local Housing Strategy (LHS) and was a core part of the LHS 2017-2022. The AWHEES has generated significant activity and stakeholder engagement, all of which will be used to build the momentum for this LHEES.

7.3 Energy Efficiency Scotland: Area Based Scheme

The Scottish Government provides funding for home energy efficiency improvements via the Energy Efficient Scotland: Area Based Scheme (ABS)[16]. The funding enables local authorities to invest in external and internal wall insulation, cavity wall insulation, loft insulation, and underfloor insulation. As well as supporting insulation and fabric first measures, the scheme also aims to deliver renewable technology, such as air source heat pumps, solar PV and battery storage systems.

7.4 Fuel poverty

There has been a considerable amount of ongoing works by the council and partners to mitigate the impacts of the cost-of-living crisis with a dedicated webpage offering access to a wide-ranging information and advice (financial support and advice[17], help with rising energy costs[18] and help with access to food). The council has been working with community and voluntary groups to create a network of Warm Spaces throughout the region, resulting in the Warm Spaces Initiative where community centres, libraries and clubs offer a warm and welcoming space, free to anyone struggling to heat their home.

7.5 Borders Home Energy Forum

The Borders Home Energy Forum was established in March 2018 to ensure that a strategic, multiagency approach is taken to help reduce fuel poverty, improve energy efficiency, and improve health and well-being in the Scottish Borders. The Forum comprises of organisations representing housing providers, statutory bodies, advisory groups, bodies associated with energy, affordable warmth, health and income maximisation, and representative officers of the council. The forum has helped progress core priorities, including:

- Increase in EPC ratings across all tenures and wards.
- Increased insulation levels (cavity wall, solid wall, and loft).
- Increase in EESSH compliance within the social housing sector.
- Establishment of the Construction Forum to support the local supply chain and build on outputs of Home Energy Forum.

[15] Affordable Warmth and Home Energy Efficiency Strategy, Scottish Borders Council (link)
[16] Energy Efficient Scotland Area Based Schemes (EES:ABS), Scottish Government (link)
[17] Scottish Borders Council, Financial support and advice (link)
[18] Scottish Borders Council, Help with rising energy costs (link)

- Two years' extension to the Warm & Well programme providing support advice and income maximisation to Scottish Borders households, particularly those in fuel poverty.
- Increased spend and allocation on ABS.
- Development and introduction of renewable technologies into ABS.

7.6 Improvement in EPC ratings

Since the previous Local Housing Strategy (LHS) (2017-2023) there have been consistent improvements made in average EPC ratings, shown in the table below. The improvements are in line with EPC improvements required by the Energy Efficiency Standards for Social Housing regulations - EESSH 1 & 2. These improvements have been driven by ABS and Warmer Homes Scotland schemes providing funds to support homeowners in implementing energy efficiency measures.

The private rented sector has seen the lowest increase in EPC ratings. ABS is available to some private landlords in addition to Energy Saving Trust loans. Delayed Minimum Energy Efficiency Standards may have slowed improvements, although the ongoing consultation on the Heat in Buildings Bill is proposing new ambitious standards for improving the energy efficiency of private homes.

Table 6: Average EPC ratings within the Scottish Borders area

Averages - EPC C or higher[19]	2018	2023	Increase
Owner Occupied	24%	30%	+6%
Social Housing	42%	72%	+30%
Private Rented	19%	22%	+3%

7.7 Warm and Well Borders project

The council secured two years of funding worth £551,000 from the National Grid's Warm Homes Fund to deliver the "Warm and Well Borders" project. The scheme was able to support 771 households and resulted in savings of £1.2 million for households across the region. This project has been extended for another 24 months in a revised delivery model, delivered by the regional Citizens Advice office in the Borders with support from the council via the Cost of Living Fund. In this revised format, the project has supported 628 clients, putting £2,394,960 of client financial gains and realised benefits back into the Scottish Borders, and provide energy advice and advocacy as well as referring households onto appropriate agencies such as Home Energy Scotland, Warm Homes Scotland and Changeworks. The project has also discharged £10,000 of discretionary funds for urgent cases.

7.8 Supply chain

To effectively deliver LHEES, a sustained development of the national and local supply chains is required. The council has a provision to support the growth of and trainings in the manufacturing sector and is already working with Borders College and South of Scotland Enterprise and other local stakeholders to explore how this activity can be supported. Additionally, the council is engaging with the Borders Construction Forum to share opportunities and insight.

[19] Home Analytics v3.8 (February 2023)

8 Local Area Profile and Baseline

8.1 Demographics

The Scottish Borders is a medium-sized council area in terms of population though with a much larger than average geographical area when compared to other Scottish local authorities, giving it a unique set of challenges. As of 2021, the population of the Scottish Borders was 116,020 and increasing, through with population loss in certain towns and villages, especially in the younger age range (16–24-year-olds). The number of births within the area has been steadily declining since 2001 therefore the trajectory seems to be that in the future there will be a high proportion of older people who are financially and physically dependent on an unequal number of working aged people. The council's population forecast is that population will increase but with a larger proportion of pensioners, number of children stabilising, and the working age cohort population dropping. Therefore, the population of vulnerable people living in the area will increase, potentially resulting in resource issues in the future.

The current population is spread across 4723 sq. km, making the SBC the fourth most sparsely populated area in Scotland. Of the total population, 48% are living in rural areas, 27% in a small town and the remaining population is in various urban areas (there are no 'large urban areas' within the Scottish Borders). These statistics vary significantly from the Scottish average, meaning the Scottish Borders will have varying risks to mitigate and considerations around the implementation of their LHEES including supply chain constraints, a vulnerable older population, loss of young talent, a diverse range of stakeholders spread across a large area, grid-related challenges, and barriers to achieving economies of scale and cost-effective solutions. The 2020 SIMD shows that 6% (9 of 143) data zones in the Scottish Borders are within the 20% most deprived of all of Scotland. A further 17% (24 of 143) of the data zones in the Scottish Borders are amongst the 21-40% most deprived in Scotland. Poverty-stricken areas will be prioritised to ensure the council is targeting its resources for vulnerable residents.

8.2 Domestic housing stock baseline

There are 62,296 properties within the Scottish Borders. Of these, 61,369 (88.4%) are domestic properties, 5% of which are listed buildings and 16% are located within conservation areas. The majority of domestic properties (74%) were built before 1984, close to the national average of 70%. Of all domestic properties, 57% are either detached, semi-detached or mid terrace houses, and 32% are flats, lower than the national average of 40% (see Figure 8).

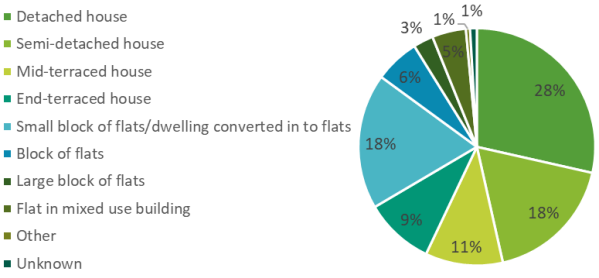


Figure 8: Domestic property types

Since domestic properties constitute a significant proportion of Scottish Borders building stock, they have been established as a priority for the LHEES. This has also been carefully considered in the council's new Local Housing Strategy 2023-2028. The LHS vision was developed jointly with stakeholders and is: "Everyone in the Scottish Borders has access to a home that meets their needs and is part of a sustainable community". In order to deliver this vision successfully and contribute to the LHEES, the strategic outcome three (of five) was defined as: improved energy efficiency of homes and a reduction in fuel poverty while supporting a Just Transition to Net Zero through decarbonising domestic heating and energy. Many of the identified actions in the LHS Action plan in relation to Strategic Outcome 3 have been supported and considered in the LHEES and Delivery Plan.

Houses and flats both have their opportunities and challenges to retrofit and decarbonise. Houses may require larger investments and might present a challenge in terms of generating demand at scale when compared with flats. However, compared to flats they do not require engagement with individual owners/tenants for approval from multiple decision-makers. This is because it is a simpler challenge to engage and agree with individual owners to plan for interventions, compared to facilitating agreement of retrofit from majority flat owners. Of 61,369 domestic properties 7,500 are in buildings with mixed tenures and 928 are of unknown tenure type.

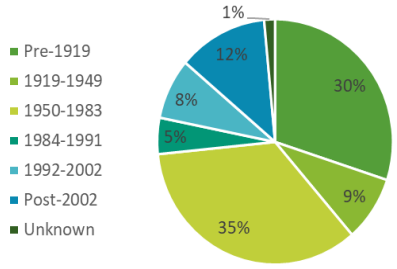


Figure 9: Domestic property ages

The domestic stock within Scottish Borders mostly precedes 1983 construction; 74% of the properties are from 1984 or prior, with 35% being built in the mid decades of the 20th century and 30% from before 1919 (Figure 9). This presents a challenge in terms of energy efficiency since old homes tend to be less energy efficient, particularly where they have been poorly maintained. These homes also require solutions which are compatible with their construction type. The majority (60%) of the domestic stock have EPCs between D and G, highlighting a large potential area of improvement (Figure 10). Two-thirds of domestic properties have walls that are not sufficiently insulated, and many of these may be difficult or impossible to insulate (Figure 11). Although a large proportion (86%) of buildings already have at least double glazing.

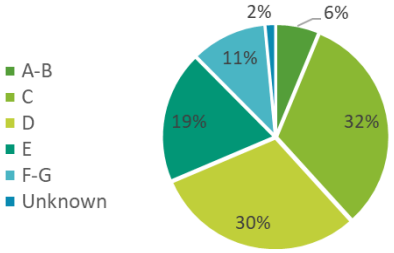


Figure 10: Domestic EPC bands

Over 21% of the domestic properties within the Scottish Borders are listed buildings or within conservation areas. It will be important to consider the possible energy efficiency measures through following the fabric first approach on traditional constructions, practically achievable efficiency and costs in relation to the benefits when planning and delivering projects concerning these properties.

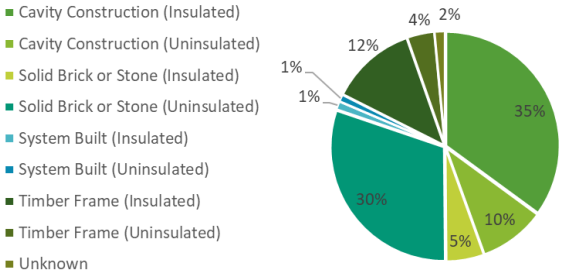


Figure 11: Wall construction & insulation

As discussed in section 4.1, according to the most recent 2019 data 29% of households in the Scottish Borders are fuel poor, and this number is likely much higher due to the ongoing cost of living crisis. Poor building energy efficiency is a major factor in driving fuel poverty. It causes or exacerbates fuel poverty through a number of factors in the Scottish Borders:

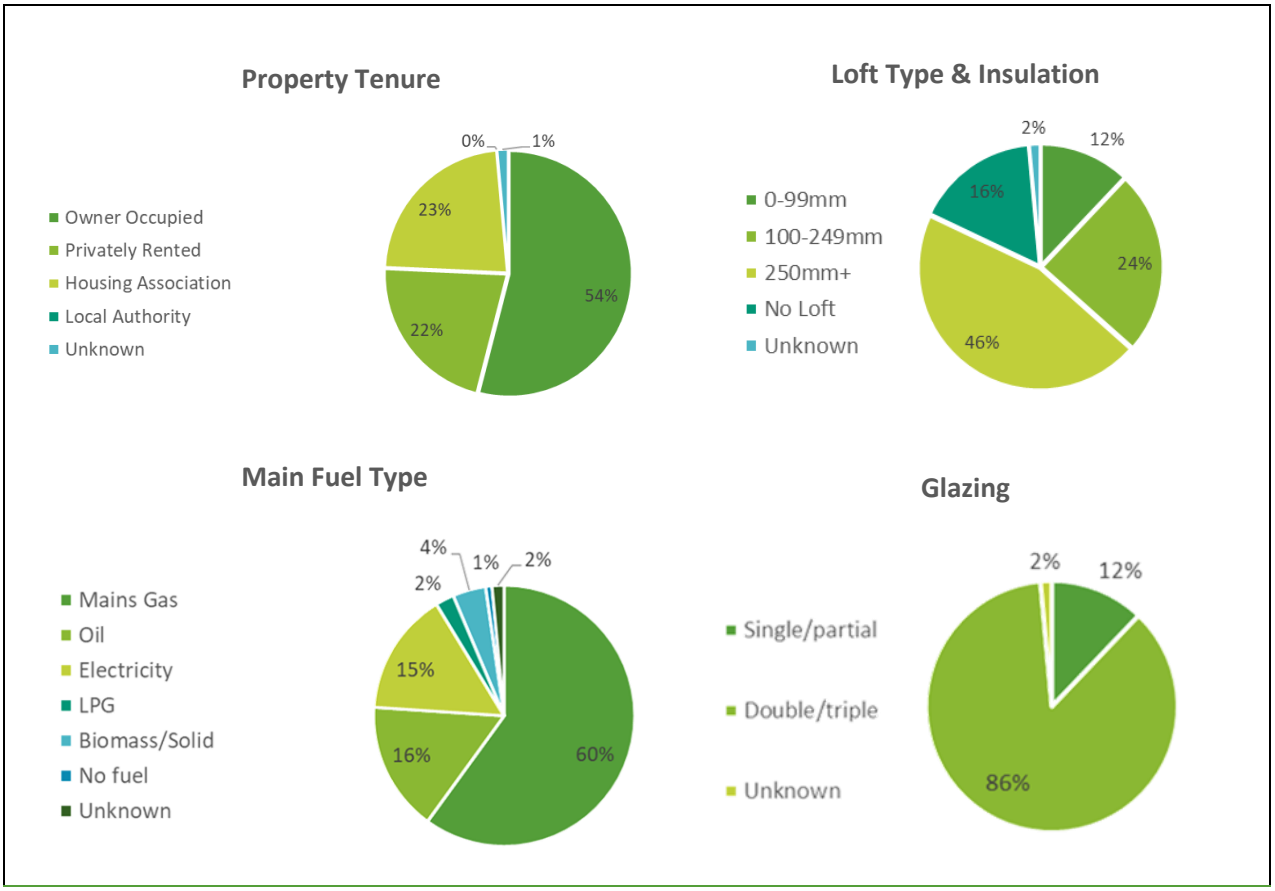
- 11% of dwellings in Scottish Borders have an F or G EPC rating, 19% have an E rating and 30% have a D rating. Altogether this 60% of the domestic stock has a lower than reasonable level of energy efficiency.
- 33% of dwellings in Scottish Borders were built before 1945.
- 35% of Scottish Borders dwellings are off the gas grid[20] meaning they must use other means of more expensive heating, largely oil and direct electric heating.
- The Scottish Borders has a lower wage economy.

[20] Energy Saving Trust - Home Analytics Scotland V3.8

- 48% of the population in the Scottish Borders live in rural areas.

A visual summary of additional statistics relating to the domestic building stock is provided in Figure 12.

Figure 12: Additional statistics summarising the domestic stock.



8.3 Non-domestic stock baseline

There are 8,090 non-domestic buildings within the Scottish Borders. Of these, 3,500 are retail, 1,250 are offices, and the remaining are split between various types of buildings such as the cafes/restaurants, education, industry, storage/distribution and clubs and community centres. The majority of non-domestic buildings (66%) were built pre-1949, 9% were built between the years of 1949-1983, and 25% were built post 1983. This means the majority are older and less efficient properties unlikely to be the most cost-effective option for the organisations using them. Almost 80% of the non-domestic buildings are located either in an urban area or a well-connected accessible area which presents an opportunity for planning and delivering retrofit interventions at scale (Figure 15). Currently, 59% of the non-domestic buildings are already using electricity as the main source of energy meaning they are already connected to the grid as a route of decarbonisation (Figure 15). There is limited performance data for non-domestic buildings due to the very low percentage of EPCs.

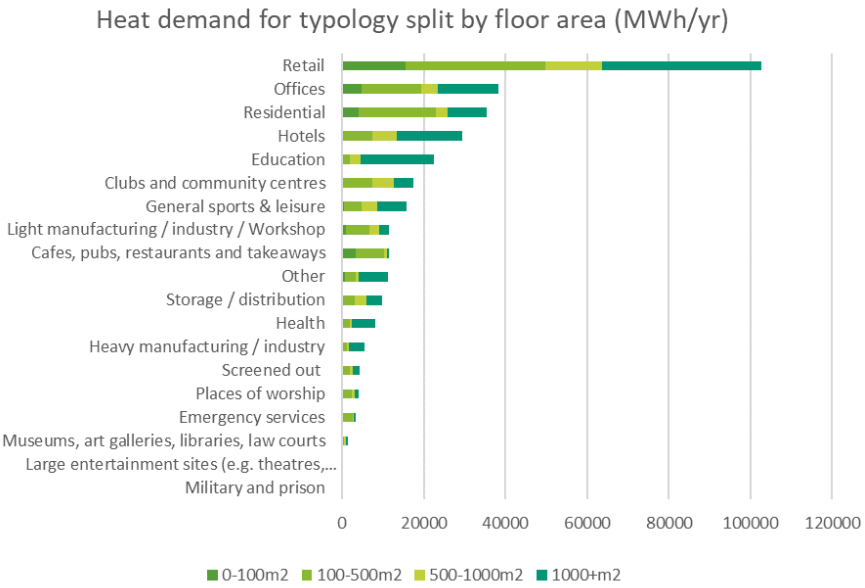


Figure 13: Non-domestic property heat demand by use type

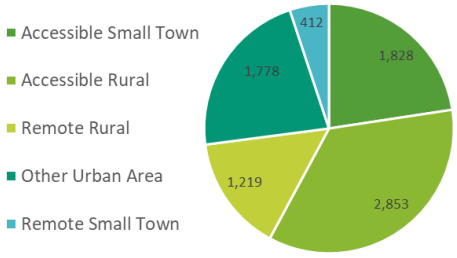


Figure 15: Non-domestic property locations

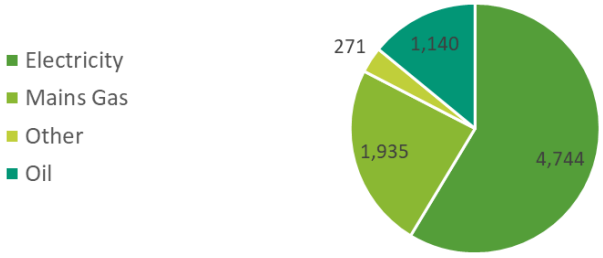


Figure 15: Non-domestic properties by fuel type

9 Strategic Zones and Pathways

One of the key steps in developing the LHEES was mapping the data from the preceding two sections to develop and understanding of how the council will target and prioritise. In essence, this was done to understand what approach needs to be taken in each area and where the priority areas are. This mapping was done through the lens of the LHEES Considerations (as discussed in section 3.1.2) to develop a set of 'strategic zones'. Strategic zones provide an overview of the key challenges and opportunities across the region. The subsequent sections present results of this zoning in relation to two priorities[21] of the LHEES Vision:

- Cost of Heating (section 9.1)
- Heat Decarbonisation
    - Building Level (section 9.2)
    - Heat Networks (section 9.3)

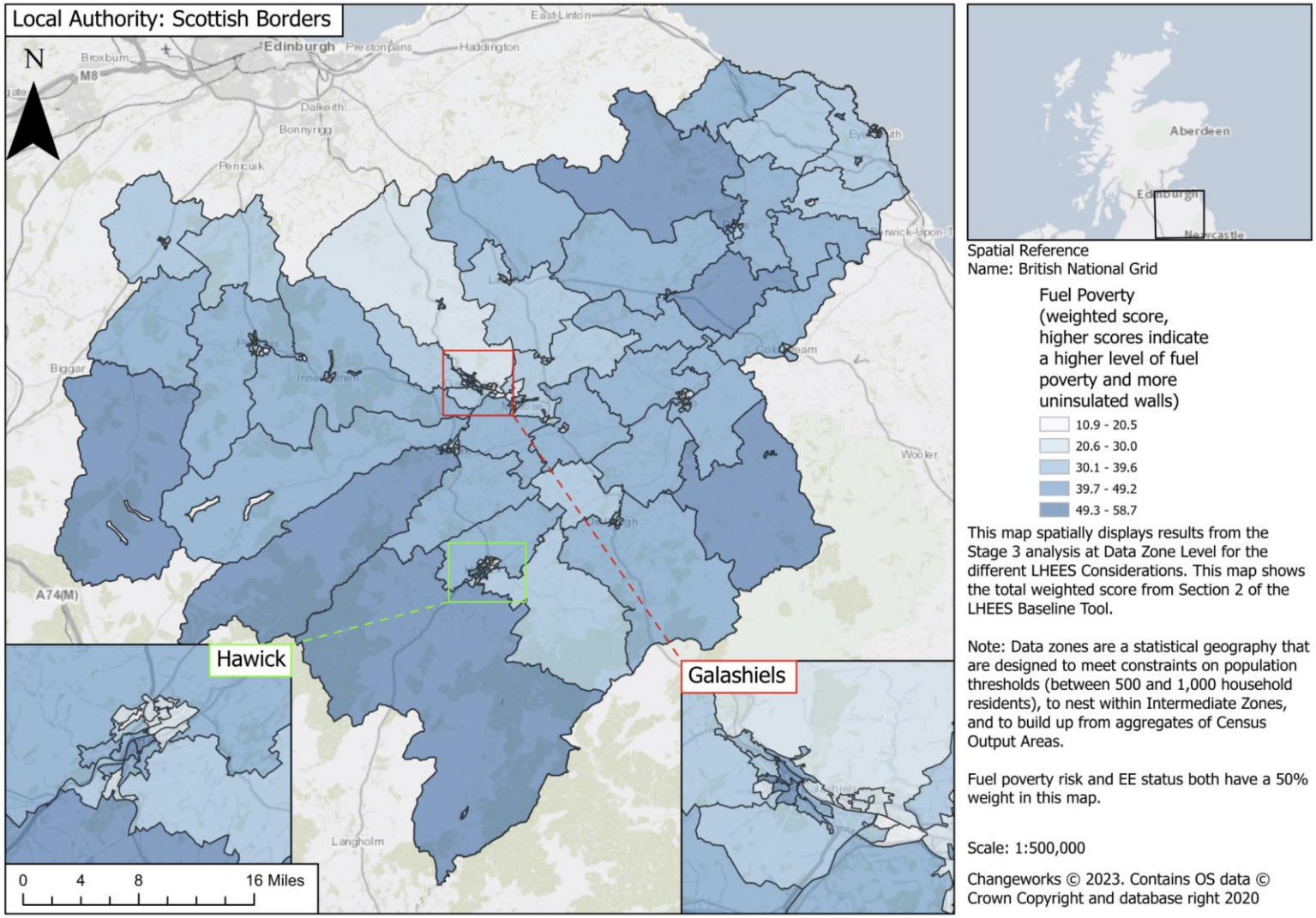
These strategic zones provide the understanding and basis for developing delivery areas and building-level pathways, which define what needs to be done to each property in these areas to bring it to a good level of energy efficiency and zero emission heating. The zones help prioritise where the council should focus its efforts and how it should approach each area. They help programme where initial efforts should be focused, leading to formation of delivery areas. Strategic Zones provide a high-level guide for priorities whereas delivery areas are shorter term ~5 years and are guided by the priorities set out in the Strategic Zones. The delivery areas identified through this method are defined in the Delivery Plan.

9.1 Cost of Heating

As part of the cost of heating priority, tackling, and eliminating poor energy efficiency as a driver of fuel poverty is a paramount objective of the council. As such, data was analysed to understand areas with the greatest number of properties which are low energy efficiency (identified with insulation data) and have a high indication of fuel poverty to find those struggling most with their heating bills. Figure 16 provides the geographic summary of these areas. As part of this LHEES, these 'at risk' areas will be a focus for the ABS programme, local and national fuel poverty schemes, and other initiatives A core consideration that will be reviewed throughout the implementation of the LHEES will be the effects on consumers' household costs. Whilst the typical households and businesses in the area are currently exposed to price changes for gas and electricity, local generation opportunities for the future will be continually considered alongside mitigations such as energy efficiency measures and reducing the use of energy to protect consumers.

[21] The third priority of Just Transition is not a building or heat decarbonisation action but rather the way in which these projects should be carried out. Thus, it is not something which could be mapped as a Strategic Zone. This priority is instead discussed in the Delivery Plan.

Figure 16: Areas with high indication of fuel poverty and more uninsulated walls.



9.2 Heat Decarbonisation: Building Level

This section discusses the properties with heat pump installation as the appropriate decarbonisation route. The LHEES Methodology provides a way to organise the heat decarbonisation pathways of each property based on the level of intervention:

- 'Heat-pump ready' properties (also known as 'Category 1'): they typically have a good level of energy efficiency and are either ready for a heat pump or could be made so with a relatively non-disruptive measure (e.g. loft insultation). They have wall insulation, are not listed or in a conservation area and do not have a communal main heating system.
- 'Energy Efficiency' properties (also known as 'Category 2'): these properties do not have a good level of energy efficiency and their standard should improve before a heat pump or communal heating system is installed. For example, they need cavity wall insultation. They may already have a communal main heating system and if they have cavity construction walls there is usually not a risk of them being narrow cavity walls which are difficult to adequately insulate.

The data was analysed to map these properties based on whether they were on-gas grid or off-gas grid to provide further granular information about their existing fuel type. This selection of strategic zones was made with a view to installing the following measures in addition to heat pumps and communal heating systems, where possible:

- Wall insulation
- Loft insulation
- Single glazing
- Solar PV suitability

The following figures display the density of heat pump ready and energy efficiency buildings which are, both, on gas and off gas. These areas will help guide the development of delivery area projects. In total, 20 Delivery Areas are listed and mapped in the delivery plan.

The council will continue to tailor their approach for rural communities who have varying heat sources. The council will consider appropriate measures for those who are off gas grid. One of the main considerations for this LHEES is to ensure these types of communities will be offered early potential to move from systems utilising oil and LPG to enhanced electrical heating. Many of these communities have been identified via Potential Delivery Areas.

To ensure the council takes a balanced approach to providing low-cost heating to residents across the Scottish Borders, this LHEES also investigated the potential for communal heating systems. Communal heating is an attractive route to ensure rural areas of the Scottish Borders benefit from lower cost heat where there is the potential, allowing the council to support heat decarbonisation at a greater scale than individual heat pump installations. Where communal systems present a feasibility to be more cost effective for property occupiers, they may also be a larger, more attractive business opportunity for installers, also reducing the cost of installation. The Home Analytics data indicates that 912 properties in the Scottish Borders already have communal heating as their primary heating. The council conducted further analysis matching energy and heat use with building types to identify potential communal heating opportunities across the Scottish Borders and mapped these to the selected delivery areas. This analysis was fruitful and resulted in multiple hotspots across the delivery areas, including in rural and urban areas.

Figure 17: Map showing density of On Gas Grid heat pump ready dwellings within the Scottish Borders.

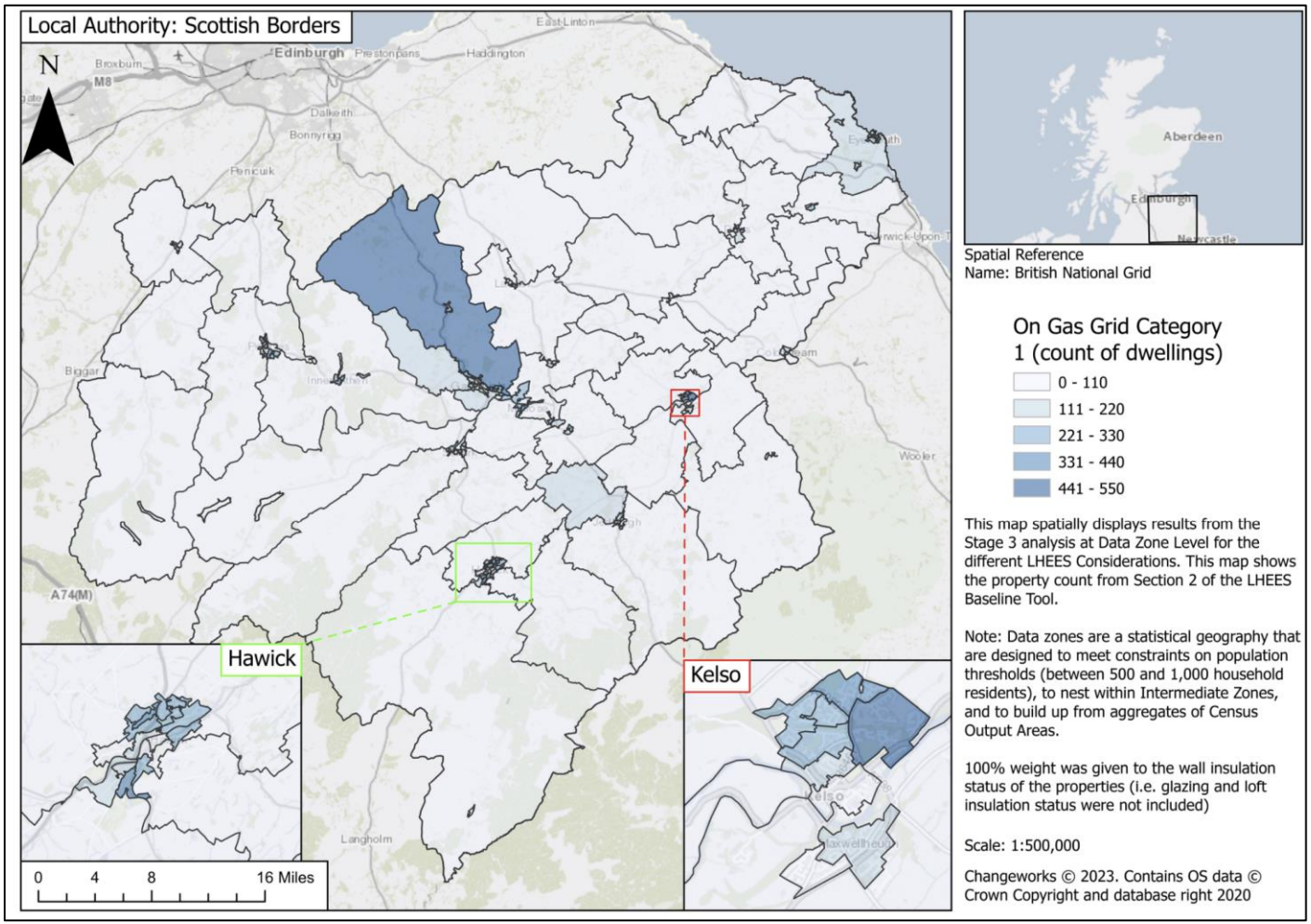


Figure 18: Map showing density of On Gas Grid energy efficiency dwellings within the Scottish Borders.

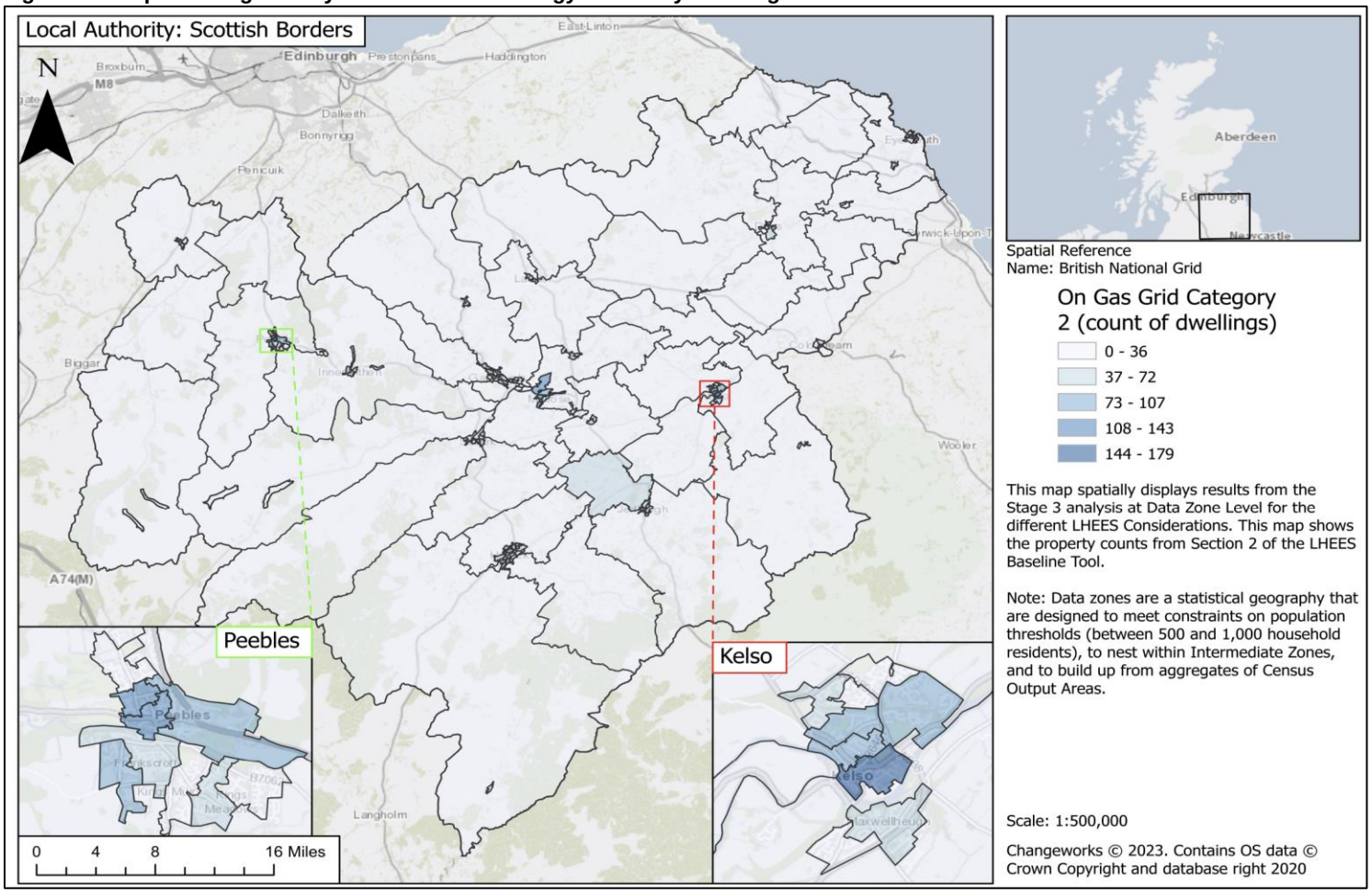


Figure 19: Map showing density of Off Gas Grid heat pump ready dwellings within the Scottish Borders.

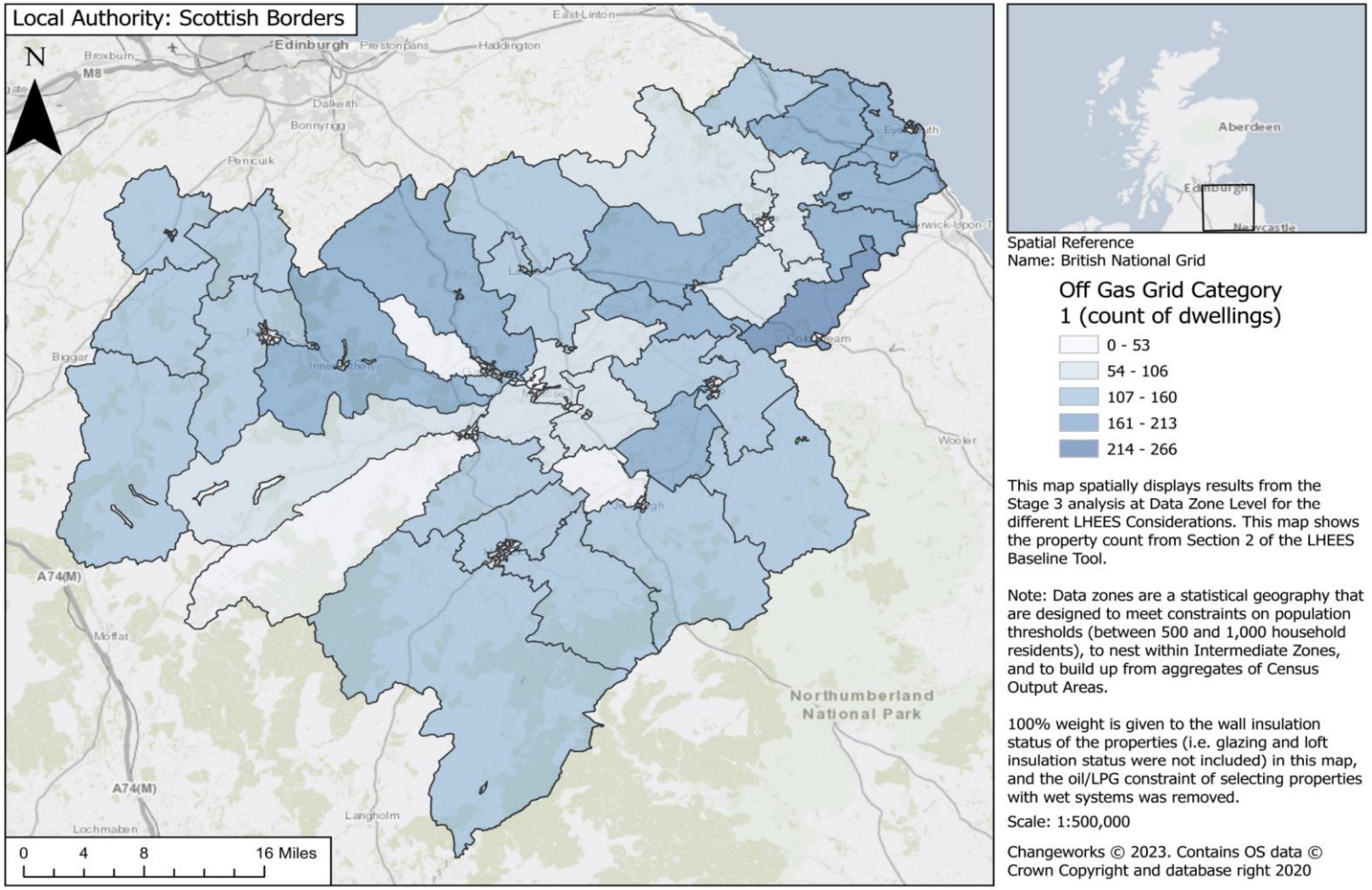
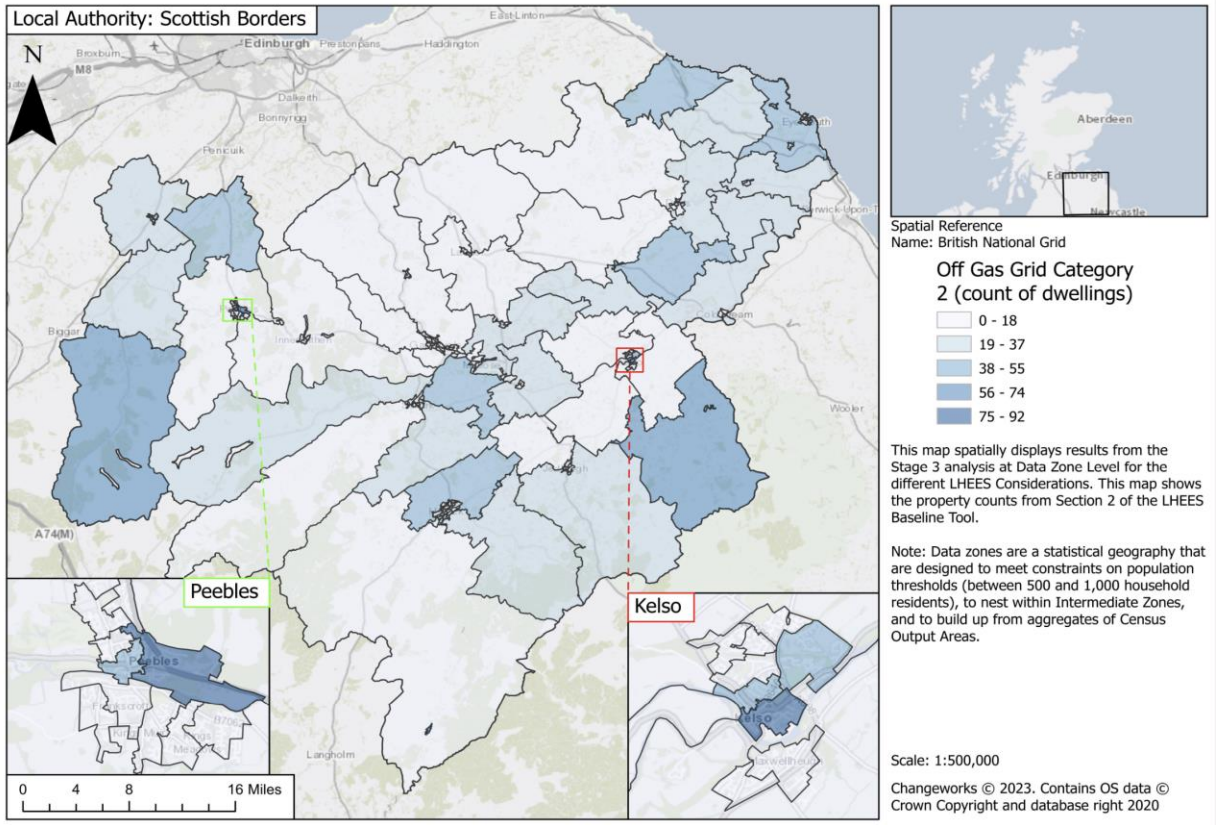


Figure 20: Map showing the density of Off Gas Grid energy efficiency dwellings within the Scottish Borders.



9.3 Heat Decarbonisation: Heat Networks

All Scottish local authorities are required through the Heat Networks (Scotland) Act 2021 to identify potential areas or opportunity zones for Heat Networks to help meet the national targets. Heat Networks are more efficient and viable in energy dense areas with high numbers of properties in close proximity that can be served by the network. Larger energy users (anchor loads) can also be critical to help balance and sustain the network. The council is already assessing heat network opportunities at Tweedbank (a new development) and Croft Street, Galashiels (existing buildings with potential for sufficient heat demand).

Through this LHEES, the council has carried out a detailed investigation, and generated up to 28 potential heat network zones organised into 18 clusters across the Borders. These clusters are present across most sizeable populations across the Borders. To organise these opportunities, we used a tiered system with three levels of opportunities to distinguish their respective potential and timelines:

- **'Potential core zones'** have significant demand and are likely economically and practically viable for a heat network at present.
- **'Potential wider zones'** may present viability either now or in the in the near future, and may become more attractive when the core zones that they are identified as extensions to deploy heat networks.
- **'Potential future zones'** are areas contingent on proposed and potential developments coming to fruition and, as a result, generating new suitably dense heat demand suited to a heat network.

All zones are presented in the Delivery Plan.

Through ongoing work on this LHEES, the council will take steps to assess feasibility and progress the development of these opportunities. Alongside identifying heat network sites, the council will pursue feasibility studies and development of business cases to encourage investment, given the Scottish Government continues to provide support through its heat network funding initiatives.

According to the First National Assessment Report on Heat Network Potential[22], areas with the highest potential in Scotland are large and mid-size urban areas, while properties located in small rural settlements or remote locations account for less than ten percent of the potential properties which could be connected to a heat network. These types of properties, however, account for over two-thirds of the domestic properties within Scottish Borders. There are local limits on large-scale and interconnected heat networks due to the rurality, sparse population and limited suitably dense areas. As such, it is likely that the only viable large-scale heat networks in the Scottish Borders will be in the larger towns and new build developments.

[22] Potential heat network zones: first national assessment, Scottish Government, 2022 (link)

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